


Applying of Scientific Approach on the Result of Learning Natural Science at State Elementary School 1 Segalamider Bandar Lampung

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Abstract

The main problem of this study was low learning outcomes of Natural Science that obtained by students at state elementary school 1 Segalamider Bandar Lampung. This article analyzed the effect of the Scientific Approach on students' learning outcomes of natural science. The sample of this research was 27 students. The analysis used is the Hypothesis Test using the Dependent Sample T-test, namely Paired Sample T-test (Paired Sample T-Test). The results of this study indicated that the hypothesis testing results obtained by $t_{count} > t_{table}$, namely t account of 7,834 with t table of 2,056. With a significant level of 0.05 or 5%, which means that H_a is accepted and H_0 is rejected. This means that the scientific approach has an effect on the learning outcomes of class V SD Negeri 1 Segalamider Bandar Lampung.

Keywords: Scientific Approach, Learning Outcomes, Learning Natural Science

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INTRODUCTION

Education has a very important role and cannot be separated from human life. The purpose of national education according to Article 3, Law Number 20 of 2003 concerning the National Education System is to educate the nation's life and develop Indonesian people as a whole, namely humans who believe and fear God Almighty and have noble character, have knowledge and reason, skills, physical and spiritual health, a strong and independent personality, and social and national responsibility (Mikarsa, Taufik, and Prianto, 2007). Education is concerned with learning and learning. Also in (Ghufron and Risnawita, 2013) argues that learning is a relatively permanent stage of individual behavior change as a result of individual experiences and interactions with the environment. In contrast to learning, Dimiyati & Mudjiono in (Saifuddin, 2014), explain that learning is a teacher activity programmed in instructional design, to make students learn actively, which emphasizes the provision of learning resources. The 2013 curriculum provides flexibility for schools and educators to design, develop, and implement the curriculum according to the situation, conditions, and potential for local advantages that can be raised by schools, educators are free to carry out the learning process according to the circumstances of the school situation and the circumstances of

students. According to Permendikbud Number 65 of 2013 concerning Standards for Primary and Secondary Education, it states that the learning process in the 2013 Curriculum for all levels is carried out by applying a scientific or scientific approach combined with integrated thematic learning.

One approach that has been considered student-centered is the *scientific approach*. Permendikbud Number 65 of 2013 concerning Standards for the Primary and Secondary Education Process has indicated the need for a learning process that is guided by the principles of a scientific or scientific approach. The 2013 Ministry of Education and Culture also provides its own conception that the *scientific approach* in learning includes components: observing, asking, reasoning, trying or creating, presenting or communicating.

Based on the attachment of the Minister of National Education Number 22 of 2006 concerning Content Standards for SD or MI, it is explained that Natural Science is a subject that deals with how to find out about nature systematically, so that the subject of Natural Sciences is not only the mastery of a collection of knowledge in the form of facts, concepts or principles, but also a process of discovery. It is clear that learning Natural Sciences should be done by inviting students to be active.

Based on the results of the Pre-Survey of learning conducted at SD Negeri 1 Malamider, an observation was made on the implementation of the learning process in Class V (Five) and it was found that the learning process in the class was not in accordance with the lesson plan (RPP) made by the educator. Learning still tends to be dominantly centered on students, this results in the use of the scientific approach not being optimal and it is suspected that the learning outcomes of students are still lacking.

Table 1. Student Value Data

NO	VALUE	CYCLE I		KET
		F (frequency)	PERCENTAGE (%)	
1	50	2	7.40 %	Uncompleted
2	52	2	7.40 %	Uncompleted
3	55	4	14.81 % Uncompleted	4
60	3	11.11	%	Uncompleted
5	62	3	11.11 %	Completed
6	63	2	7.40 %	Uncompleted
7	65	1	3.70 %	Completed
8	70	3	11.11 %	Completed
9	72	2	7.40 %	Completed
10	78	2	7.40 %	Completed
11	80	2	7.40 %	Completed
12	87	1	3.70 %	Completed
TOTAL		27	100%	-

The low UTS scores of class V students in Natural Sciences may occur because students' learning activities are still very lacking or in other words they still rarely provide opportunities for students to make observations or experiments. Students are often crammed with concepts without any process to find the concept. In fact, learning will be more meaningful if students participate in finding their own concepts that are learned through a process. Learning like this usually often results in students being less motivated to take part in learning.

Therefore, a solution to the problem is needed in the form of a learning approach that gives students the opportunity to construct their own knowledge and develop learning outcomes. One of the learning approaches is the scientific approach.

Hosnan (2014), the scientific approach itself is a process designed in such a way that students can actively construct concepts, laws or principles through the stages of observing, formulating problems, formulating hypotheses, collecting data, analyzing data, drawing conclusions, and communicating concepts. Therefore, the purpose of this study is to determine the effect of the scientific approach on natural science learning outcomes for fifth grade students at SD Negeri 1 Kaliandi, Bandar Lampung

METHODS

This research is a quantitative study, because the data obtained are in the form of numbers and analyzed using statistics and the type of research used in this research is an influence study. In this study, the researcher used the "*One Group Pretest-Posttest Design*" design. The population in this study were all fifth grade students of SD Negeri 1 Malamider for the 2019/2020 academic year, totaling 110 students. Meanwhile, in this sampling, the researcher took 1 class with a total of 27 students. This research procedure consists of three stages, namely the preparation stage, the implementation stage, and the data processing stage. The independent variable in this study is a scientific approach, and the dependent variable in this study is the natural science learning outcomes of class V students. Data collection in this study includes data on students' natural science learning outcomes. Data collection activities were carried out on fifth grade students of SD Negeri 1 Bandar Lampung in the 2019/2020 academic year. Data collection techniques used in this study were tests, observations, and documentation. Meanwhile, the research instrument used by the researcher includes a test of learning outcomes made in the form of multiple choice with a total of 50 questions. Before analyzing the data, the researcher first tested the research instrument. The research instrument test used by the researcher is the Validity Test, Reliability Test, Difficulty Level Test, and Differential Power Test. After testing the research instrument, the next step is to do the Data Analysis Prerequisite Test. The prerequisite test for data analysis was carried out using the Normality Test, normality test, homogeneity test, and hypothesis testing. The normality test is used to determine whether the research data used is normally distributed or not, the homogeneity test aims to determine whether the sample class used has homogeneous variations or not, while the hypothesis test is used to determine whether there are differences in the two paired samples, the two samples in question. are the same sample but different data.

RESULTS AND DISCUSSION

Before the instrument is tested on the sample, the instrument must meet the validity, reliability, discriminating power of the questions, and the level of difficulty of the questions. Therefore, an analysis is carried out first on the questions to be tested.

The first step in this research is to do a validity test. In conducting the validity test, the researcher used the product moment correlation formula based on Arikunto's book (2014), with a significant level of 5%. Based on the 25 questions made by the researcher, there were 5 questions that were dropped or said to be invalid. So that only 20 items can be used as test instruments by researchers.

After passing the validity test stage, the next step is reliability testing. This test is carried out so that if the data is in accordance with reality, the number of times it is taken will remain the same. The reliability test used by the researcher was using the *Spearman Brown*, with the conclusion that the reliability value obtained was 0.903 and entered very high criteria when viewed from the reliability criteria table in Sugiyono's book (2015).

Not only until the validity and reliability tests, the researchers then carried out the level of difficulty test and the test of differentiating power of the questions. To test the level of difficulty, the researcher used the *Microsoft Office Excel* in the process.

After the data is collected from the research results, the next step is to analyze the data. Researchers use statistical analysis to analyze research data, therefore the data that researchers collect is quantitative data or data in the form of numbers achieved from the results of giving tests from each research respondent. The data in this study is the score of students' learning outcomes in Natural Science subjects. The description of the data from the results of this study consisted of a description of the data from the *pretest* and *posttest*.

Table 2. Recapitulation of the Calculation of Students' Science Learning Outcomes Scores

Statistics Variables	<i>Pretest</i>	<i>Posttest</i>
Amount of Data (n)	27	27
Mean	65	85,37
Median	70	90
Mode	80	90
Std. Deviation	23.20	12.24
Highest score	100	100
Lowest score	5	50

From the data on the students' learning outcomes before (*thepretest*) taking learning with the Scientific approach, it obtained a lot of data $n = 27$, average = 65, maximum score = 100, minimum score = 5 and standard deviation = 23.20. While the data on student learning outcomes after (*posttest*) following learning with a scientific approach obtained data such as a lot of data $n = 27$, average = 85.37, maximum score = 100, minimum score = 50 and standard deviation = 12.24.

To test the hypothesis, a statistical formula is used which is only valid if the data comes from a normally distributed population. The normality test was used to determine whether the research data had normal distribution or not. The statistical test used to test the normality of the data is the *Chi Square* test, the normality test is also carried out on the learning outcomes data, namely before and after. The normality test of the data was carried out using Chi Square at a significance level of $\alpha = 0.05$. Based on the statistical test, the *pretest* was -65.32 and the *posttest* was -58.51. $\text{values}^2_{\text{calculated}} < X^2_{\text{tables}} = 7.81$. learning outcomes *pretest* and *posttest* are normally distributed.

The homogeneity of variance test was carried out on the learning outcomes data between the *pretest* and *posttest*. This test is carried out to determine whether the classes in the sample have the same variance or not. Based on the calculation results, it is concluded that $F_{\text{count}} = 1.85 < F_{\text{table}} = 4.23$ this indicates that the sample is homogeneous for H_0 is accepted and H_a is rejected.

After the normality test and homogeneity test were carried out, the next step was to test the hypothesis. In this study, researchers used the *dependent sample T-test* or Paired Sample T-test. To find out the hypothesis in this study, the researcher used the help of the *Microsoft Office Excel* application. Based on the results of the Hypothesis Test using the statistical formula, namely T-test, the results obtained were $t_{\text{count}} > t_{\text{table}} (7.834 > 2.056)$. This means that H_0 is rejected and H_a is class V.

This research was line with some scholar, who found that learning by using scientific method or scientific approach is capable of creating an atmosphere of active learning, and can make students more creative and innovative thinking in the face of the material being taught (Setiawan & Wilujeng 2016; WATI, Bharati & Hartono 2014). Nagl, Obadovic & Segedinac (2012), Susilo, Siswandari & Bandi. (2016) and Sodik & Wijaya (2017) also revealed the learning scientific methods can make the atmosphere becomes monotonous learning atmosphere that is very interesting, because the student is presented with the material reality and the facts that exist around the them so that i is able to increase the motivation of students to find out more. A more scientific approach engaging students in activities directly and help them associate academic learning with real-life contexts they face. By hooking the lessons with real life expected of students more creative, innovative, and capable of issuing cemerlangnya ideas in solving problems encountered (Parmin et al., 2016; Abadi, et al., 2017; Nagl, Obadovic & Segedinac 2012).

The research result of Latilla, et al. (2018) states that research or scientific concept is one way to facilitate knowledge of something, which has several functions and differences with others such as as managing knowledge, designing business and industry. The scientific concept always has effective function in learning that can help the student to create new integrity or personality for better knowledge (Leal Filho, et al., 2018). The concept of scientific learning concludes to make evaluationbased plans and regulations propagated through the network. After the student learns the scientific concept it will be able to give ideas individually, and can make evaluation to get new plan or idea. With the existence of scientific evaluation system helps the student to if there are obstacles in the development of learning ideas.

CONCLUSION

The conclusion from the results of the data analysis of the research conducted, the results show that an influence of the scientific approach on the natural science learning outcomes of class V students. This is evidenced by an increase in student learning outcomes on the average posttest score (85.37). Students who are classified as greater than the average value of the pretest (65.00). Based on the results of the research above, there are several suggestions that can be formulated follows : For teachers, it is better to apply a scientific approach to prepare all materials, tools, and materials carefully so that the use of time and learning activities can run effectively. When giving assignments to students to bring experimental equipment, make sure again one day in advance to bring what was assigned. It aims to make learning effective, no students insist on going home again to pick up tools and materials because it takes time. For school principals, it is better to conduct periodic class observations to be able to provide input to teachers about the learning process if it needs to be improved. In addition, the principal should seek to procure teaching learning media, subjects Natural Science

REFERENCES

- Abidin, Yunus. 2014. *Design of Learning Systems in the Context of Curriculum 2013*. Bandung. Refika Aditama
- Abadi, M. K., Pujiastuti H., Assaat L. D. (2017). Development of Teaching Materials Based Interactive Scientific Approach towards the Concept of Social Arithmetic For Junior High School Student. *International Conference on Mathematics and Science Education: Journal of Physics: Conf. Series* 812
- Arifin Zainal. 2011. *Learning Evaluation*. Bandung: Youth Rosdakarya
- Arikunto Suharsimi. 2014. *Research Procedures A Practical Approach*. Jakarta: Rineka Cipta
- Azwar Saifudin. 2015. *Research Methods*. Yogyakarta: Student Library
- B. Uno, Hamzah and Mohammad, Nurdin. 2014. *Learning with PAILKEM Approach*. Jakarta: The Earth of the
- Daryanto Script. *2013 Curriculum Scientific Learning Approach*. cet. I; Yogyakarta: Gava Media, 2014
- Hamalik Oemar. 2017. *Teaching and Learning Process*. Jakarta: PT Bumi Aksara
- Hosnan, M. 2014. *Scientific and Contextual Approaches in 21st Century Learning*. Jakarta. Ghalia Indonesia
- Kosasih, E. 2016. *Learning and Learning Strategies for 2013 Curriculum Implementation*. Bandung. Yrama
- Marjuki. 2020. *PAIKEM Learning Model Based on Scientific Approach*. Bandung: Youth Rosdakarya
- Nagl, G. M, Obadovic, Z. D, Segedinac, M. (2012). Effective Teaching of Physics and Scientific Method". *TEM Journal* 1(2)
- Regulation of the Minister of Education and Culture. Number 65 of 2013. Regarding *Standards for Primary and Secondary Education*. Jakarta: Ministry of National Education Regulation of the Minister of National Education. Number 22 of 2006. Concerning *Content Standards*. Jakarta: Ministry of National Education

- Parmin, Sajidan, Ashadi, Sutikno, & Maretta, Y. A. (2016). Preparing Prospective Teachers in Integrating Science and Local Wisdom through Practicing Open Inquiry. *Journal of Turkish Science Education*, 13(2), 3-14.
- Saifuddin Azwar Student Library. 2015. *Research Methods*. Yogyakarta: Student Library
- Setiawan, D & Wilujeng, I. (2016). The Development Of Scientific-Approach-Based Learning Instrumentsintegrated With Red Onion Farming Potency 1 In Brebes Indonesia. *Jurnal Pendidikan IPA Indonesia* 5 (1) 22-30
- Siregar Eveline and Nara Hartini. 2017. *Theory of Learning and Learning*. Bogor: Ghalia Indonesia
- Slameto. 2015. *Learning and Influencing Factors*. Jakarta: Rineka Cipt
- Sugiyono. 2017. *Quantitative, Qualitative and R&D Research Methods*. Bandung: Alfabeta
- Susilo, A., Siswandari & Bandi. (2016). Pengembangan Modul Berbasis Pembelajaran Saintifik Untuk Peningkatan Kemampuan Mencipta Siswa Dalam Proses Pembelajaran Akuntansi Siswa Kelas XII SMA N I Slogohimo 2014. *Jurnal Pendidikan Ilmu Sosial*, 26 (1)
- Susanto Ahmad. 2013. *Theory of Learning and Learning in Elementary Schools*. Jakarta: Kencana Prenadamedia Group
- Sodik F & Wijaya, M. S. (2017). Implementing Scientific Approach of 2013 Curriculum at KTSP-Based School for Teaching Present Continuous Tense. *English Education: Jurnal Tadris Bahasa Inggris* 10 (1), 16-28
- Law of the Republic of Indonesia. Number 14 of 2005 concerning Educators and Lecturers of the Law of the Republic of Indonesia. Number 20 of 2003. *Regarding the National Education System*. Jakarta. Director General of Higher Education Ministry of National Education
- Latilla, V. M., Frattini, F., Petruzzelli, A. M., & Berner, M. (2018). Knowledge management, knowledge transfer and organizational performance in the arts and crafts industry: a literature review. *Journal of Knowledge Management*.
- Leal Filho, W., Raath, S., Lazzarini, B., Vargas, V. R., de Souza, L., Anholon, R., ... & Orlovic, V. L. (2018). The role of transformation in learning and education for sustainability. *Journal of cleaner production*, 199, 286-295.
- Wati, A., Bharati L. A. D & Hartono, R. (2014). The Scientific Approach In Teaching Speaking For Various Texts (The Case Of Three Teacher Candidates of Wiralodra University Indramayu in The Academic Year 2013/2014). *English Education Journal* 4 (2)
- Wulandari, Asih (2015), Yogyakarta. His research is entitled "The Influence of Scientific Approach on Student Activity in Learning Science Class IV in Elementary School Muhammadiyah Pendowoharjo, Bantul, Yogyakarta" in *the Yogyakarta State University Education Journal* (pp. 9-10)

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