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The Influence of Learning Approaches to Critical Thinking Ability of Students Viewed From Locus of Control in Natural Sciences in Elementary School

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Abstract: The purpose of this study was to determine the effect of scientific and expository learning approaches in improving students' critical thinking skills in Natural Sciences in terms of locus of control. The research sample was obtained by simple random sampling technique. The sample size is 32 students with 8 people each cell. Data analysis was carried out using the Two Path Variance Analysis technique (2x2 ANOVA). The results showed that there was an interaction effect between learning methods and locus of control on students' critical thinking skills in science, meaning that the influence of the interaction between learning methods and locus of control had an effect on the high and low critical thinking skills in natural science.
Keywords: Learning Approach, Critical Thinking, Locus of Control

INTRODUCTION

Students' critical thinking skills become the basic capital in the development of science and in its application in society (Rachmadtullah, R. 2015). With this ability, students are able to analyze every event or problem that occurs and find the solution appropriately. Critical thinking involves the ability to think to respond smartly and argumentatively (Utomo, D. H. 2017). Using critical thinking skills when finding certain problems shows significant learning skills while teaching without explicit instruction or showing critical thinking is the most ineffective strategy (Radulović, L *et al*., 2017).

To overcome the students' low critical thinking skills, it needs to be overcome by using the right learning approach and maximizing its implementation in the classroom by paying attention to the student's locus of control (internal and external). Locus of control is one of the vital concepts in the context of learning difficulties and changing attitudes (Bharathi, S. V *et al*., 2017). Locus of control needs to be considered because it relates to beliefs, students' confidence in controlling or facing certain problems both in the classroom and in the surrounding environment. By knowing the tendency of locus of control students, it can be determined the appropriate learning approach to be given to students in improving their critical thinking skills, especially in Natural Sciences subjects. The results of the study state that there is a relationship between locus of control (LOC) and academic achievement, where internal beliefs are more related to greater academic (Kusuma, A. H. P *et al*., 2018).

Students' critical thinking skills in learning Natural Sciences in elementary schools are needed to help students in learning. Through the ability to think critically, every challenge faced in learning can be overcome properly, especially in understanding the material, the environment, analyzing a case, finding solutions and other abilities that enable students to have good competence in learning and apply it in their environment.

However, in reality it cannot be denied that the Natural Sciences subject tends to be considered a difficult subject and has a difficult challenge. Only a small percentage of students are able to form and train their critical thinking skills and even in most students do not have the ability to think critically.

This study aims to determine the effect of scientific and expository learning approaches in improving students' critical thinking skills in Natural Sciences in terms of locus of control.

Thus, based on the explanation above, the approach that is deemed appropriate in learning is used, namely the scientific approach in improving students' critical thinking skills in Natural Sciences in terms of locus of control.

METHOD

This study uses an experimental research design with factorial 2 x 2 design, with the dependent variable in this study being critical thinking skills, while the independent variable is the learning approach with attributes is locus of control. Treatment variables are divided into two, namely the scientific learning approach (A1), and expository learning (A2), where both will be used in learning in two different classes namely VA class using scientific learning and VB class using expository learning. The attribute variable is internal locus of control (B1) and external locus of control (B2).

The population in this study were students of Pondok Labu 16 elementary school in South Jakarta, DKI Jakarta Province. From the school, class V was taken as a research class, where class V of the existing Pondok Labu 16 elementary school in South Jakarta, DKI Jakarta Province consisted of two classes namely the VA and VB classes. Considering the small number of population, the number of samples is determined, namely the whole class V in the Pondok Labu 16 elementary school in South Jakarta, namely the VA class, amounting to 30 students and the VB class, totaling 31 students. The sample is part or representative of the population under study, with the intention of generalizing the results of research that applies to the population (Arikunto, 2006). A sample of 41 students from the Pondok Labu 16 elementary school in South Jakarta, DKI Jakarta Province.

Sampling was carried out using the "simple random sampling" technique with the following process: 1) randomly selected primary schools to be taken as a sample of 355 elementary schools in South Jakarta City and selected SDN Pondok Labu 16 South Jakarta DKI Jakarta Province; 2) set class V as a research sample consisting of two classes namely VA class and VB class; 3) test the locus of control on students who are sampled to find out students who have internal and external locus of control categories; 4) with the existing population, the number of samples is determined, namely the whole class V in the Pondok Labu 16 elementary school in South Jakarta, DKI Province, namely the VA class of 30 students and VB classes as many as 31 students; 5) the results of the student locus of control category test were analyzed to find out students with internal and external locus of control categories. From this category, the research analysis unit was determined by taking 27% of 30 VA class students starting from the lowest score for groups of students who had the locus of control category and conversely taking 27% from 30 students starting from the highest score for groups of students who had the locus category external control. In the same way, it is also done in class VB. Determination of the number of samples using formulas (Popham, 1981). After it is known that students have an internal locus of control and students who have an external locus of control, then the code/symbol is given to each student to make it easier to sort. This process simultaneously records the names of students in both groups. However, in the treatment process, the analysis unit is not separated from the other student colleagues.

The type of data analysis used in this study was to use a two-way analysis of variance with a 2 x 2 factorial design. To be able to test hypotheses, it is necessary to test the analysis requirements, namely the normality test and homogeneity test. The results of the calculation of the data normality test with Lo were consulted with the critical value on the Liefabel Liliefors Test at a significant level of 0.05. While the homogeneity test is carried out using the Bartlett Test which includes: a) test the variance homogeneity in the two treatment groups A1 and A2; b) test the variance homogeneity in the two treatment groups B1 and B2, and c) test the variance homogeneity in the four groups of experimental design cells

Hypothesis testing carried out in this study by using two-way technical analysis of variance (ANOVA) with the aim of testing the main effect of A and the interaction effect, namely the influence of interactions A and B. If there are the influence of interaction between A and B, then a further test is done by using the Tuckey Test which aims to test the simple effect that is testing the differences in critical thinking skills in the group of students who are taught with scientific learning approaches and have internal locus of control with groups of students who are taught by learning expository and has internal locus of control, as well as critical thinking skills in groups of students who are taught by scientific learning approaches and have external locus of control with student groups that are taught by expository learning and have external locus of control.

RESULTS

Hypothesis testing uses 2-way ANOVA. Calculation of 2 lane ANOVA can be concluded as a test result of hypothesis 1, 2, 3. If F count is greater than F table then H0 is rejected and accept H1 at the real level $\alpha = 0.05$. The test results are as follows:

For the results of the first hypothesis test, the value of F (hA) = 5.76> Ftable = 4.20, shows that there is a significant difference in the average critical thinking ability of NATURAL SCIENCE between groups of students given scientific learning methods and Expository learning methods.

The results of the second hypothesis test, F (hB) = 10.23> Ftable = 4.20, indicate that there is a significant difference in the critical thinking skills of

natural knowledge between groups of students who have Internal Locus of Control and groups of students who have External Locus of Control.

The results of the third hypothesis test, the value of F (hAB) = 57.19> Ftable (0.01) = 7.82, indicating that there is a very significant interaction effect between factor A (learning method) and factor B (Locus of Control) on ability to think critically in natural science students. The magnitude of the interaction effect of the learning method and Locus of Control (AxB) can be calculated using the formula [6].

$$\frac{db(F_{hit}-1)}{db(F_{hit}-1)+N}$$

Because there is an interaction between A and B, a further test using the Tuckey test was used to test the difference in absolute mean values of the two groups paired by comparing the critical value of the Tuckey Figures (Q). The Tuckey test formula is as follows:

$$= \frac{|\bar{Y}_p - \bar{Y}_q|}{\sqrt{\frac{RJK(D)}{n}}}$$

The Tuckey test results can be concluded as a test of hypotheses 4, 5, 6 and 7. Test criteria if Q □ Q1 α, H1 is accepted and rejected H0 if Q has other prices at a significance level of α = 0.05. The test results are as follows:

The results of the fourth hypothesis test, the value of Qh for groups A1B1 and A2B1 is greater than Qt or 21.59> 4.53, indicating that the average critical thinking ability of natural science students who are given learning using the scientific method is higher than those who use the method expository for students who have Internal Locus of Control.

The results of the fifth hypothesis test, Qh for groups A1B2 and A2B2 are smaller than Qt or -7.95 <4.53, indicating that the average natural Sciences critical thinking ability of students given learning using the scientific method is lower than those using the expository method on students who have external locus of control.

The results of the sixth hypothesis test, the value of Qh for the A1B1 and A1B2 groups is greater than Qt or 19.89> 4.68, indicating that the average NATURAL SCIENCE critical thinking ability of students given learning using the scientific method in students who have Internal Locus of Control higher than students who have External Locus of Control.

The results of the seventh hypothesis test, the value of Qh for groups A2B1 and A2B2 is smaller than Qt or -20.68 <4.53, indicating that the average natural Sciences critical thinking ability of students given learning using the expository method in students who have Internal Locus of Control is lower in students who have External Locus of Control.

DISCUSSION

The results of the first hypothesis test found that there were significant differences in critical thinking skills of natural science between groups of students given scientific learning methods and expository learning methods. This is indicated by the average score of the students' critical thinking skills in science using the scientific method higher than the group of students who were taught using the expository method.

This significant difference is caused in the scientific method, the presentation of material in more detailed, systematic, knowledge acquisition is arranged based on a logical structure. The learning process directs students to find the fact that there is a relationship between the objects analyzed and the learning material taught by the teacher, so that they are more interested in learning. In this case students are given the opportunity to prove the truth of their reasoning.

The scientific approach is designed so that students actively build various competencies through the stages of observing, formulating problems, collecting data with various techniques, analyzing, drawing conclusions, and communicating. This is intended to give understanding to students in recognizing and understanding various materials using the scientific method that information can come from anywhere, anytime, does not depend on the same direction information from the teacher. so that the expected learning conditions are directed at encouraging students to find out from various sources through observation and not just being told (Maryani, I *et al.*, 2018).

The application of scientific methods in learning involves process skills such as observing, classifying, measuring, predicting, explaining and concluding according to the facts or phenomena that are displayed. Through such process skills in scientific learning, it is believed that it can train students to solve problems given according to their level of development. According to Rusman, the tendency of the 21st century is marked by an increase in the complexity of learning technology so that the world of work will require people who can take the initiative, think critically,

creatively, and be able to solve problems (Rusman, 2017).

The results of the second hypothesis test found that there were significant differences in the average critical thinking skills of the natural Science between groups of students who had internal locus of control and groups of students who had external locus of control.

Internal locus of control is also interpreted as a belief to determine one's own success based on the ability to choose activities, responsibility for decisions, the ability to control change, the ability to control the environment by seeking information, learning satisfaction by showing achievements, and learning motivation based on expectations (Widjaja, L. W. 2014).

The implications of internal locus of control and external locus of control can be seen in learning. Students who have internal locus of control tend to have better thinking skills, better memory, prefer assignments that are because they believe they are able to solve a problem at hand. While when compared with students who have external locus of control tend to have less control over themselves. Locus of control has an influence on students' learning achievement and students with internal locus of control have an average better performance than external groups (Dewi, R. 2013).

The results of the third hypothesis test found that there was a very significant interaction effect between factor A (learning method) and factor B (locus of control) on students' critical thinking skills in science. The existence of a very significant interaction between learning methods and locus of control means influencing the high or low critical thinking skills of natural science of elementary school students.

Learning method is a way that teachers do in teaching students in classes that are detailed, systematic and become a guide in presenting subject matter so that the expected goals are achieved according to the learning competencies to be achieved (Sumantri, M. S *et al*., 2018). The preparation of the learning methods carried out has been adjusted to the characteristics of subjects and material. This means that the use of appropriate methods can arouse learning motivation and activeness of students in learning (Darmadi, D. 2017). This affects the improvement of students' natural science thinking skills. The method is interpreted as a way or method taken by someone to achieve the expected goals and in finding the right method in delivering the material, the material provided can be absorbed properly by students (Sumantri, M. S *et al*., 2016).

The results of the fourth hypothesis test found that the average science critical thinking ability of students who were given learning using the scientific method was higher than those who used the expository method in students who had an internal locus of control.

Students who have an internal locus of control have confidence that success in learning is based on their own abilities. So that they do not need the process of presenting learning must be in more detailed, systematic, and with logical structures, but they can more easily understand the material without being given learning by the scientific method. Students feel challenged when taught to explore an object with a scientific method so that students who have an internal locus of control are more likely to face the learning given.

The results of the fifth hypothesis test found that the average critical thinking ability of natural science students who were given learning using the scientific method was lower than those who used the expository method in students who had external locus of control.

The previous description on the third hypothesis has explained that students who have external locus of control find it difficult to follow the process of acquiring knowledge in learning that is arranged logically, in detail, systematically in observing an event or phenomenon included in the subject matter. These conditions have an impact on the low ability of students to master the material given. By that, students who have external locus of control are more suitable if given learning by using the expository method because the presentation of learning material using the expository method makes it easier for students to understand the learning material.

The results of the sixth hypothesis test found that the average natural Science critical thinking ability of students given learning using the scientific method in students who have an internal locus of control is higher than students who have external locus of control.

The previous description has also been explained that students who have an internal locus of control have confidence that success in learning is based on their own abilities. So that they do not need the process of presenting learning must be in a more detailed, systematic, and with a logical structure, but they can more easily understand the material without being given learning by the scientific method.

While for students who have external locus of control it is difficult to follow the process of acquiring knowledge in learning that is arranged logically, in detail, systematically in observing an event or

phenomenon included in the subject matter. These conditions have an impact on the low ability of students to master the material given. By that, students who have external locus of control are more suitable if given learning by using the expository method because the presentation of learning material using the expository method makes it easier for students to understand the learning material.

The results of the sixth hypothesis test found that the average natural science critical thinking ability of students who were given learning using the expository method in students who had an internal locus of control was lower than students who had external locus of control.

Referring to the previous description that students who have external locus of control and are given learning using the expository method are more suitable because the presentation of learning material using the expository method makes it easier for students to understand learning material, where they believe that the abilities obtained in learning are not due to effort themselves but are influenced by the learning environment (use of the expository method). This illustrates that teachers are more dominant in learning. This method leads to providing lesson content to students directly, students do not need to find and find facts, principles, and concepts by themselves, because the material has been clearly presented by the teacher (Kirschner, P. A *et al*., 2006; Prayeki. 2016). The success of expository learning depends on the ability of the teacher to prepare learning and knowledge possessed.

While students who have internal locus of control and are given learning by using the expository method are seen as less suitable because the presentation of material that is centered on the teacher makes students less interested and not challenging in learning, thus impacting students' low ability to understand the material.

CONCLUSION

The value of critical thinking skills of natural science students who have the Internal Locus of Control category learned by using the Expository learning method is lower than the students who have the External Locus of Control category that is learned using the Expository learning method. It is expected that the teachers and schools can facilitate student learning both in terms of learning resources, training, try out questions, and use the right learning method as a complement that helps students be able to absorb as much information as possible so that critical thinking skills can increase more optimally.

REFERENCE

1. Bharathi, S. V., & Joseph, S. (2017). Understanding the locus of control of management students-an exploratory study. *International Journal of Learning and Intellectual Capital*, *14*(3), 234-251.
2. Darmadi, D. (2017). Pengembangan model dan metode pembelajaran dalam dinamika belajar siswa. *Yogyakarta. Deepublish*.
3. Dewi, R. (2013). Hubungan Perilaku Pemimpin, Struktur Tugas, Locus Kendali Terhadap Performance Kerja Guru SD Kecamatan Medan Sunggal. *Jurnal Title*.
4. Kadir. (2015). *Statistika Terapan Konsep, Contoh dan Analisis Data dengan SPSS/Lisrel dalam Penelitian*. Jakarta: Rajawali Pers.
5. Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational psychologist*, *41*(2), 75-86.
6. Kusuma, A. H. P., Rina, R., & Syam, A. H. (2018). The Main Role of Locus of Control and Professional Ethics on Lecturer's Performance (Indonesian Lecturer Empirical Study). *International Review of Management and Marketing*, *8*(5), 9-17.
7. Maryani, I., & Fatmawati, L. (2018). *Pendekatan scientific dalam pembelajaran di sekolah dasar: Teori dan praktik*. Deepublish.
8. Prayeki. (2016). Effects of Problem-Based Learning Model Versus Expository Model and Motivation to Achieve for Student's Physic Learning Result of Senior High School at Class Xi. *Journal of Education and Practice*, 7.1.
9. Rachmadtullah, R. (2015). Kemampuan Berpikir Kritis Dan Konsep Diri Dengan Hasil Belajar Pendidikan Kewarganegaraan Siswa Kelas V Sekolah Dasar. *Jurnal Pendidikan Dasar*, *6*(2), 287-298.
10. Radulović, L., & Stančić, M. (2017). What is Needed to Develop Critical Thinking in Schools?. *Center for Educational Policy Studies Journal*, *7*(3), 9-25.
11. Rusman. (2017). *Belajar dan Pembelajaran*. Jakarta: Kencana.
12. Sumantri, M. S., & Rachmadtullah, R. (2016). The Effect of Learning Media and Self Regulation to Elementary Students' History Learning Outcome. *Advanced Science Letters*, *22*(12), 4104-4108.
13. Sumantri, M. S., Prayuningtyas, A. W., Rachmadtullah, R., & Magdalena, I. (2018). The Roles of Teacher-Training Programs and

Student Teachers' Self-Regulation in Developing Competence in Teaching Science. *Advanced Science Letters*, *24*(10), 7077-7081.

14. Utomo, D. H. (2017). Brain Based Learning: Effects Model A-Car in Critical Thinking Skills.
15. Widjaja, L. W. (2014). Hubungan lokus kontrol internal dengan regulasi diri pada mahasiswa Sekolah Tinggi Agama Budha (STAB) Maha Prajna Jakarta. *Psiko-Edukasi*, *12*(2).