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LEARNING MODEL IMPROVED THINKING SKILLS TO IMPROVE THE STUDENT LEARNING OUTCOMES IN SCIENCE LEARNING

Yus Alvar Saabighoot[1], Maman Rumanta[2]

Universitas Terbuka UPBJJ-Serang

yusalvar@ecampus.ut.ac.id

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Abstract

This research is motivated by the low quality of science learning in elementary schools. The objective of this research is to produce a product in the form of developing a learning model improved thinking skills to improve the student learning outcomes. This research uses a Research and Development approach. The research phase includes (a) preliminary study, (b) identification results which are used as the basis for model development, and (c) the models that have been developed are then tested extensively. During the model trial, modifications were made to the implementation of the model; adjustments were made according to the needs of teacher performance improvement. There is always an improvement in the model design, implementation, and evaluation of every trial that has been carried out. The results of the extensive trials show that the learning model improved thinking skills has a good effect on improving the student learning outcomes. Based on the statistical test through t-test = 0.05 (95% significance) obtained a significant difference in the learning outcomes in each trial. In conclusion, the learning model improved thinking skills can improve student learning outcomes in science learning and can improve the teacher's performance in science learning.

Keywords: Learning Model; Improved Thinking Skills

A. Introduction

Changes and developments that occur in Indonesia include the aspects of the economy, politics, culture, science, and technology, requiring people around the world in general and Indonesian people, in particular, to be able to compete in various fields. This condition is a consequence of the era of globalization, where human resources are used as state assets for the progress of a country.

The conditions that occur in this era of globalization, have an impact on the lives of Indonesian people, so the mindset, patterns of action, and the readiness of the Indonesian people in facing the era of globalization are continuously improved, one of which is by improving the quality of human resources. Human resources in Indonesia are still underestimated by other countries, this can be seen from the low income obtained by Indonesian workers. Besides that Indonesia's ranking on the quality of human resources is far behind, this has an impact on international trust in the quality of human resources in Indonesian society (World Bank, 2020).

Singapore tops the Human Capital Index (HCI) globally with 0.88 points and also places it as the champion in Southeast Asia. Singapore is considered superior in improving the quality of world-class education. The quality of health also increases, so life expectancy is also high. In 2020, Indonesia, which is below Singapore, produced 0.54 points, the same as the 2018 HCI. Its position is below Vietnam (0.69 points), Brunei Darussalam (0.63 points), Malaysia (0.61 points), and Thailand (0.61 points).

The statement above illustrates that human resources in our country are still far behind other countries, so the government is responsible for making policies related to improving the quality of human resources. One of the government's efforts in improving the quality of human resources is to socialize the importance of education for the lives of Indonesian people. Such as government programs that

proclaimed nine years of compulsory education, the establishment of international-based schools, and other policies that can support the improvement of human resources.

The explanation above is clear that to produce human resources is very appropriate through education because to form the quality human resources need to be directed and initiated from early childhood education to college. Article 3 of Law No. 20 of 2003 concerning the National Education System states that the functions and objectives of education are "Develop abilities and shape the character and civilization of a dignified nation in the context of educating the nation's life, aims to develop the student's potential to become human beings who believe and fear God Almighty, have noble characters, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens".

Related to the statement above, it is clear that the function and purpose of national education are a basis for developing the educational policies in the management of education by the government and the society. To support the achievement of educational goals, the curriculum and learning will occupy a strategic position as part of the education system. The education system in Indonesia consists of basic education which includes an elementary school, junior high school, high school education, and higher education.

Basic education is very strategic to put the foundation of intelligence, knowledge, personality, noble character, skills to live independently and take further education. Minister of Education and Culture Regulation Number 20 of 2016 concerning Graduate Competency Standards in Elementary Schools developed by BNSP.

The Graduate Competency Standards that have been formulated above are none other than achieving the goals of basic education, so a basic education curriculum structure is arranged. The fields of study are grouped into eight groups, namely Religious Education, Citizenship Education, Indonesian Language,

Mathematics, Science, Social Study, Cultural Arts and Skills, Physical Education, Sports, and Health.

"Science comes from the word of natural science, which means that science is about nature or knowledge that studies events that occur in nature" (Sujana, 2009: 3). Meanwhile, according to Kerrod, Robin (1983) stated that science is the broad field of human knowledge, acquired Obtained using systematic observation and experiment, and explained with the aid of rules, laws, principles, theories, and hypotheses. The curricular objectives of Science in the basic education curriculum are to educate children to understand science concepts, have scientific skills, and religious. (Yasbiati, 2005:27).

Based on the objectives of science education above, the problem that often arises in society so far is the science learning outcomes that are still low, especially at the elementary school level. The low learning outcomes are caused by many factors, including students who are not optimal in mastering science subjects because the learning pattern used by the teacher only emphasizes memory or memorization, the teacher does not emphasize students being able to think holistically. Besides that, in the process of teaching and learning activities, the teacher still seems to dominate learning, so the learning becomes one-way, namely, the teacher conveys information and students receive information. The impact of that learning pattern has an impact on students' low thinking skills and has an impact on student learning outcomes.

Teachers have a very strategic role in determining the success of students, especially in the teaching and learning activities. The teacher is the most influential component in the creation of learning processes and outcomes. Therefore, improving the quality of learning is the teacher's responsibility in the classroom.

In addition to the teacher, the factors that have an important role in the learning process are students. Students are part of the learning process components, so the position of students in learning is as important as other learning components. In the learning

process, the characteristics of students need to be considered, because to make decisions related to the objectives, materials, methods, media, and evaluation systems, teachers need to know the characteristics of students first. This will affect the student activity improvement in the learning process, such as learning discipline, learning motivation, and even the achievement of the desired basic competencies in the learning process.

Based on the described background, the low quality of learning in the field of science in elementary schools is one of the problems faced by the world of education in Indonesia, especially in terms of the learning process, which includes many teachers who do not understand various learning models, the static teaching patterns are lack of variations so the learning process is more teacher-centered than student-centered, teachers in implementing the curriculum and learning emphasize the completion of a program rather than mastery of learning. These conditions will affect the low students' learning outcomes, especially in science.

Operationally, six main variables play a very important role in the learning process that affect science learning outcomes including the learning objectives, subject material, students, teachers, facilities, and evaluation. The variables of the learning process can be seen in the following figure.

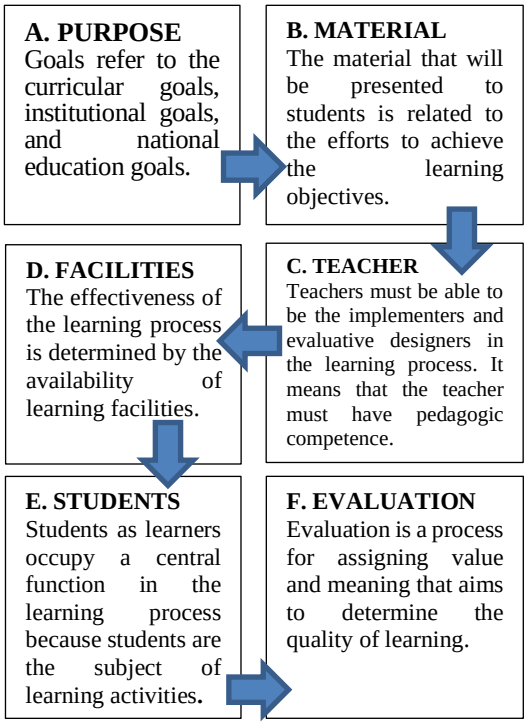

Figure 1 Learning Process Variables

Given the importance of thinking skills for students to achieve the integrity of a learning process and the achievement of the graduate competency standards, teachers are

therefore required to be able to design the learning well. To fulfill these demands, various kinds of learning innovations were carried out, one of which was the development of learning models to improve thinking skills, namely students' thinking skills in improving learning outcomes.

The learning model improvement thinking skills aims to prepare and equip students in solving social problems according to the level of student development. The following are the steps of the learning model improved thinking skills before and after being developed.

Learning Model Improved Thinking Skills Before Being Developed	Learning Model Improved Thinking Skills Developed
1. **Orientation** 2. **Tracking** 3. **Confrontation** 4. **Inquiry** 5. **Accommodation** 6. **Transfer**	1. **Orientation** 2. **Tracking** 3. **Confrontation** 4. **Inquiry** 5. **Accommodation** 6. **Treatment** 7. **Transfer**

Figure 2 Learning Model Improved Thinking Skills Before and After Developed

B. Research Methodology

The research method is an activity based on scientific characteristics, namely rational, empirical, and systematical, to obtain data with certain purposes and uses (Sugiyono, 2008: 2)

From the opinion above, the researcher classified the right and appropriate research methodology to overcome the problems faced by researchers in the field.

The research method used in this research is the Research and Development method because it is considered relevant to capture research data desired by researchers, namely wanted to develop and improve the practice of learning models to improve thinking skills in Public Elementary Schools in Serang City, Banten Province.

C. Result and Discussion

Table 1
Student Learning Outcome Evaluation Test

Trials	Min Score	Max Score	Average Score	Std. Deviation
Pre-test	25	55	40.17	6.858
Post-test 1	41	74	60.69	9.854
Post-test 2	63	80	71.09	4.448
Post-test 3	65	81	75.26	3.876
Post-test 4	70	86	79.11	4.164

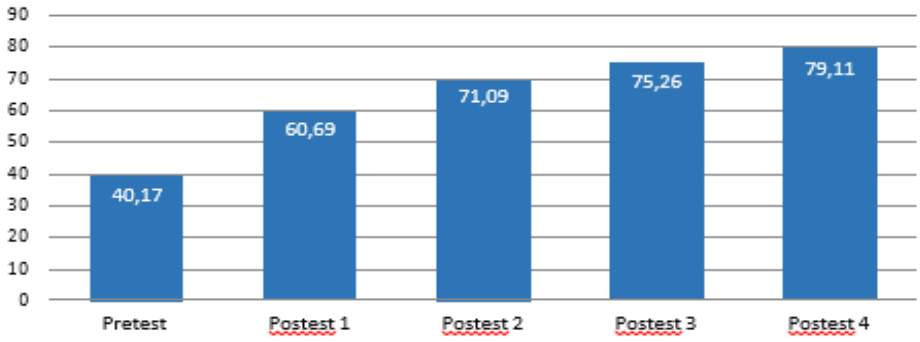

Figure 3 Graph of the Average Score of Student Learning Outcomes at the Limited Trial

Table 2
T-Test Results of Pre-test Score up to the Trial Test Results 4 (Post-test 4) On the Limited Trial

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	prestest - postest1	-20.514	7.849	1.327	-23.211	-17.818	-15.462	34	.000
Pair 2	postest1 - postest2	-10.400	8.279	1.399	-13.244	-7.556	-7.432	34	.000
Pair 3	postest2 - postest3	-4.171	3.877	.655	-5.503	-2.840	-6.366	34	.000
Pair 4	postest3 - postes4	-3.857	4.038	.682	-5.244	-2.470	-5.652	34	.000

Table 3
Test Result Score

Aspects	UC1	UC2	UC3	UC4
1. Learning Model Implementation:	35	70	85	100
❖ Conformity with the lesson plan (30)	15	25	30	35
❖ Application of patterns/approaches in learning (40)	10	20	25	35
❖ The suitability of the use of media with the material (30)	10	25	30	30
2. Teacher Performance:	45	78	93	98
❖ Understanding lesson plans (20)	15	20	25	25
❖ Carry out the stages of the learning model to improve thinking skills. (30)	10	18	20	23
❖ Management of the classroom environment (context element) that supports the process of teaching and learning activities. (20)	5	10	18	20
❖ Utilizing the learning media. (20)	10	20	20	20
❖ Performing retention to strengthen students' thinking skills. (10)	5	10	10	10
3. Student Ability:	46	72,1	87,5	97,9
❖ Participate in teaching and learning activities. (30)	20	25	30	30
❖ Responding to the teacher's learning process in the teaching and learning activities. (20)	10	20	20	20
❖ Asking questions and providing opinions/responses. (30)	0	10	20	30
❖ Completed the learning outcomes evaluation test. (10)	10	10	10	10
❖ Evaluation test results. (10)	6.0	7.1	7.5	7.9
4. Obstacle factors:	30	15	10	10
❖ Teachers do not fully understand the learning model to improve thinking skills. (10)	10	5	-	-
❖ The teacher does not allow students to ask questions/express opinions. (10)	10	5	-	-
❖ The students have not dared to ask questions and express opinions/responses. (10)	10	5	-	-
❖ Obstacles to the open-ended questions. (10)	-	-	10	10

Based on the limited trial results, each aspect is (a) learning model implementation, (b) teacher performance, (c) student abilities and activities, (d) obstacle factors. Each aspect will be given a score of 100 so it will be seen how the improvements have occurred from each of these aspects. The details of each aspect are as follows:

In the aspect of the learning model implementation, the assessment points are described as follows:

• Suitability of lesson plans (30)
• Application of patterns in learning (40)
• The suitability of the use of media with the material (30)

The aspects of teacher performance are described through the following points:

• Understanding lesson plans (20)
• Carry out the stages of the learning model to improve thinking skills (30)
• Management of the classroom environment (context element) that supports the process of teaching and learning activities (20)
• Utilizing the learning media (20)
• Performing retention to strengthen students' thinking skills (10)

Next, the aspects of students' abilities are described through the following points:

• Participate in teaching and learning activities (30)
• Responding to the teacher's learning process in the teaching and learning activities (20)
• Asking questions and providing opinions/responses (30)
• Completed the learning outcomes evaluation test (10)
• Evaluation test results (10)

The aspects of the obstacle factors are given a score of 10 for each identified obstacle and can be described through the following points:

• Teachers do not fully understand the learning model to improve thinking skills (10)
• The teacher does not allow students to ask questions/express opinions (10)
• The students have not dared to ask questions and express opinions/responses (10)
• Obstacles to the open-ended questions (10)

Based on the graph above, it can be seen that when entering the third trial, the model used has been running well and stable, so after the fourth trial, the implementation trial can be ended, and thus the final form of the model has been obtained.

D. Conclusion

Based on the findings of the data analysis results obtained from preliminary study activity, limited trials, and extensive trials, it can be concluded that the learning model improved thinking skills can improve the student learning outcomes.

From the limited trial and the extensive trial, each of which was conducted four times, it was found that there was a significant difference between the initial test results and the final test results. The average score of the final test results after learning using the learning model improved thinking skills developed had increased significantly compared to the average score of the initial test results before the learning model was developed.

This conclusion is supported by the statistical analysis results of the overall score of students' learning outcomes during the trials, both limited trials and extensive trials, which obtained $t_{count} > t_{table}$ in each test.

The advantages of the learning model improved thinking skills developed to make students be more prepared to face every problem presented by the teacher. The priority of learning emphasizes students' thinking skills holistically so learning through this model is considered to be able to improve students' cognitive aspects. This model connects learning with real-life through exploring each student's experience.

References

Alwasilah, C. (2003). *Pokoknya Kualitatif : Dasar-dasar Merancang dan Melakukan Penelitian Kualitatif*. Bandung : Kiblat Buku Utama.

Ahmadi, A & Supriyono, W. (2004). *Psikologi Belajar (Edisi Revisi).* (cetakan kedua) Jakarta : PT. Rineka Cipta

Ahmad Syachruroji (2015). Peningkatan Hasil Belajar Keterampilan Berpikir Kritis Pada Bidang Studi IPA Melalui Metode Pembelajaran Berbasis Inkuiri. Vol 1, No 1 (2015): JPsd (Jurnal Pendidikan Sekolah Dasar) Untirta

Arfin, Zaenal (2009). *Evaluasi Pembelajaran.* (cetakan pertama) Bandung : PT. Remaja Rosadakarya.

Brog, W.R. & Gall, MD. (2003). *Education Research AN Instruction. London : Longman, Inc*.

Bassham G. dkk. (2011). Critical Thinking a Student Introduction. New York: McGraw–Hill Compenies, Inc.

Carin, Arthur A. (1993) *Teaching Modern Science.* New York: Macmillan Publishing Company.

Encep Andriana, Mudmainah Vitasari, Yuvita Oktarisa, Dyan Novitasari (2017) Pengembangan Multimedia Pembelajaran Ipa Berbasis Kearifan Lokal Di Sekolah Dasar. Vol 3, No 2 (2017): Jpsd (Jurnal Pendidikan Sekolah Dasar).

Galuh Rahayuni, (2016) Hubungan Keterampilan Berpikir Kritis dan Literasi Sains Pada Pembelajaran IPA Terpadu Dengan Model PBM dan STM. Vol 2, No 2 (2016): Available Online in Desember 2016 (Web of Science Indexed)

Hamalik, Oemar (1986). Strategi Belajar Mengajar. Bandung : Pustaka Martiana.

Hamalik, Oemar (2009). Dasar-Dasar Pengembangan Kurikulum. Bandung : PT. Remaja Rosadakarya.

Ibrahim, R. & S. Syaodih, Nana. (2003). Perencanaan Pengajaran. Jakarta : PT. Rineka Cipta.

Izzatun Nada, Sri Utaminingsih, Sekar Dwi Ardianti (2018). Penerapan Model Open Ended Problems Berbantuan CD Pembelajaran Untuk Meningkatkan Kemampuan Berpikir Kreatif Siswa Kelas IV SD 1 Golantepus. Vol 4, No 2 (2018): JPsd (Jurnal Pendidikan Sekolah Dasar) Untirta.

Kerrod, Robin. (1983). Collint Guide to Modern Teaching. New York: Macmillan Publishing Company.

Milama, B, Bahriah, ES, and Mahmudah, A (2018), 'The Effect of Search, Solve, Create, And Share (SSCS) Learning Model towards Student's Critical Thinking Skills', Jurnal Penelitian dan Pembelajaran IPA Untirta, vol.3, no.2, pp. 112-23

Matlin, M.W. (1994). Cognition. New York: Hardcourt Brace Publishers.

Nana Hendracipta, Lukman Nulhakim, Siti Mariam Agustini. (2017) Perbedaan Kemampuan Berpikir Kritis Siswa Melalui Penerapan Model Inkuiri Terbimbing di Sekolah Dasar. Vol 3, No 2 (2017): JPsd (Jurnal Pendidikan Sekolah Dasar) Unitrta

Peraturan Menteri Pendidikan Nasional Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional. Jakarta : (Tidak diterbitkan)

Peraturan Menteri Pendidikan Nasional Nomor 22 Tahun 2006 tentang Standar Isi pada Pendidikan Dasar dan Menengah.. Jakarta : (Tidak diterbitkan)

Peraturan Menteri Pendidikan Nasional Nomor 20 Tahun 2016 tentang Standar Kompetensi Lulusan pada Pendidikan Dasar don Menengah. Jakarta : (Tidak diterbitkan)

Piaget, J. (1970). *Science of Education and The Psychology of The Child.* New York : The Viking Press, 1970.

Print, Murray. (1993) *Curriculum Development and Design.* Australia : Allen & Unwin.

Slavin, R.E. (2000). Educational Psychology Theory and Practice. Boston: Allyn Bacon

Sanjaya, Wina. (2008). Perencanaan dan Desain Sistem Pembelajaran. (cetakan ke 1) Jakarta : Kencana Prenada Media Group.

Sanjaya, Wina.(2009). Stratagi Pembelajaran Berorientasi Standar Proses Pendidikan. (cetakan ke 6) Jakarta : Kencana Prenada Media Group.

Sugiyono.(2008).Metode Penelitian Kuantitatif Kualitatif dan R&D. (cetakan ke 5). Bandung : Alfabeta.

Sukmadinata, Nana. Syaodih. (2009). *Metode Penelitian Pendidikan.* (cetakan ke 5). Bandung : PT. Remaja Rosadakarya

Sujana, Atep. (2009). Peta Konsep (Concept Maps) dalam Pembelajaran Sains : Studi Pada Siswa Kelas V Sekolah Dasar. Bandung : Jurnal Pendidikan Dasar ISSN : 1829-5606. Nomor. 12 Oktober 2009.

World Bank. (2020). Indeks Modal Manusia Indonesia Peringkat Keenam di Asia Tenggara.

Yasbiati (2005). Pengembangan Keterampilan Proses Sains Melalui Model Siklus Belajar Untuk Siswa Kelas V Sekolah Dasar. Bandung : Jurnal Pendidikan Dasar ISSN : 1829-5606. Vol 11 No. 4 April 2005.

Yus Alvar Saabighoot (2010). Tesis "Pengembangan Model Pembelajaran Peningkatan Kemampuan Berpikir Kritis Untuk Meningkatkan Hasil Belajar IPA. Bandung : UPI.