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The 7E Learning Cycle Model and it's Important on Cognitive Learning Outcomes of Reasoning

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Abstract

This study aims to determine the effect of the 7E learning cycle model on cognitive learning outcomes of reasoning on the material of natural change in fifth grade elementary school. The method used in this study was a quasi-experimental design using an unequal control group design. The sample was 41 students from two classes (class A and class B) and it was chosen by using purposive. Class V A had 21 students who used the 7E learning cycle model, and class V B had 20 students who used the traditional learning. The results of this study were quantitative and qualitative data. The data obtained from students' mathematical connection abilities before the implementation of learning and it obtained from student questionnaires and analysis of observation sheets. The results of this study were: (1) the Learning Cycle Model could improve learning outcomes of science reasoning changes in the shape of objects (2) increased the activity of students who got Learning Cycle 7E better than students who got conventional learning, (3) and most students

gave positive attitude towards the 7E learning cycle. This study implied to improve the learning outcome of reasoning by applying the 7E Learning Cycle Model especially in Primary School.

Keywords: Cognitive, Learning Outcome, Reasoning, 7E Learning Cycle.

Abstrak

Penelitian ini bertujuan untuk menguji pengaruh model pembelajaran 7E cycle terhadap hasil belajar kognitif penalaran pada materi perubahan alam di kelas V Sekolah Dasar. Metode yang digunakan dalam penelitian ini adalah quasi eksperimen design dengan menggunakan unequal control group design. Sampel berjumlah 41 siswa dari dua kelas (kelas A dan kelas B) dan dipilih dengan menggunakan metode purposive. Kelas V A terdapat 21 siswa yang menggunakan model pembelajaran siklus 7E, dan kelas V B terdapat 20 siswa yang menggunakan pembelajaran tradisional. Hasil penelitian ini berupa data kuantitatif dan data kualitatif. Data diperoleh dari kemampuan koneksi matematis siswa sebelum pelaksanaan pembelajaran dan data tersebut diperoleh melalui angket siswa dan analisis lembar observasi. Hasil penelitian ini adalah: (1) Model pembelajaran siklus 7E dapat meningkatkan hasil belajar penalaran IPA perubahan bentuk benda (2) meningkatkan aktivitas siswa yang belajar dengan siklus 7E lebih baik daripada siswa yang mendapatkan pembelajaran konvensional, (3) dan sebagian besar siswa memberikan sikap positif terhadap pembelajaran siklus 7E. Penelitian ini berimplikasi pada peningkatan hasil belajar penalaran dengan menerapkan model pembelajaran siklus 7E khususnya di Sekolah Dasar.

Kata Kunci: *Hasil Belajar, Kognitif, Penalaran, Siklus 7E.*

INTRODUCTION

Based on our observations on the fifth-grade students of Kepahiang 03 State Elementary School during the academic year 2021/2021, we discovered various issues that occurred throughout the learning process, such as they did not promote learning achievement. Some of these issues include pupils that were passive, lack excitement for learning, and not prepared to acquire learning information, therefore students in class converse a lot and did not pay attention to material explanations. The steps of the learning exercises were less diversified, with simply lectures and questions and answers being employed. Furthermore, there was a lack of utilization

of media in communicating educational content, which prevents pupils from fully absorbing the material. It was obvious in the student learning results in the assessment activities completed at the end of the learning activities, which were inadequate.

During the academic year 2021-2021, many students at Kepahiang 03 State Elementary School were uninterested in learning reasoning on natural change content, which had a detrimental influence on the students' learning results. According to the teacher, pupils frequently struggled in learning activities to achieve fundamental skills and knowledge of prescribed learning materials. Students find thinking about the subject of natural change challenging since it is abstract. The fact that underlies the less-than-optimal acquisition of learning outcomes is due in part to the selection of learning models that do not highlight the scientific process, resulting in learning that is less meaningful and information learned that is only stored in short-term memory. As a result, it is vital to select a learning model that fits the characteristics of pupils, one of which is the 7E learning cycle model.

Facts, ideas, hypotheses, and theories are the building blocks of natural science. Science education is critical to a country's economic and technical progress (Ilhamdi *et al.,* 2021). Science learning in elementary schools is a type of learning that prepares pupils to exercise process skills based on their cognitive development stage. Natural Science (IPA) is a creative process that seeks diverse origins and consequences of various phenomena that investigate the world and its contents, as well as the events that occur in it, which were established by specialists via a succession of scientific procedures carried out meticulously (Setyawan & Kristanti, 2021). This might be viewed as scientific learning aimed at discovering and training pupils to develop an awareness of their life-oriented surroundings.

There are three aspects to studying the nature of science as a process, product, and attitude development. Scientific products are facts, concepts, principles, hypotheses, and laws, whereas the science process is the procedure through which professionals find science products. The scientific method includes a way of working and thinking (Handayani, 2020). This might be seen as the science learning process training students to think critically and solve issues in everyday life.

Students are required to know natural information in everyday life in science topics; this science learning needs skills, creativity, and comprehension (R. Wulandari

et al., 2021)dalam bentuk Nonequivalent Pre-test and Post-test Control Group Design. Populasi dalam penelitian ini adalah seluruh siswa kelas IV SD Torsina III Singkawang. Sampel diambil menggunakan teknik non probability dengan jenis sampling jenuh. Teknik pengumpulan data menggunakan teknik tes berupa tes objektif materi bunyi dan teknik non tes berupa angket respon. Hasil penelitian menunjukkan bahwa: (1. As previously said, science focuses on acquiring the capacity or competence of an ability to grasp the natural environment scientifically through real-world experiences (Arif & Muthoharoh, 2021)China, is the starting point for the transmission of the Covid-19 virus. Severe Acute Respiratory Syndrome Coronavirus-2 which causes the Covid-19 virus to spread globally to Indonesia. The World Health Organization says that the Covid-19 virus can spread quickly and its effects span all aspects. The impact and prevention efforts in Indonesia require that all activities from studying, working and worshiping be carried out at home. The government urges the public to do social distancing, which means no crowd of 5 people is allowed. The impact on education requires learning without face to face so that in responding to this the teacher is advised to use distance learning. Renewal of distance learning can take advantage of cyber systems. One of the uses of cyber systems is the powtoon media. Powtoon media can develop 21th century skills, namely the ability to represent and learn without time and space boundaries. This study aims to develop powtoon-based learning media in improving the ability of science representation. Stages of developing media 1. In other words, in order to learn, kids want a learning paradigm that can deliver direct and relevant experiences.

The 7E learning cycle model is one of the learning models that adhere to the features of the curriculum 2013 (Nango *et al.,* 2021). Constructivism learning is a 7E learning cycle. Several studies have demonstrated that 7E cycle learning is superior to other types of learning (Jati *et al.,* 2017). Science learning utilizing the 7E learning cycle model is an alternate paradigm that engages students in learning, making it more relevant. The learner-centered learning paradigm is followed in Learning Cycle 7E. (Rawa *et al.,* 2021). In keeping with this, the Learning Cycle Approach is a constructivist-based student-centered learning model (Nabilah *et al.,* 2019)the mathematical connection ability of senior high school students is not quite good, thus a learning models is needed to improve mathematical connection ability. The purposes of the research are; (1.

The 7E learning cycle model allows students to absorb knowledge by investigating their surroundings, accommodate information by constructing a concept, organize information, and link new concepts by utilizing or expanding the concepts they already have to explain a different phenomena (Ramadhani *et al.,* 2019). A constructivism-based learning approach, the learning cycle According to constructivism philosophy, knowledge is actively generated by pupils rather than conveyed straight from professors (Rusydi & Kosim, 2018). In accordance with this, Learning Cycle 7E is a learning paradigm for developing students' reasoning skills through investigative processes, resulting in the formation of scientific conceptions (Rohaniyah and Utiya Azizah, 2017).

The 7E learning cycle model is based on Vygotsky's social constructivism and Ausubel's meaningful learning theory (Yusra Amaliyah Harahap *et al.,* 2018). Accordingly, the 7E learning cycle model stresses students' assumptions as a foundation for acquiring new knowledge. So that the 7E cycle learning model implementation may accommodate students who have conceptual mastery (Irsyad & Linuwih, 2018). The learning cycle describes how people learn from their experiences. Moderate learning cycles can be used to create teaching materials such as lesson plans and worksheets (Adnyani *et al.,* 2018)64.

Learning the 7E cycle model can also influence students' science process skills since this model allows students to take an active role in their learning (Khairani *et al.,* 2021). It is believed that by using the Learning Cycle model, students would not only listen to the teacher's explanation, but will also take an active role in investigating, analyzing, and assessing their grasp of the subjects being covered (Muthma'Innah *et al.,* 2019). Deductive reasoning tasks are involved in learning with the 7E learning cycle model. Students are instructed to think about basic concepts before moving on to more detailed concepts (Firdaus *et al.,* 2017)

Through the stages of the learning process, the 7E Learning Cycle Model encourages students to be engaged and develop knowledge (Krisnawati *et al.,* 2021). According to this learning model, the learning process can include students in active learning activities, resulting in a process of absorption, adaptation, and organizing in students' cognitive structures (Adnyani *et al.,* 2018)64. This can prepare pupils for the demands of the twenty-first century, which need students to acquire more than just concepts and facts. Students must be able to think critically and learn in order

to graduate. Critical thinking ability is a component of rational thinking and may be defined as the capacity of pupils to grasp concepts well and use the information they have to make judgments in problem solving (Dewi *et al.,* 2017).

The function of the teacher in the 7E learning cycle model as facilitator and mediator of learning (Bili *et al.,* 2020). The primary aim of the 7E Learning Cycle is to highlight the increasing importance of provoking previous understanding and transferring the concept to new contexts (Balta & Sarac, 2016).

According to (Qarareh, 2012) the 7E learning cycle is an active cognitive process in which students go through many exploratory educational experiences that allow him to study knowledge designed for human cognition. Learning cycle 7E is an innovative learning paradigm that can help students develop their own knowledge so that they can subsequently enhance their problem-solving abilities (Lestari & Rosdiana, 2018).

The 7E learning cycle model has several advantages, including stimulating students to remember previously learned subject matter, motivating students to be more effective and increasing student curiosity, training students to learn concepts through experimental activities, and providing opportunities for students to think, seek, discover, and explain so that learning becomes more meaningful (Fatimah & Anggrisia, 2019); Dini Apriani, Atep Sujana, 2013). In accordance with this, (Safitri & Noviarni, 2018) the 7E learning cycle model allows students to reflect about the ideas being learned in order to establish a social learning environment. Students are also guided to difficulties in everyday life that are relevant to the curriculum in order to increase their interest and understanding. What we did in this paper was different from previous finding such (Balta & Sarac, 2016; Firdaus *et al.,* 2017; Irsyad & Linuwih, 2018; Jati *et al.,* 2017)comprising 2918 students were included in the meta-analysis. The results confirmed that 7E learning cycle have a positive effect on students' achievement. The overall effect size (Hedges's g which emphasize on improving the learning outcome of reasoning.

METHODS

This study referred to a quasi-experimental design. This study was two groups and used (Kiswanto, 2017). One important aspect in an educational research activity

was determine the research approach. This research based on positivism philosophy which examine certain populations or samples.

In this study, we used a cluster sampling technique. The 41 sample were taken from Kepahiang 03 State Elementary School. The sample in this study consisted of all fifth-grade students for the 2021/2021 academic year. The sample was 41 students from two classes (class A and class B). Class V A has 21 students who use the 7E learning cycle model, whereas class V B has 20 students who used traditional learning. The data collection techniques used in this research were observation, interviews and tests. The test was carried out at the end of the lesson (posttest). The Learning Outcomes Test fulfilling the requirements of a good measuring instrument could produce good learning measurement results accurate. Before being tested, the research instrument could be trusted and feasible, we had to use a series of instrument test requirements were validity and reliability. The validity of the instrument in the form of a test must meet the validity of the construct and content validity. In this study, we used three experts as testers construct validity, namely the school principal, the lecturer and the class teacher at Kepahiang 03 State Elementary School. For content validity, we tested it on students at Kepahiang 03 State Elementary School who were not sampled study.

In this study, to test the reliability of research data was done using the SPSS program 18.0 for windows with level significance of 5%, if value Cronbach's Alpa > $r\text{-}tabl$e then the data were said to be reliable. In this study, we used quantitative data analysis techniques using the MANOVA test statistic using SPSS 18.0 for Windows. Before conducting hypothesis testing, what needed to be done was to do a prerequisite test, namely homogeneity and normality. After the data were homogeneous and normal, then test the hypothesis research using the MANOVA test.

RESULTS AND DISCUSSION

Here were experimental and control class. In experimental class was carried out on 6 hours of lessons or 3 times meeting, 4 hours of lessons were used to provide treatment of the 7E learning cycle model and 2 hours were used to provide posttest. While in the control class, 4 hours of lessons, 2 hours of lessons to deliver material and 2 hours' lesson to give a posttest. With regard to the test method, the posttest

questions were given amount to 5 questions the description was accompanied by the scoring provisions and before the instrument was distributed to several respondents (class students who became the research sample).

Before choosing the experimental and control classes, the homogeneity of data variance in the ability of students in both courses had to be tested. The raw score of scientific learning outcomes from the first semester of the 2021/2022 academic year was utilized for the homogeneity test. The data were analyzed using the SPSS version 22 program, and the Levene test findings are displayed in Table 1.

Table 1. Variant Homogeneity Results (N = 40)

Data	Statistics Levene	d*f*1	D*f*2	Sig.
Mean	0,026	1	40	0,873
Median	0,000	1	40	1,000

According to Table 1, the Levene F-test (1.40) = 0.026, p = 0.873, with a Sig value. (0.873) > 0.05, the variations of the two classes V A and V B (science learning outcomes data) are determined to be homogenous or the same. Because the data variance in the two classes is homogenous, the experimental and control classes are determined by lottery by using coins. The lottery with 100 rupiah coins agreed upon conditions are the number 100 for class V A as the control class (abbreviated A) and the picture of an eagle for class V B as the experimental class (abbreviated B). The number 100 (A) and the image of the eagle (B) came out with a combination of ABB, ABA, and BBA after the draw was carried out in the presence of two witnesses (we and supervisor), so it was determined that the control class was class V A with a total of 21 students and the experimental class is class V B with a total of 20 students.

Table 2. Experiment on Reasoning Pretest and Control Class

Dimension Level	Asymp. Sig (2-tailed) *		
	Pretest	Test Criteria	Conclusion H0
Reasoning	0,338	0,338 > 0,05	Rejected

According to the table, the Sig Mann-Whitney value at the pretest is 0.338> 0.05 (confidence level), whereas the Sig value in the posttest is 0.000 0.05. A table of posttest reasoning for the experimental and control classes is provided below:

Table 3. Posttest on Experimental and Control Class Reasoning

Dimension Level	Asymp. Sig (2-tailed) *		
	Posttest	Test Criteria	Conclusion H0
Reasoning	000	0,027 < 0,05	Rejected

* If Asymp. Sig (2-tailed) > 0.05, Ho is accepted and Ha is rejected; if Asymp. Sig (2-tailed) < 0.05, Ho is rejected and Ha is accepted.

According to the table, the Sig Mann-Whitney value in the pretest is 0.338 > 0.05 (confidence level), while the Sig value at the posttest is 0.027 < 0.05, indicating that H01 is rejected and Ha1 is accepted. This suggests that there is a difference in the average value of the experimental class's pretest and posttest on the cognitive dimension of reasoning. It is possible to conclude that employing the 7E learning cycle model has an influence on cognitive reasoning abilities.

The primary goal of this study was to see how the 7E learning cycle model affected the cognitive learning outcomes of fifth graders. The 7E learning cycle model allow students to maximize their learning techniques and build their reasoning skills by engaging them in active learning activities that might improve their learning results. comprehension of the material being studied (Aripin *et al.,* 2018; Fatimah & Anggrisia, 2019). This is consistent with constructivism theory, which holds that students must construct their own knowledge from what they have learned in order for the learning process to be more meaningful and students' critical thinking abilities to improve (Unaenah & Rahmah, 2019). This is also relevant with (Putu *et al.,* 2022) that critical thinking capacity is the fundamental skill for issue solving. As a result, the 7E learning cycle model may be used to develop reasoning and critical thinking abilities. The learning cycle model contains seven steps in its implementation. Elicitation is the process of increasing students' initial understanding through the use of questions that excite students' prior knowledge (Eisenkraft, 2003). Engage is a phase in which students' attention is focused, motivation for the subjects to

be taught is increased, and students are involved in group discussion activities. Exploration is the stage in which students work individually in small groups to solve challenges. During this phase, the instructor asks questions, gives input, and assesses student knowledge. Explain is the phase in which the instructor introduces new scientific language, students conclude and report their results, and the teacher offers comments on the student-proposed conclusions. Elaborate is the phase in which students are given opportunity to use their knowledge to solve issues related to the information that has been taught. The instructor examines pupils' knowledge of the subject they have learnt throughout the evaluation phase. Extend is a phase in which the teacher helps pupils in applying what they have learned in a new context by linking it to the following content (Widyaningsih *et al.,* 2018).

This study was done in the control and experimental classes, with each meeting twice with the topic of occurrences in everyday life (theme 7), KD. 3.7 analyzing the impact of heat on changes in the shape of ordinary items. We employed the 7E learning cycle model in the experimental class, whereas traditional learning was used in the control class. Reasoning was the cognitive learning capacity that was assessed. We used the 7E learning cycle model to build the cognitive learning outcomes of reasoning during the first encounter. We used the 7E learning cycle model to produce cognitive reasoning learning outcomes during the second meeting. This study's topic was given using the 7E learning cycle model of the cognitive learning dimension of reasoning.

Students anticipated experimental activities with bated breath since they are uncommon and novel to them. This is consistent with Alim's perspective (Burhaein, 2017) who believes that primary school pupils are eager to move and practice immediately. Children of elementary school age are not like adults who can sit for hours on end, but they do have the option of sitting quietly for a maximum of 30 minutes. Education plays a role in ensuring that learning is always dynamic. Then, primary school-aged youngsters have the traits of being content to practice things practically rather than conceptually.

In cognitive reasoning abilities, the data of the posttest mean value in the experimental class and the control class achieved the highest score. This was because, throughout the experimental activities, the students appeared to be extremely eager when preparing the equipment and supplies; at this point, the teacher had to

assist the pupils and ensure that everything went smoothly and safely. Furthermore, scheduling had to be addressed so that the anticipated material was obtained. The findings of hypothesis testing on pretest and posttest scores revealed that employing the 7E learning cycle model had a substantial influence on cognitive reasoning abilities in scientific learning for class V Elementary School.

This is consistent with studies (Marfilinda, 2019) indicating that the Learning Cycle approach can improve students' critical thinking abilities in primary scientific learning. This is supported by study findings (Nur & Noviardila, 2021), which show that employing the Learning Cycle model can improve primary school students' learning outcomes and enable thematic learning objectives to be met. In accordance with this, the 7E Learning Cycle model's effect can increase student learning results for basic science ideas (Marfilinda *et al.,* 2020).

Furthermore, study (E. Wulandari *et al.,* 2022) demonstrates that the interactive PowerPoint-assisted 5E learning cycle model has an influence on the learning outcomes of single and mixed substance scientific learning for SD Al-Madina fifth grade students in 2020/2021. According to study (Istuningsih *et al.,* 2018)Central Java, Indonesia. The sampling technique used was purposive sampling while the data-collection technique was using test, that are pre-test and post-test. The data test were then analysed using t-test (Independent Simple t-test, a scientific approach to learning utilizing e-modules based on the 7E learning cycle can increase student learning outcomes in high school.

The data analyzed in this study were data on students' creativity in solving problems and learning outcomes of the two sample groups. Assessment of creativity was taken from the process of solving problems given posttest questions while the assessment of learning outcomes was known from the value obtained by each student. Student creativity in solving problems was categorized into several assessments which will be presented in the following table:

Table 4. Assessment Category

Score	Level	Character
17-20	Level 4 (very creative)	Students are able to demonstrate fluency, flexibility, and novelty or novelty and flexibility in solving problems
13-16	Level 3 (creative)	Students are able to demonstrate fluency and flexibility in solving problems
9-12	Level 2 (quite creative)	Students are able to show novelty or flexibility in solving problems
5-8	Level 1 (less creative)	Students are able to demonstrate fluency in solve the problem
0-4	Level 0 (not creative)	Students are unable shows the three aspects of indicators of creative thinking

While the value of learning outcomes obtained by each student will be in the form percent presented in table:

Table 5. Learning Outcome

Level Mastery	Letter Value	Score	Predicate
86-100%	A	4	Very good
76-85%	B	3	Good
60-75%	C	2	Enough
55-59%	D	1	Not enough
≤ 54	TL	0	Less Once

This study analyzed the use of the 7E learning cycle model variable which had a statistically significant effect on cognitive reasoning abilities in science learning of the fifth grade students at Kepahiang 03 State Elementary School. For this reason, it is recommended for further research developed with linkages between variables that are interactive, as well as position certain variables. This research is inseparable from limitations and weaknesses. A number of These limitations are

expected to be overcome in subsequent studies, those limitations. among others: research data originating from the perceptions of the respondents conveyed in writing of a questionnaire instrument might affect the validity results. Respondents' perceptions do not necessarily reflect the actual situation and will be different if the data obtained by interview.

After the validator stated that the question was feasible to use, the question was tested on 10 students who were not included in the research sample. Apart from being based on expert validation, the instrument validation test was also tested manually and also using the help of SPSS version 18.0 to find correlations between parts of the measuring instrument as a whole by correlating each item with the total score of each item using the Pearson Product Moment formula. In this posttest, we tested it on the class so that students' creativity values were obtained using manual calculations with 10 respondents presented in the following table:

Table 6. Manual Calcu]ations of Respondents

Respondents	Question				
	1	2	3	4	5
F	3	3	3	2	3
D	2	3	3	3	2
B	4	4	4	4	4
V	2	2	2	2	3
R	2	3	3	2	2
L	4	4	3	4	4
I	4	4	4	4	4
A	2	2	1	2	2
T	3	2	2	2	1
M	2	4	4	4	4

After getting the results, then calculated using a validity test to determine whether the question was valid or not. The validity test calculation was done manually and with the help of SPSS version 18.0. The steps to test the validity of the question instrument with manual calculations were as follows:

1. Determine the total score of creativity results presented in the following table:

Table 7. Score of Creativity Results

Respondents	Question					Total
	1	2	3	4	5	
F	3	3	3	2	3	14
D	2	3	3	3	2	13
B	4	4	4	4	4	20
V	2	2	2	2	3	11
R	2	3	3	2	2	12
L	4	4	3	4	4	19
I	4	4	4	4	4	20
A	2	2	1	2	2	9
T	3	2	2	2	1	10
M	2	4	4	4	4	18

2. Calculating r-table

Based on the table above, n = 10 is obtained, the value of r table with α = 0.05 in the product moment table = 0.632

3. Calculating the value of r count on each item questions

If r-count ≥ r-table, then declared valid

If r-count < r-table, then declared invalid

a. Test the Validity of Question 1 (creativity)

1) Create an auxiliary table to simplify calculations as presented in table as follows:

Table 8. Test the Validity Question

Respondents	X	Y	XY	X^2	Y^2
F	3	14	42	9	196
D	2	13	26	4	169
B	4	20	80	16	400
V	2	11	22	4	121
R	2	12	24	4	144
L	4	19	76	16	361

I	4	20	80	16	400
A	2	9	18	4	81
T	3	10	30	9	100
M	2	18	36	4	324
Amount	28	146	434	86	2296

From the data posttest results, the average class value can be obtained experiment of 8.57 and the control class of 7.21. Based on the average value, it can be seen that the value of the experimental class is high. As for the control class obtain an average that is classified as moderate. Based on the analysis results shows that there are differences in scores in the experimental class which uses the 7E learning cycle model method with the control class using the lecture method.

Table 9. SPSS Output Test the Validity of Creativity Correlations

		x1	x2	x3	x4	x5	Total
x1	Pearson Correlation	1	.580	.462	.584	.527	.713*
	Sig. (2-tailed)		.079	.179	.077	.117	.021
	N	10	10	10	10	10	10
x2	Pearson Correlation	.580	1	.906**	.906**	.819**	.962**
	Sig. (2-tailed)	.079		.000	.000	.004	.000
	N	10	10	10	10	10	10
x3	Pearson Correlation	.462	.906**	1	.775**	.701*	.878**
	Sig. (2-tailed)	.179	.000		.008	.024	.001
	N	10	10	10	10	10	10
x4	Pearson Correlation	.584	.906**	.775**	1	.802**	.931**
	Sig. (2-tailed)	.077	.000	.008		.005	.000
	N	10	10	10	10	10	10
x5	Pearson Correlation	.527	.819**	.701*	.802**	1	.888**
	Sig. (2-tailed)	.117	.004	.024	.005		.001
	N	10	10	10	10	10	10

Total	Pearson Correlation	.713*	.962**	.878**	.931**	.888**	1
	Sig. (2-tailed)	.021	.000	.001	.000	.001	
	N	10	10	10	10	10	10

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

This can be seen from the significant value obtained, namely 0.024 <0.05. So it can be concluded that there is an influence of the 7E learning cycle model on grades A and B of at Kepahiang 03 State Elementary School. From the posttest results data, it can be obtained the average value of class learning outcomes experiment of 74.04 and the average value of the control class learning outcomes of 67.04. Based on the average value it can be seen that the value of the results students' learning mathematics in the experimental class is relatively high even though there are some students whose grades are below the Minimum Completeness Criteria. As for the control class obtain an average that is classified as moderate although there is also a value under Minimum Completeness Criteria. Based on the analysis results show that there is the difference in the value of learning outcomes between the experimental class using the 7E learning cycle model with a control class using the lecture method. This can be seen from the significant value obtained, namely 0.021 <0.05. So, it can be concluded that there is an influence of the 7E learning cycle model on the learning outcomes of class A and B students at Kepahiang 03 State Elementary School.

Table 10. Value of Student Learning Outcomes Try Out 10 Respondents

Respondents	Question				
	1	2	3	4	5
F	18	14	14	20	23
D	16	14	14	23	18
B	20	15	15	25	25
V	16	14	14	20	20
R	20	15	14	25	25

L	20	15	15	25	25
I	16	14	14	23	25
A	20	14	14	20	18
T	16	15	14	20	20
M	18	15	15	25	25

The next test was the instrument reliability test. To carry out the reliability test as well as the validity test, the test instrument was first tested on 10 class VIII students who had studied line segment comparison material. The results obtained from the trial were then tested for reliability using the Cronbach alpha formula with the following steps. The steps for manual reliability testing of students' creativity values are as follows:

Table 11. Manual Reliability Testing of Students' Creativity

Respondents	X1	X2	X3	X4	X5	(X1)2	(X2)2	(X3)2	(X4)2	(X5)2	∑ *X*	∑ *X*2
F	3	3	3	2	3	9	9	9	4	9	14	196
D	2	3	3	3	2	4	9	9	9	4	13	169
B	4	4	4	4	4	16	16	16	16	16	20	400
V	2	2	2	2	3	4	4	4	4	9	11	121
R	2	3	3	2	2	4	9	9	4	4	12	144
L	4	4	3	4	4	16	16	9	16	16	19	361
I	4	4	4	4	4	16	16	16	16	16	20	400
A	2	2	1	2	2	4	4	1	4	4	9	81
T	3	2	2	2	1	9	4	4	4	1	10	100
M	2	4	4	4	4	4	16	16	16	16	18	324
Total	28	31	29	29	29	86	103	93	93	95	146	2296

From the posttest results data, using the MANOVA test has been it is known that the output of Box's test of equality of covariance matrices with values significant from the covariance result of 0.071, because the significant value is

more than 0.05 so that the two data have the same covariance. Next, on the output of Levene's test of equality of error variances is known to have a significant value test of variance for the variable value of 0.109 and the value of learning outcomes of 0.581. The significant value of both is more than 0.05 so it is significant all have the same variance. Then, from the output of the Multivariate tests it is known that the class is significant on Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root has the same value that is equal to 0.042. Significant value is 0.042 <0.05, then H0 rejected. This means that there is an influence of the 7E learning cycle model on creativity and the learning outcomes of class A and B students at Kepahiang 03 State Elementary School.

The first prerequisite test in the hypothesis proving step was the homogeneity test. The homogeneity test was used to determine whether the two groups used as the research sample were homogeneous or not. The data to be used for this homogeneity test was data on odd semester report cards for class A and B students which are presented in the following table:

Table 12. Odd Semester Grades

Experiment Class			Control Class		
No	Code	Score	No	Code	Score
1	B1	80	1	C1	78
2	B2	79	2	C2	77
3	B3	78	3	C3	79
4	B4	80	4	C4	78
5	B5	81	5	C5	82
6	B6	83	6	C6	81
7	B7	79	7	C7	80
8	B8	83	8	C8	82
9	B9	84	9	C9	79
10	B10	83	10	C10	78
11	B11	79	11	C11	82
12	B12	79	12	C12	81
13	B13	81	13	C13	80
14	B14	81	14	C14	79
15	B15	81	15	C15	77
16	B16	85	16	C16	77

17	B17	82	17	C17	81
18	B18	82	18	C18	80
19	B19	80	19	C19	81
20	B20	81	20	C20	81
21	B21	82	21	C21	78
22	B22	80	22	C22	79
23	B23	79	23	C23	79
24	B24	82	24	C24	78
25	B25	83	25	C25	78
26	B26	83	26	C26	78
27	B27	82	27	C27	78
28	B28	81	28	C28	78
29	B29	84	29	C29	79
30	B30	81	30	C30	79

Report value data in the table above, then tested for homogeneity. Homogeneity testing was carried out manually and using SPSS version 18.0.

CONCLUSION

The use of the 7E learning cycle model had a statistically significant effect on the cognitive ability of reasoning in science learning for the fifth grade elementary school students, the activity of students who receive the 7E Learning Cycle was better than students who received conventional learning, and most students had a positive attitude toward the 7E learning cycle. The following recommendations are based on the research that has been conducted: 1) because the 7E learning cycle model contains phases, effective time management is required; 2) before engaging in learning activities based on the 7E learning cycle model, the instructor should first present a simulation; and 3) students must adhere to the stated time restriction when completing the steps of the 7E learning cycle model. This study only limited to the 7E Learning Cycle and cognitive skill of student for reasoning. The next researcher should have more about other variables which determine the cognitive skill student for reasoning. This study implies to the teachers for more giving attention about the 7E Learning cycle where they would have good cognitive skill of students.

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