

The Effect Of The Pair Checks Model On Learning Outcomes And Critical Thinking Ability In Class Iv Elementary School

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ARTICLE INFO

Keywords:

Critical Thinking Ability;
Learning Outcomes;
Pair Checks

Article history:

Received 2022-01-01

Revised 2022-04-11

Accepted 2022-06-02

ABSTRACT

The research aims to review (1) the impact of the Pair Checks type cooperative learning model on students' thinking ability compared to conventional lessons in thematic lessons of fourth-grade elementary school, (2) the impact of the Pair Checks model on student achievement compared to conventional lessons in fourth-grade thematic lessons of elementary school, (3) the thinking ability of students who are taught based on the cooperative model of the Pair Checks type are high compared to the thinking ability of the students who are taught based on conventional learning, and (4) the relationship between learning achievement and thinking ability seen from the cooperative model of the type of Pair Checks. The critical thinking ability studied is critical thinking ability taught in an integrated manner. The place of research is SDN 08 Mandeh. The research method used was quasi-experimental with design research in One group pre-test and post-test design. The sample applied was class IVA, with 23 students. The information was collected by using a written exam. The data obtained are as follows (1) the thinking ability of students who apply the cooperative model are significantly higher than the thinking ability of students in learning using conventional methods because there is $T_{\text{count}} = 1.78 > T_{\text{table}} = 1.68$ until H_0 is rejected and H_1 is accepted, (2) student achievement in learning that applies the cooperative model is significantly higher than student learning outcomes in learning using conventional methods because there are $T_{\text{count}} = 2.02 > T_{\text{table}} = 1.68$ until H_0 is rejected and H_1 is accepted, (3) critical thinking ability of students are being taught based on the Pair Checks model, it is higher than the thinking ability of students in conventional lessons because based on low initial knowledge at a level of 0.05, it is found that $T_{\text{count}} > T_{\text{table}}$ with $0.178 > 1.68$ until H_0 is rejected and H_1 is accepted, and (4) there is a relationship between learning achievement and students' thinking ability on the pair checks model because there is a significant effective

contribution between learning achievement and thinking ability with a percentage of 87.6% and the remaining 12.4 is influenced by other factors.

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1. INTRODUCTION

The development of science and technology can produce individuals who have ability in education (Azrianti & Sukma, 2020). Education is a form of development in society that is reviewed based on quality education. According to Hamalik (2013), "quality education is reviewed based on society literacy education as a stage in increasing students' knowledge and insight so that there is a change in the actions and behavior of students under educational goals.

The curriculum used at the elementary level is the 2013 curriculum which uses subject-oriented integrated learning. The 2013 curriculum is a curriculum that integrates abilities, themes, concepts, and topics that are formed in a single discipline, contains several disciplines, and contains several lessons (Miaz & Susanti, 2020). One of the recommended curriculum implementation models at the education unit level is the implementation of thematic teaching and learning processes. The integrated teaching and learning model applies themes to connect different topics and present memorable experiences to students (Amris & Desyandri, 2021). The 2013 curriculum in Elementary School is a curriculum with integrated thematic learning, where learning is connected by a theme that functions as a subject binder. Through this theme, teachers can develop integrated thematic learning and link the problems that arise in the learning with real-life so that students are trained to be more active and creative in solving problems in accordance with real life (Miaz & Gustiani, 2021). According to Hamalik (2013), in general, the growth and development of students are reviewed based on two aspects: talent and environment.

Education has a role in the survival of individual lives. Education has two crucial elements that influence each other such as the talents possessed by students from birth and the environment that influences them until that talent grows and develops in increasing personal understanding. Educational institutions are formal institutions that design education to increase students' understanding and insight so that they can compete with others in the future. Education can improve and involve students during the learning process, providing new experiences for students in developing their knowledge. With education, students can solve and solve the problems they face. In addition, education aims to produce quality students who can compete in various aspects.

In the thematic learning process, instruments are needed that can support the implementation of the learning process based on the material to be delivered and pay attention to the interests and environment of students. Teachers are a sub-part in achieving the goals of Indonesian education. The teacher's role in a good learning strategy will have positive implications for the learning process in schools (Tebo et al., 2021). Based on the opinions of several experts above, it can be concluded that education has an essential role in the survival of human life. Nevertheless, the two elements are equally important. However, there is a possibility that growth and development are affected by talent alone or environmental influences, and learning is an activity that a person does intentionally in a conscious state to acquire a new concept, understanding, or knowledge. Learning allows a person to experience relatively permanent changes in behavior both in thinking, feeling, and acting. Learning

can be interpreted as making people learn from not knowing something to making people aware of something relatively new.

The Curriculum 2013 has now been implemented in elementary schools to improve learning. The curriculum is used as a guide in achieving lesson objectives where the curriculum is designed to be maximally applied in the world of education in Indonesia (Sari et al., 2020). The Curriculum 2013 is an idea designed to improve and build character and build beliefs that can develop understanding. The curriculum was assisted by the minister of education and culture in 2013 and revised in Regulation of the Minister of Education and Culture of the Republic of Indonesia (Permendikbud) No. 24 of 2015 applied in the world of education (Reflianto & Syamsuar, 2018). The revision of the curriculum is focused on the learning stages that involve students in critical thinking ability that have a balance in affective and psychomotor aspects. When thinking, students apply their thinking ability carefully to solve their problems (Rachmadtullah, 2015). Critical thinking is an individual skill in expressing ideas and solving problems by studying and seeking information about the problems presented and should already exist in grade 4, 5, and 6 elementary school students. Maximum ability in affective, cognitive, and psychomotor aspects in 21st-century lessons are to produce students who are able to compete in the future by applying creative and innovative technology and instruments in problem-solving (critical thinking), communication, and research (Heinich et al., 2012).

Thus, a suitable model of student-oriented learning is needed to balance the 21st century with the 13th curriculum. To achieve this goal, the 2013 curriculum applies creative learning. In other words, lesson ideas can increase student participation in development and the development of insights that lead to change (Nur & Fitria, 2020). Improper application of learning models can result in student saturation during learning activities so that learning materials cannot be delivered as expected (Nadhirah & Fitria, 2020). Learning models in accordance with teaching materials can achieve the expected goals so that students have knowledge and insight into solving the problems they face (Trianto, 2010: 51). Therefore, educators can support the learning process implementation for students by using the pair check type model. This model is required so that students can express opinions and solve the problems they face. From several definitions of learning, according to some of the expert opinions above, learning is an interaction in the learning and teaching process that is carried out between teachers and students directly or indirectly.

The ability to think critically starts from the ability to read critically (Sundahry et al., 2019). In integrated Thematic Lesson activities, an ability that must be improved in achieving 21st-century is critical thinking ability when solving problems. Integrated thematic learning in its implementation must follow integrated thematic characteristics that are student-oriented, detailed lesson content separators, present concepts from different learning content, flexible, and develop learning outcomes based on student needs to produce quality lessons (Djononiarjo, 2020). In integrated thematic learning, the teacher must connect one subject to another subject that is bound without being felt by the students that there is a change in the subject in the ongoing learning process (Miaz, 2013). Critical thinking ability are assigned to students in their critical thinking when solving a problem (Hasnan & Fitria, 2020). The curriculum revision in Indonesia occurs due to an evaluation of the previous curriculum to achieve perfection in achieving learning goals (Indriyani et al., 2019). The curriculum 2013 aims to prepare individuals skilled in solving problems (Indonesia et al., 2013). The curriculum also supports students to have ability in transmitting good problems (Desnarita, 2019).

Thinking is a form of a question posed by individuals. In other words, thinking is a stage of asking questions about an idea that can improve understanding in the learning process and is also a stage in optimizing students' critical thinking ability, especially in teaching materials and logical language application in testing a discipline. The knowledge can produce students' understanding and good character (Fakhriyah, 2014). Critical thinking ability enable people to examine their own opinions, demonstrate consistency, and generalize by evaluating differing evidence and interpreting experiences faced rationally. Critical thinking ability are an essential tool to make them evaluate opinions about the situation at hand (Polat & Aydın, 2020). In the literature, the epistemological

shortcomings of learning outcomes models appear in the discipline's subject matter, but further aspects come into play when expectations regarding students' critical thinking are added (Erikson & Erikson, 2019). From the opinions of the experts above, it can be concluded that critical thinking ability can also be interpreted as an action in assessing a problem or opinion with an investigative process to obtain the best answer so that someone who has critical thinking ability tends to be a critical thinker to find new ideas.

A teacher can make several efforts to support students' good knowledge of concepts. One of them is by applying a learning model based on the character of students and teaching materials (Yerizon et al., 2020). Responding to these problems as objects directly involved in learning activities should submit appropriate learning models so that learning activities can produce an understanding in students (Di & Dasar, 2017). Students can choose the appropriate learning model based on teaching materials. This is because the application of the model supports achieving teaching goals as expected by educators (Tema et al., 2020). Based on the experts' opinions above, it can be concluded that the applied learning model will support the smooth learning process. It requires students' independence and ability to solve problems and trains students' social responsibility, cooperation, and ability to give assessments.

From the observations of researchers conducted in class IV SD Negeri 08 Mandeh Kab. Pesisir Selatan, Kec. Koto XI Tarusan Kab. Pesisir Selatan on May 24, 2021, with the theme 7 sub-themes 1 lesson 4 about "The Beauty of the Diversity of My Country (Indahnya Keberagaman Negeriku)" in Indonesian language learning about KD. 3.7 "Exploring New Knowledge (Menggali Pengetahuan Baru)" contained in the text. The researcher also saw that students faced difficulties understanding a reading text to gain new knowledge and were less able to solve problems in every question given by the teacher. This is because the teacher only provides reading text and asks students to read the reading text without explaining how to understand the reading text so that students are less able to find new knowledge in the reading text. Students' critical thinking abilities have not been seen, and they are less active in the learning process because students tend to be silent and still afraid of being wrong in expressing opinions. Hence, students are less skilled in critical thinking, and learning outcomes are also not good. It can be seen when the teacher asks for a response from the group, but there are still many who rely on the answers in the book, and it is difficult to explain in their minds, so the discussion becomes bored and uninspired and causes students to be busy with their activities and go in and out during the learning process. This can also be seen from the score of students who have not met the minimum completeness criteria (KKM) applied, which is 70.

An idea that can develop learning achievement is seen from students' critical thinking in integrated thematic lessons, namely by applying one of the pair checks learning models. Cooperative learning is a learning stage that produces interactions so that student learning references are not only from educators but students as well. Huda (2015:29) explains that cooperative learning is a group lesson based on the principle of responsibility for the presented problems that can create critical thinking in solving them (Ilmiah & Pendidikan, 2010). Based on the experts' opinions above, it can be concluded that cooperative learning is a philosophy of personal responsibility and respect for others, where the teacher explains the concept and the students are divided into several teams. Each team consists of 4 people; there are 2 pairs in one team.

Referring to previous research and strengthened by research conducted by Safitri (2020), critical thinking ability using a pair checks type cooperative model have better learning outcomes in teaching students compared to critical thinking ability using conventional models. Research from Savitri (2020) also proves that using a pair checks type of the cooperative model is better in teaching students than using mathematical critical thinking ability using conventional models. Research from Hadyanta (2013) explains that the pair checks model can improve students' critical thinking ability. Meanwhile, research from Mukarromah (2018) states that the critical thinking ability of elementary school students increases after receiving treatment with the application of the discovery learning model based on the implementation of thematic learning. So, it was concluded that overall fourth grade

students at SDN 1 Mara in the even semester of the 2017/2018 academic year had high critical thinking ability.

The pair checks learning model is a model that teachers can apply in providing subject matter and controlling students. The integrated thematic teaching and learning process based on the Pair Checks model can review a need that stimulates students to carry out the learning process actively and foster critical thinking ability in problem-solving (Arifin & Aprisal, 2020). From the expert opinion, it can be concluded that the cooperative model of pair checks type is a model in which students work in pairs in groups to work on the questions given.

By paying attention to the nature of the Pair Checks cooperative learning model, the teacher is required to map the possibility of students being able to think critically on their own with the activities that students go through during learning. Through this research, the researcher applies the Cooperative Model of Pair Checks Type. This learning model is carried out in groups of 4 divided into pairs (Dhewy et al., 2020). From several opinions about the cooperative model of pair checks type, this learning model also trains students' social sense, cooperation, and ability to give assessments that aim to improve students' ability to express ideas, thoughts, experiences, and opinions correctly. One solution that can be used to improve learning outcomes is seen from students' critical thinking in integrated thematic learning, namely by using a pair checks type cooperative learning model in each lesson by being responsible for their learning and being encouraged to improve the learning of other members.

2. METHODS

This research is a type of experimental research. Sugiyono (2009:107) states that experimental research is research that applies findings to impacts based on circumstances that occur. The research was carried out in Class IV SDN 08 Mandeh Kab. Pesisir Selatan. This quantitative research uses *one group pre-test & post-test design*. Before treatment, a pre-test sample was given in this design and ended with a post-test. Likewise, in the pre-test, the process is presented in the form of proposed exercises based on the achievement of critical thinking ability (Ahmad Farisi, Abdul Hamid, 2017). The design is applied to the achievement of lesson objectives, the development of students' critical thinking ability, and the acquisition of student achievement in integrated thematic learning. Below is a *one-group pre-test and post-test design* chart in chart 1.

Table 1. Research Design of *one group pre-test and post-test design*

Pre-test	Treatment	Posttest
O ₁	X	O ₂
O ₃	-	O ₄

Source: Sugiono (2012:111)

Note:

O1: Pre-test before treatment is given

O3: Pre-test before treatment is given

O2: The final test (Post-test) after the treatment is given

O4: The final test (Post-test) after the treatment is given

X: The treatment of the experimental group is by applying Pair checks.

At the research time, the community was all fourth-grade students at SDN 08 Mandeh in the 2021/2022 academic year. Pesisir Selatan Regency consists of two classes. The number of fourth-grade students at SD Negeri 08 Mandeh, Kab. Pesisir Selatan is illustrated in this chart

Table 2. Number of fourth-grade students at SD Negeri 08 Mandeh Kab. Pesisir Selatan

No	Class	Total of Students
1	IV A	23 students
2	IV B	17 students
Total		40 students

Source: Homeroom Teacher IV SD Negeri 08 Mandeh, Kab. Pesisir Selatan

This study requires samples from two classes. The first sample is the experimental group taught using the pair checks model, and the second sample is the control group taught using the conventional method. So the sampling technique used is purposive sampling. In this technique, the sample is appointed based on considering the cognitive learning outcomes of the two classes. The sampling method used was purposive sampling for class IV A students. In the experimental class, 23 students were found. The way to collect information is by applying the test (Pre-test & Post-test) and documentation. The research media is a written test in multiple-choice with 50 questions consisting of questions C4 – C6. In applying the media, planning is needed that refers to validity, practicality, and the index of difficulty of the exercise.

Validity is a media depiction that is applied in research. An exam is categorized as achieving validity by determining the teaching materials so that it is said to be curricular validity. The formula for calculating kVA is an exercise trajectory that applies the product-moment correlation formula.

Determining the validity of critical thinking ability test questions and learning outcomes carried out at SDN. 08 Mandeh can be seen in tables 3 and 4 below:

Table 3. Results of Calculation of the Validity of Critical Thinking Ability Test Questions

No. Test Question	Score of Sig.	Validity	Pearson correlation (r_{xy})	Criteria of Validity
1	0,001	Valid	0.642**	High
2	0,000	Valid	0.764**	High
3	0,000	Valid	0.787**	High
4	0,000	Valid	0.787**	High
5	0,000	Valid	0.679**	High
6	0,000	Valid	0.787**	High
7	0,191	Tidak Valid	0,283	Low
8	0,000	Valid	0.735**	High
9	0,000	Valid	0.680**	High
10	0,003	Valid	0.594**	Moderate

11	0,001	Valid	0.642**	High
12	0,765	Tidak Valid	0,066	Very Low
13	0,000	Valid	0.764**	High
14	0,000	Valid	0.787**	High
15	0,103	Tidak Valid	-0,349	Invalid
16	0,047	Valid	0.418*	Moderate
17	0,962	Tidak Valid	0,010	Very Low
18	0,017	Valid	0.491*	Moderate
19	0,018	Valid	0.489*	Moderate
20	0,000	Valid	0.688**	High
21	0,794	Tidak Valid	0,058	Very Low
22	0,070	Tidak Valid	0,385	Low
23	0,000	Valid	0.787**	High
24	0,000	Valid	0.680**	High
25	0,003	Valid	0.594**	Moderate

Source: results from research data at UPT SDN 08 Mandeh.

The results of the calculation of the validity of the critical thinking ability test questions based on table 3.4, then the resulting valid questions are 19 items, with high criteria as many as 14 items, namely questions number 1, 2, 3, 4, 5, 6, 8, 9, 11, 13, 14, 20, 23 and 24. The questions with moderate criteria are 5 items, namely questions number 10, 16, 18, 19, and 25. The questions with low criteria are 2 items with question numbers 7 and 22. Very low criteria are as many as 2 items with numbers 12 and 17. Invalid questions are as many as 2 items, namely question numbers 15 and 21.

Table 4. Results of Calculation of the Validity of Learning Outcome Test Questions

No. Test Question	Score of Sig.	Validity	Pearson correlation (r_{xy})	Criteria of Validity
26	0,004	Valid	0.579**	Moderate
27	0,000	Valid	0.763**	High
28	0,000	Valid	0.711**	High
29	0,006	Valid	0.553**	Moderate
30	0,368	Invalid	0,197	Very Low
31	0,004	Valid	0.578**	Moderate

32	0,341	Invalid	0,208	Low
33	0,320	Valid	0,217	Low
34	0,159	Invalid	0,304	Low
35	0,980	Invalid	0,006	Invalid
36	0,007	Valid	0.545**	Moderate
37	0,499	Invalid	0,148	Very Low
38	0,000	Valid	0.763**	Low
39	0,192	Invalid	0,282	High
40	0,007	Valid	0.543**	Moderate
41	0,006	Valid	0.553**	Moderate
42	0,192	Invalid	0,282	Low
43	0,081	Invalid	0,372	Low
44	0,051	Invalid	0,412	Moderate
45	0,010	Valid	0.527**	Moderate
46	0,052	Invalid	0,410	Moderate
47	0,946	Invalid	0,015	Very Low
48	0,007	Valid	0.549**	Moderate
49	0,042	Valid	0.427*	Moderate
50	0,017	Valid	0.494*	Moderate

Source: results from research data at UPT SDN 08 Mandeh.

The results of the calculation of the validity of the test questions of learning outcomes based on table 4, then the resulting valid questions are 11 items with high criteria as many as 3 items, namely questions number 27, 28, and 38 while the questions with moderate criteria are 12 items, namely question number 26, 29, 31, 36, 40, 41, 44, 45, 46, 48, 49, and 50. Questions with low criteria are 5 items with question numbers 32, 33, 34, 42, and 43. Questions with very high criteria low as many as 3 items with the numbers are 30, 37, and 47. Invalid questions as many as 1 item with the question number 35.

Sudjana (2013:16) says that "evaluation reliability is conformity in the assessment. In other words, whenever a measuring instrument is applied, it obtains the appropriate achievement. The reliability test in this study applied the KR-20 formulation. Arikunto (2012:226) states that the discriminatory power of practice is training ability that can determine understanding or potential and the difficulty index of the questions.

Results of Reliability Critical thinking ability

Case Processing Summary

		N	%
Cases	Valid	23	100,0
	Excluded ^a	0	0,0
	Total	23	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
0,745	25

Conclusion: The reliability coefficient is 0.745 and the interpretation of the degree of reliability is moderate.

The stages of analysis were applied to descriptive and inferential research data. Descriptive statistics are applied in the review of a company, such as the mean, median, mode, and standard deviation obtained from the pre-test and post-test results. At the same time, the inferential calculation includes an analysis of normality rain that applies the Liliefors test and homogeneity test based on the F experiment. Data analysis aims to review the experimental and control classes to obtain conclusions based on hypotheses and statistically on students' Integrated Thematic learning. This research looks at the cognitive aspects of students' critical thinking ability—obtained statistics in the application of hypothetical experiments. Meanwhile, the hypothesis experiment applied was in the form of a T-test with the *paired simplest-test* formula.

After the normality and homogeneity tests were carried out, the hypothesis was tested. To test the hypothesis, the average similarity is used, provided that if the data is usually distributed and the two groups of data have homogeneous variance, then the t-test is used.

First Hypothesis

$$H_0: \mu A_1 = \mu A_2$$

$$H_1: \mu A_1 > \mu A_2$$

H0: There is no effect of the pair checks type cooperative learning model on integrated thematic learning outcomes seen from the critical thinking ability of fourth-grade elementary school students.

H1: There is an effect of the pair checks type cooperative learning model on integrated thematic learning outcomes seen from the critical thinking ability of fourth-grade elementary school students.

Second Hypothesis

$$H_0: \mu A_1 B_1 = \mu A_1 B_2$$

$$H_a: \mu A_1 B_1 > \mu A_1 B_2$$

H0: There is no effect of the pair checks type cooperative learning model on integrated thematic learning outcomes seen from the critical thinking ability of fourth grade elementary school students.

H1: There is an effect of the pair checks type cooperative learning model on integrated thematic learning outcomes seen from the critical thinking ability of fourth grade elementary school students

Third Hypothesis

$$H_0: \mu A_1 B_1 = \mu A_1 B_2$$

$$H_a: \mu_{A_1B_1} > \mu_{A_1B_2}$$

H0: The critical thinking ability of students taught using the Pair Checks type of cooperative model is the same as the critical thinking ability of students taught using conventional learning.

H1: The critical thinking ability of students who are taught with the Pair Checks type of cooperative model is higher than the critical thinking ability of students who are taught by conventional learning

Fourth Hypothesis

$$H_0: \mu_{A_1B_1} = \mu_{A_1B_2}$$

$$H_a: \mu_{A_1B_1} > \mu_{A_1B_2}$$

Note:

H0: There is no significant relationship between learning outcomes and critical thinking ability on the cooperative model pair Checks type

H1: There is no significant relationship between learning outcomes and critical thinking ability on the cooperative model pair Checks type

Shoimin (2014:119) suggests that the steps of the Pair Checks type of cooperative learning model are as follows: (1) Divide students in one class into groups of 4 students, (2) Divide groups of students into pairs. So in both pairs, there are pairs A and pairs B. (3) Give each pair a worksheet to work on. The worksheet consists of several questions or tasks (the number is even), (4) Next, allow partner A to work on problem 1 while partner B supervises, motivates, and (if necessary) guides Partner A while he is working. On question number 1, (5) then change roles, partner B processes question number 2, and partner A observes, motivates, and guides (if necessary) partner B in processing question number 2, (6) after 2 questions are resolved, partner reviews the results of their work together with other pairs who are in the same group as them, (7) each group that reaches an agreement (same opinion/problem solving/problem solving), (8) the teacher rewards the group that responds successfully, the teacher also can guide if both group members have difficulty. Steps 4, 5, and 6 are repeated to solve questions 3 and 4, and so on until all LKS questions have been completed.

This research was conducted in Class IV SDN 08 Mandeh Kab. Pesisir Selatan. This research was conducted in the first semester of the 2021/2022 academic year. This research starts from October 25 to November 25 for 2021-2022 at SD Negeri 08 Mandeh, Kec. Koto XI Tarusan, Pesisir Selatan Regency and lasts for one month.

This research was conducted at SD Negeri 08 Mandeh Kab. Pesisir Selatan, with the number of students in the experimental class (IV A) is 23 students consisting of 8 boys and 6 girls, and the number of students in the control class (IV B) is 17 students, consisting of 7 boys -men and 10 women. In particular, class IV-A as the experimental class and class V-B as the control class obtained primary data: the ability to think critically and student learning outcomes in learning theme 4 sub-theme 3. The study was carried out four times in class IV-A, which was used four times as an experiment, and in class IV-B, which was used as the control class.

Data on critical thinking ability consist of two parts; critical thinking ability from the initial test (pretest) and final test (post-test) in the experimental class and students' critical thinking ability from the initial test (pretest) and final test (post-test) in the control class. Likewise, learning outcomes consist of two parts; those are learning outcomes from the initial test (pretest) and final test (post-test) in the experimental class, and student learning outcomes from the initial test (pretest) and final test (post-test) in the control class. The final test data (post-test) is data obtained from both the experimental and control classes after being given treatment (treatment). The learning carried out in this research is integrated thematic learning in accordance with the 2013 curriculum. The study was conducted eight (8) times; four (4) times in the experimental class and four (4) times in the control class.

3. FINDINGS AND DISCUSSION

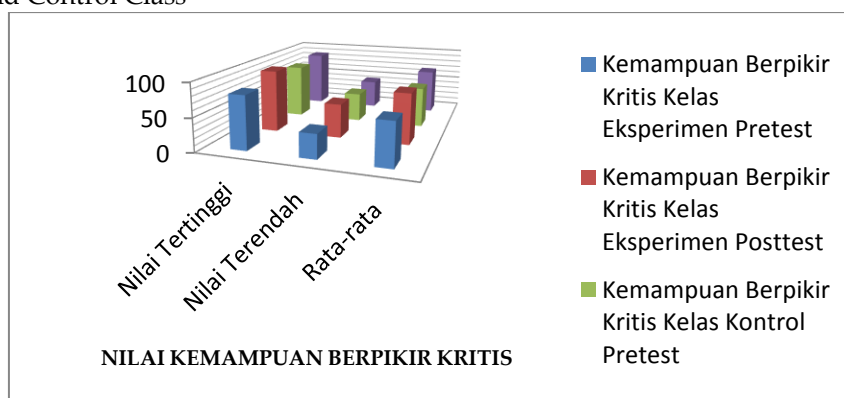
From the analysis obtained, the researcher discusses the achievements in this study obtained. The discussion is about (1) the impact of the Cooperative Pair Checks model on students' thinking ability, (2) the impact of the Cooperative Pair Checks model on student learning achievement, (3) The critical thinking ability of students who learn to use the Pair Checks model is higher than that of students' critical thinking ability who learn to use conventional methods, and (4) There is a link between learning achievement and thinking ability using the Pair Checks model

1. The Effect of Cooperative Learning Model of Pair Checks type on Students' Critical Thinking Ability

Before conducting the research, each class of the research sample was given a treatment. The experimental and control classes were given a pre-test (pre-test) of students' critical thinking ability to see if students had the same critical thinking ability. After that, the researcher gave treatment and a final test (post-test) on critical thinking ability. After being treated and analyzed, it can be seen that the effect of the Cooperative model of Type Pair Checks affects the experimental class. The results of data analysis from learning outcomes are strengthened by the results of hypothesis testing using the t-test. The variance with both samples is obtained for the real rate = 0.05 dk 41, so $t_{\text{count}} = 1.78$ While $t_{\text{table}} = 1.68$ because t_{count} is greater than t_{table} , then H_0 is rejected, and H_1 is accepted.

The comparison between the pre-test and post-test critical thinking ability scores in the experimental class and the control class can be seen in the following graph:

Graph 4.20 Comparison of the Highest, Lowest, Average Score of Critical Thinking Ability in the Experiment and Control Class



Based on the graph, it can be seen that the data from the critical thinking ability test before (pre-test) and after (post-test) on the Cooperative Type Pair Checks model in the experimental class and conventional methods in the control class obtained the average value of the initial test (pre-test) in the class. The experimental class was 64 higher than the pre-test control class (pre-test) of 60.94, while the post-test in the experimental class was 76.26 higher than the post-test control class of 69.06.

Through the one-way ANOVA calculation test, the analytical achievement of critical thinking ability in the pre-test and post-test is obtained in table 5. The results are shown in the following table:

Table 5. Hypothesis Results of Critical Thinking Ability Pre-test Experiment Class and Control Class

Critical Thinking Ability	Number of Variances	Average Square	Dk	Total of squares	T_{count}	T_{table}
Pre-test	Between Group	64	1	47643,1	0,64	1,68
	In Group		40			
		60,94		51726,2		
	Total		41			

Source: Pre-test Critical Thinking Ability Hypothesis Result Data

Based on table 5, the hypothesis test results for critical thinking ability on the initial first test (pre-test) in the experimental and control classes are $T_{count} = 0.64 < T_{table} = 1.68$, so H_0 is accepted, and H_1 is rejected. In other words, there are no differences found between the average scores of the experimental or control classes. Thus, the experimental and control classes had the same ability before being given the action.

After doing the pre-test, the post-test was carried out; Critical Thinking Ability Post-test Experiment and Control Class. The results can be seen in the following table:

Table 6. Hypothesis Results of Critical Thinking Ability Post-test Experiment and Control Class

Critical Thinking Ability	Number of Variances	Average Square	Dk	Total of Squares	T_{count}	T_{table}
Post-test	Between Group	76,261	1	35762,9	1,78	1,68
	In Group		40			
		69,059		48977,6		
	Total		41			

Sumber: Post-test Critical Thinking Ability Hypothesis Result Data

The table above shows that the results of hypothesis testing for critical thinking ability in the final test (post-test) in the experimental and control classes are $T_{count} = 1.78 > T_{table} = 1.68$, so H_0 is rejected and H_1 is accepted. In other words, differences were found in the experimental and control class, which means the critical thinking ability of students who applied the pair checks model was significantly higher than the students' thinking ability by implementing the conventional model.

2. The effect of the cooperative model of pair checks type on student learning outcomes

Student learning outcomes will be obtained when they have carried out the learning process. Learning outcomes are measured based on whether or not changes in behavior occur in someone who has carried out the learning process. Student learning outcomes are student achievements after experiencing learning activities. In this study, the effect of the Cooperative model of the Pair Checks type on student learning outcomes is determined from the comparison of the average value of student learning outcomes in the experimental class and control class, as well as the increase in student learning outcomes after participating in learning activities with the Cooperative model of the Pair Checks Type. in the experimental class and conventional learning in the control class.

The second hypothesis states that "the finding of the impact of the pair checks model on the achievement of student learning outcomes compared to conventional learning during class IV at SDN

08 Mandeh." Through the one-way ANOVA calculation test, the analysis was obtained in critical thinking ability (pre-test) or final exam (post-test) in table 7.

Table 7. Hypothesis Results of Pre-test Learning Outcomes Experiment and Control Class

Learning Result	Number of Variances	Average Square	Dk	Total of Square	T_{count}	T_{table}
Pre-test	Between Group	63	1	87922,9	0,37	1,68
	In Group		40			
	Total	60,765	41	177612,5		

Source: Hypothesis Result Data of Pre-test Learning Outcomes

Based on table 7, it is obtained in the hypothesis experiment on the learning outcomes of the initial test (pre-test) in the experimental and control classes, namely $T_{count} = 0.37 < T_{table} = 1.68$, so H_0 is accepted, or H_1 is rejected, which means that there is no difference in the mean value. The average is the experimental or control class. In other words, the two-class samples have the same ability before the action is taken.

After doing the pre-test, the post-test was carried out as well; Critical Thinking Ability Posttest Experiment Class and Control Class. The results can be seen in the following table:

Table 8. Hypothesis Results of Post-test Learning Outcomes for Experimental and Control Classes

Learning Result	Number of Variances	Average Square	Dk	Total of Square	T_{count}	T_{table}
Posttest	Between Group	74,609	1	24130,5	2,02	1,68
	In Group		40			
	Total	66,529	41	99234,4		

Source: Data on Hypothesis Results of Posttest Learning Outcomes

Based on table 8 above, the hypothesis experiment results for the final test (post-test) achievement in the experimental or control class were found to be $T_{count} = 2.02 > T_{table} = 1.68$, so H_0 was rejected, and H_1 was accepted. In other words, differences were found in the average scores in the experimental and control classes, which means that students' achievement in learning using the pair checks model is significantly high compared to student achievement in learning using conventional methods.

3. The critical thinking ability of students taught using the cooperative model of the Pair Checks type is higher than the critical thinking ability of students taught using conventional learning.

The third hypothesis states that the finding of students' thinking ability taught in the Pair Checks model is higher than the students' critical thinking ability taught conventionally. The analysis was carried out through a t-test calculation, so the results of data analysis in the experiment in Chart 9 are:

Table 9. Results of post-test students' critical thinking ability in experimental and control classes

No	Statistics	Critical Thinking Ability	
		Experiment Class	Control Class
		<i>Posttest</i>	<i>Posttest</i>
1	N	23	17
2	Xmax	94	87
3	Xmin	51	44
4	$\bar{x}$	76,26	69,06
5	S	13,75	14,88

Table 10. Hypothesis Results of Critical Thinking Ability of Post-test Experiment and Control Class

Critical Thinking Ability	Number of Variances	Average Square	Dk	Total of Squares	T_{count}	T_{table}
<i>Posttest</i>	Between Group	76,261	1	35762,9	1,78	1,68
	In Group		40			
		69,059		48977,6		
	Total		41			

Source: Hypothesis Results Data of Posttest Critical Thinking Ability

From the table above, the average analysis results obtained from critical thinking ability in integrated thematic learning based on low prior knowledge at a level of 0.05 resulted in T arithmetic > T chart $0.178 > 1.68$, so H_0 was rejected H_1 was accepted. In other words, it was found that the differences in the thinking ability of students who were taught based on the Pair Checks model were higher than their critical thinking ability.

After the post-test test of critical thinking ability was carried out in the experimental and control classes, these values were then tested using an independent comparison T-test to see the difference between the scores of the two classes. The results are as follows:

Table 11. Independent Comparative test results of sample T-test

Statistics Group						
		CLASS	N	Mean	Std. Deviation	Std. Error Mean
Score of Critical Thinking Ability	Pair Checks Model		23	76.26	13.752	2.867
	Conventional Model		17	69.06	14.876	3.608

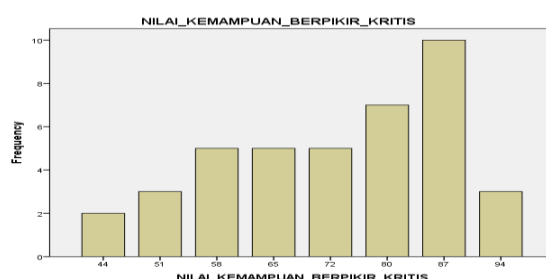
Based on table 11 above, the average score from the results of independent comparative analysis obtained based on the critical thinking ability in integrated thematic learning from the two classes is 76.26 in the experiment class, which is higher than the average score of the control class 69.06. The

0.05 level is obtained so that H_0 is rejected and H_1 is accepted. In other words, the finding of a significant difference is that students' critical thinking ability taught by the Pair Checks model is higher than thinking ability using conventional learning.

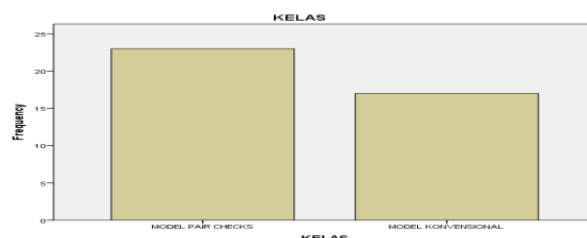
The results of the third hypothesis indicate that students' critical thinking ability based on low prior knowledge whose learning uses the pair checks model is much different from conventional learning because the experiment class is controlled. Based on the independent comparative analysis test results, the average score obtained from the critical thinking ability of integrated thematic learning from the two classes was 76.26 for the average score of the experimental class, which was higher than the average score of the control class, 69.06. It is obtained at the 0.05 level of significance so that H_0 is rejected and H_1 is accepted. In other words, there is a significant difference between the critical thinking ability of students who are taught with the cooperative model of the Pair Checks type, which is higher than the critical thinking ability of conventional learning. This is in accordance with Ahmad Farisi, Abdul Hamid (2017), critical thinking is thinking well by reflect on the thinking process that is part of thinking well. Critical thinking is used in mental activities such as solving problems, making decisions, analyzing assumptions, and conducting scientific research (Ahmad Farisi, Abdul Hamid, 2017). One of the tasks of educators in carrying out learning is to provide the right opportunities or opportunities to students so that the needs of students can be met. "This opportunity can be achieved if there is a critical interactive relationship between educators and students that provides direction for the growth of creativity, critical thinking and self-confidence" (Sutresna, 2015). Improving critical thinking ability today is an obligation because problems and challenges of life arise (Hasratuddin, 2010).

It can be seen the difference in the score of critical thinking abilities of students in the experimental class and the control class in the graph below:

Graph 4. 3 The Score of critical thinking ability



Graph 4. 4 Comparison of the average scores of the two sample classes



In the graph above, it can be seen that there is a significant difference between the critical thinking ability of students who are taught with the cooperative model of the Pair Checks type, which is higher than the critical thinking ability of conventional learning.

4. There is a relationship between learning outcomes and critical thinking ability with the cooperative model of Pair Checks type

The research shows that there is a link between learning outcomes and students' thinking ability in implementing the Pair Checks model. Through the calculation of a simple linear regression test, the learning achievement in the experimental and control classes is obtained as shown in Figure 12 below:

Table 12. Simple linear regression test on the cooperative model of Pair Checks

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	T
		B	Std. Error	Beta	
1	(Constant)	-.768	6.420		-.120
	LEARNING RESULTS	1.032	.085	.936	12.157
					.906
					.000

a. Dependent Variable: CRITICAL THINKING ABILITY

Source: From the results of research data at UPT. SDN 08 Mandeh

From table 12, from testing the fourth hypothesis by using a simple regression test formula or effective contribution whose calculations use SPSS 24, it is obtained that the value of score = $0.00 > 0.05$ from the analysis of the average score of critical thinking ability in the experimental and control class based on learning outcomes on the calculation of the fourth hypothesis. So H_0 is rejected, and H_1 is accepted. Therefore, the Pair Checks model is influenced by students' critical thinking ability in shaping student learning outcomes. The conclusion of the fourth hypothesis is that there is a significant relationship between learning outcomes and critical thinking ability on the cooperative model of the Pair Checks type, and the analysis of the average achievement of critical thinking ability in the experiment and control class based on learning outcomes in the fourth hypothesis calculation obtained the value = $0.00 > 0.05$, so H_0 is rejected, and H_1 is accepted. Furthermore, it was found that there was an impact or relationship between lesson achievement and students' thinking ability on the pair checks lesson model. Therefore, the fourth hypothesis concludes a striking relationship between the Pair Checks model and its critical thinking model, as depicted in Chart 13.

Table 13. Effective contribution of post-test critical thinking skills and learning outcomes

Model Summary										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig.	F Change
1	.936 ^a	.876	.870	4.965	.876	147.790	1	21	.000	

a. Predictors: (Constant), LEARNING RESULT

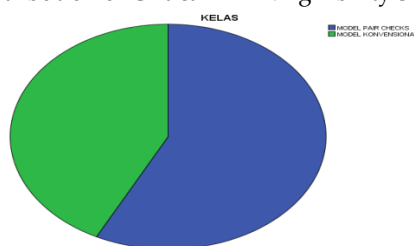
From table 13 above, the effective contribution between learning achievement and thinking ability is 87.6%, and other factors influence the remaining is 12.4. From the results of statistical tests,

we can conclude that there is an influence between learning outcomes and thinking ability on the pair checks learning model, which contributes 87.6% effectively, and there is learning acquisition and thinking ability on the pair checks learning model. It can also be seen from the graph below:

Graph 14. Critical Thinking Ability Score from post-test scores



Graph 15. Effective Contribution of Critical Thinking Ability Scores from post-test scores



From graphs 14 and 15 above, the effective contribution between learning outcomes and critical thinking ability is 87.6%, and other factors influence the remaining 12.4. From the results of statistical tests, we can conclude that there is an influence between learning outcomes and critical thinking ability on the cooperative learning model of the pair checks type, which contributes 87.6% effectively, and there are learning outcomes and critical thinking ability on the cooperative learning model of the pair checks type.

The part that supports the statement above is that the experimental class based on students' critical thinking ability with the Pair Checks model showed a higher average score of critical thinking ability than the control class students, whose critical thinking ability was recorded low because the learning method used conventional learning. In the experimental class, high and low initial knowledge is given as an opportunity to read sources of information or express knowledge about the material being studied to other students. In starting the learning process, each student can improve their critical thinking ability from the information and conduct discussions on predetermined topics.

The discussion in the section above concludes a significant interaction between the cooperative model of Pair Checks type on students' critical thinking ability toward integrated thematic learning.

From the research findings, it can be concluded that there is an effect of the cooperative learning model of the pair checks type on the integrated thematic learning outcomes seen from the critical thinking ability of fourth-grade elementary school students.

4. CONCLUSION

After applying the pair checks model in class IV as the experimental class and the conventional model in the control class at SDN 08 Mandeh, the results of hypothesis testing for critical thinking ability and learning outcomes of the final test (post-test) using the pair checks model were obtained in the experimental class. Furthermore, the control class is $T_{\text{count}} = 1.78 > T_{\text{table}} = 1.68$ and $T_{\text{count}} = 2.02 > T_{\text{table}} = 1.68$, so H_0 is rejected, and H_1 is accepted, which means that there are differences in the experimental and control classes. The ability to think critically and Student learning outcomes using the pair checks model was significantly higher than the students' thinking ability using the conventional model, and it can be concluded that there is an effect of the pair checks model on learning outcomes and critical thinking ability for grade IV elementary school.

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