



Improving Students' Creative Thinking Skills by Combining Cooperative Script and Reciprocal Teaching Models

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Abstract: This study aims to describe the increase in students' creative thinking by combining cooperative script learning models with reciprocal teaching. This research is a Class Action Research (CAR). This research was conducted in class XI SMA. Learning tools, essay questions combined with creative thinking, observation sheets of learning implementation, and creative thinking instruments were used to collect data. Data analysis on the increase in creative thinking was calculated using the score gain (N-Gain) formula. The results show an increase in students' creative thinking, namely from cycle I with a score of 0.28 which is included in the low category, rising to a score of 0.5 in cycle II which is included in the medium category. The results of this study indicate an increase in students' learning activities and creative thinking in each learning cycle. Combining cooperative and reciprocal learning models can encourage students to dare to express opinions, thoughts, and ideas to empower students' creative thinking skills. This shows that applying the cooperative learning model, a combination of collaborative learning models with a reciprocal teaching model used continuously, can increase students' learning activities and creative thinking to train them to become self-regulation learners.

Keywords: cooperative script, reciprocal teaching, cooperative learning, creative thinking

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INTRODUCTION

The learning process has now shifted from teacher-centered learning to student-centered learning. Student-centered learning is a learning process that pays attention to empowering students' thinking abilities. Huang et al. (2022) and Komatsu et al. (2021) explain that Student-Centered Learning (SCL) is a continuous learning process. Further, Gaeta et al. (2021) state that the SCL learning process can encourage students to become self-regulated learners (SRL). In line with this, Miao and Ma (2022) explain that students who have become SRL will become students who are active in participating in the learning process. Moreover, Klimova et al. (2022) and Vosgerau and Elias (2022) explain that SRL is a learner who has good metacognitive. Similar to that, Huang et al. (2022), Levesque-Bristol et al. (2020), and Sharma (2021) explain that SCL has an impact on improving higher-order thinking skills (HOTS). Horváthová and Nad'ová (2021) and Zain et al. (2022) explain that HOT includes the ability to communication, collaboration, critical thinking, and creativity.

Creative Thinking is an essential ability to be improved in the learning process. Santos et al. (2021) explain creative thinking as a life skill in solving various problems. Redifer et al. (2021) explain that creative thinking is the ability to generate new ideas or ideas that differ from others. Jawad et al. (2021) explain that creative thinking is a skill in evaluating information, generating ideas, and making solutions. Jawad et al. (2021), Mason (2021), and Treffinger (2002) describe several indicators of creative thinking, which include 1) fluency, 2) flexibility, 3) originality, 4) elaboration, and 5) symbolic thinking. Furthermore, Yang et al. (2020) state that creative thinking can encourage achievement, mathematical thinking, and students' conceptual understanding.

However, the application of student-centered learning has not run optimally. This can be seen from the results of observations at Arjasa Jember High School, especially in class XI IPA in Biology subject which shows that teachers do not apply learning models, teachers are often the primary source of information, students are rarely given learning instructions in finding, obtaining and using this information effectively. In line with this, Purnomo et al. (2020), Purwati et al. (2018), and Sumardi et al. (2020) report that the learning process in high school is still dominated by conventional learning. Bdair (2021) explains that the teacher's ability to apply learning models is still low, so the learning process uses conventional learning. Deeva et al. (2021) explains that teachers rarely provide feedback regarding the material being studied. Pérez et al. (2021) reports that the current learning process is ineffective.

The results of observations also show that the learning process's primary goal is only students' ability to understand learning concepts and theories. Teachers do not empower students' creative thinking so that students' creative thinking skills in the learning process do not get attention. This is in line with Listiana and

Bahri (2019), which state that the biology learning process has not empowered students' creative thinking skills. Furthermore, Walker and Koralesky (2021) report that in the learning process, students are not actively involved; students tend to listen to lectures and read the subject matter. Baticulon (2021) reports that students have difficulty following the learning process and poor communication between teachers and students. Zainil et al. (2022) state that inappropriate learning could cause students' creative thinking skills to be low.

Based on the importance of creative thinking in the learning process, it is necessary to empower students' creative thinking. Students' creative thinking can be empowered by using learning models. Jawad et al. (2021), Shahin et al. (2021), and Wannapiroon and Pimdee (2022) report that the Science, Technology, Engineering, and Mathematics (STEM) approach can develop students' creative thinking. Hursen (2020) and Srikan et al. (2021) report that the problem-based learning model effectively develops students' critical thinking skills. Chen et al. (2019) report that project-based learning can encourage students' creative thinking, especially regarding fluency and flexibility. Listiana and Bahri (2019) report that students' creative thinking skills can be empowered with learning models such as Group Investigation (GI), Think Talk Write (TTW), and Group Investigation combined with Think Talk Write (GITTW). Many studies report that learning models can empower students' creative thinking. However, it is still rare to find research reports on improving students' creative thinking by implementing cooperative scripts combined with the reciprocal teaching model. Therefore, this research is fundamental to do. Furthermore, you can learn how to increase student learning activities in the cooperative script model with reciprocal teaching and how to increase students' creative thinking by applying the cooperative script model combined with reciprocal teaching.

METHODS

This research was a type of Classroom Action Research (CAR) that was carried out in high schools. The research design used the theory proposed by Carr and Kemmis (1983). The research steps consisted of 1) planning by making learning tools and validating the devices, 2) action by applying a combination of cooperative script and reciprocal teaching models, 3) observation by making observations related to the implementation of the learning process, and 4) reflection by assessing the learning process that had been carried out and the achievement of student's creative thinking. The implementation of this research was carried out in two cycles, where each cycle consisted of two lessons. Furthermore, the combined syntax of the cooperative script and the reciprocal teaching model consists of seven learning syntaxes can be seen in Table 1.

Table 1. Cooperative Script Learning Model Combined with Reciprocal Teaching

Syntax	Teacher Activities	Student Activities
Stage 1 Giving the task of reading discourse/reading material (done at home before learning)	Students must read the discourse/material according to the topic to be studied at the next meeting. Each should be to make students understand the main ideas and essential concepts of the material that has been read.	Read the discourse/material according to the topics to be studied at the next meeting and conclude the main ideas and essential concepts from the material that has been read.
Stage 2 Division of Pairs Groups	Organizing students to form pair groups by determining who will be the speaker (student A) and listener (student B).	In pairs in groups as speakers (student A) and listeners (student B).
Stage 3 Discussion in pairs	Listener (student B) Give the opportunity to student A to read earlier according to the summary made to student B and student B is tasked with detecting/correcting student A's summary errors by: helps point out incomplete ideas. remember main ideas by connecting previous material. Provide opportunities for both partners to exchange roles and take turns doing the same activities.	Student A explains the results of previous reading activities according to the summary made to Student B and Student B is tasked with detecting/correcting errors in Student A's summary by: helps to show incomplete ideas. remember the main idea by connecting the previous material. Both partners switch roles and take turns doing the same activity.
Stage 4 Create Questions	Ask each student to make 2 questions based on the discourse/material that has been read.	Make two questions based on the discourse/material that has been read.
Stage 5	Each student's answer predicts the	Make predictions of these answers in a

Syntax	Teacher Activities	Student Activities
Predicting Answers	answer to the question in a closed book. Students have difficulty exchanging questions that have been made with their partners.	closed book and exchange questions that have been made with their partners.
Stage 6 Clarifying Answers	Ask each pair to discuss to clarify the results of predicting answers in an open book.	Conducting pair discussions to clarify the results of predicting answers in an open book.
Stage 7 Summarize	Providing opportunities for each pair to work together to develop analogies or descriptions of the information obtained, both obtained based on the results of discussions and answers to questions clearly and precisely in summary form.	Work together to develop analogies or descriptions of the information obtained based on the results of discussions and answers to questions clearly and precisely in summary form.

The instrument used in this research tested students' creative thinking skills. Students' creative thinking scores were analyzed by calculating the average score using N-Gain. The N-gain score test was carried out by calculating the difference between the pretest value (test before the treatment was applied) and the posttest value (test after the treatment was applied) divided by the ideal value and reduced by the pretest value. The N-Gain calculation results were then put into three categories, as shown in Table 2.

Table 2. Interpretation of creative thinking (gain score)

Score interval	Interpretation
> 0.7	High
$0.7 \geq X \geq 0.3$	Medium
< 0.3	Low

RESULT AND DISCUSSION

Pre-Cycle

The pre-cycle results show that the learning process activities are still teacher-centered. The learning process begins with completing material and discussion and ends with doing assignments. The teacher does not apply a learning model, so there are no learning steps in the learning process that encourage students to be active in finding, obtaining, and using material concepts independently. Furthermore, student learning outcomes are still low with the minimum completeness criterion (KKM), namely 80. The low student learning outcomes are known from 30 students whose average score is 63 with the number of students who did not complete, namely 19 students and 11 students who completed. The N-Gain calculation results are then put into three categories, as shown in Table 2.

Cycle I

Cycle I consists of three steps: planning, implementation, observation, and reflection. Planning steps include 1) the development of appropriate lesson plans, a combination of cooperative script and reciprocal teaching models, 2) cognitive test questions integrated with students' creative thinking skills, and 3) observation sheets of learning implementation. The implementation step is to apply learning devices in class. The observation step is to make observations related to implementing the learning process. The reflection step is to evaluate the learning process that has been implemented and the achievement of the student's creative thinking. The reflection results are 1) inappropriate use of time, 2) many students have difficulty detecting and correcting completion errors and asking questions, 3) teachers and students still need to adapt to a combination of cooperative scripts and reciprocal teaching models, 2) students' active participation in the learning process is still increasing, 3) students' creative thinking skills need to be empowered. Further, students' creative thinking skills can be explained in Table 3.

Table 3. Achievement of students' creative thinking in Cycle I

Value Description		Enhancement (%)	N-Gain	Category
Average Pretest	Average Posttest			
55	68	19	0,28	Low

Based on Table 3, it is known that the increase in students' creative thinking skills is 19% with an N-Gain value of 0.28, which means it is still in the low category. Referring to this, it was decided that the research

was continued to cycle II.

Cycle II

Cycle II is a continuation of the learning process from the results of Cycle I. Cycle II is a refinement of the learning process activities from Cycle I. The steps in Cycle II are the same as in Cycle I. The planner is developing a learning activity plan complemented by learning improvement objectives, cognitive test questions, integrated skills of creative thinking, and observation sheets of learning implementation. The next step is the application or application of the learning tools that have been planned. The observation step is to make observations related to the learning process. The last is to reflect, namely to evaluate the learning process that has been implemented and the achievement of students' creative thinking. The reflection results are: 1) students are active in the learning process, 2) students are used to detecting and correcting completion errors, 3) students are used to making questions based on the material, and 3) students' creative thinking skills are good. Further, students' creative thinking skills can be explained in [Table 4](#).

Table 4. Achievement of students' creative thinking in Cycle II

Value Description		Enhancement (%)	N-Gain	Category
Average Pretest	Average Posttest			
60	80	25	0,5	Medium

Based on [Table 4](#), it is known that students' creative thinking skills increased by 25% with an N-Gain value of 0.5, which means they are in the medium category. Referring to this, it was decided that the research objectives had been achieved. Based on the analysis results, combining a cooperative script and reciprocal teaching models can improve students' creative thinking from the low category to the medium type. Increasing students' creative thinking cannot be separated from the steps that students must take during the learning process, such as Reading the material before the learning process. Reading like that will give students an initial understanding of the essential concepts of the material so that students have important concepts and ideas related to the material before the learning process in class. This makes it easier for students to construct their knowledge with other students and teachers in following the learning process in class. This can be seen from students who can read well, they will be more active in providing ideas that are more systematic and by what they have read, and reading can encourage student learning activities. In line with this, [Jian \(2022\)](#) states that reading is students' initial knowledge that will be used to understand subsequent knowledge. [Reichardt et al. \(2023\)](#) argue that reading can improve students' memory and increase curiosity, mainly if reading-related questions support it. Furthermore, [McCarthy et al. \(2023\)](#) state that reading will provide a difference in the quality of initial knowledge and will affect effectiveness in learning.

Paired discussion activities train students to explain the summaries made to their partners correctly and systematically. Furthermore, their partners will also practice detecting or correcting errors in the summary that has been presented. This pair discussion activity will train students' short-term memory to see inaccurate, incomplete concepts. [Yee et al. \(2018\)](#) report that pair discussion activities can train learning abilities simultaneously, further improving problem-solving skills. [Wunnasari et al. \(2018\)](#) present that pair discussions can teach students to explain their understanding in detail, and joint activities can encourage more effective conversations, enabling partners to understand each other.

The activity of making questions trains students to be able to assess the thinking skills they already have and to analyze the quality of the questions and answers they have made. The better the quality of questions and answers created by students, the better their thinking skills are good. [Grainger et al. \(2018\)](#) argue that making questions can train students to evaluate concepts they have learned and practice synthesizing information from various sources, thus encouraging student learning abilities. [Kurtz et al. \(2020\)](#) show that making questions benefits students because in making questions, students must first be able to integrate concepts they have before while also comparing ideas. [Paramasivam and Nirmala \(2023\)](#) demonstrate that making questions is one way to assess students' understanding because students must be able to find relevant information about the questions that are asked; it also develops students' ability to argue.

Summarizing is a higher-order thinking skill requiring metacognitive strategies to write well. Furthermore, making summaries can train students to describe and track the effects of knowledge from the results of the learning process. Making summaries can monitor and guide the learning process because when students make summaries, it requires attention and focuses from thinking skills and evaluating understanding of the topics that have been written. [Kim and McCarthy \(2021\)](#) state that writing summaries is a valuable instructional tool for learning to assist students in describing concepts and relationships from ideas they already have. [Chauhan et al. \(2022\)](#) state that making summaries is a way of learning to increase student retention. [Krishnaveni and Balasundaram \(2021\)](#) state that summarizing can help students understand the material quickly. Based on the results of the analysis of the application of cooperative and reciprocal combined learning models

can increase student activity. Students become active in the learning process because they follow learning instructions so that they are encouraged to seek, acquire and use knowledge independently. Benjamaha and Uantrai (2021), Chaiyama (2018), and Suharyati et al. (2020) state that asking questions, seeking and conveying information, studying problems, and having discussions make students active in the learning process. Furthermore, Pifarré and Li, (2018) state that pair discussions can encourage more effective learning because they can train students to understand each other and collaborate. Rosales et al. (2018) argue that collaborative activities are one of the skills of the future. Dilekçi and Karatay (2023) also present that one of the skills of the future is the ability to work together and think creatively. The same thing is conveyed by Asrizal et al. (2022) and Suherman et al. (2021) that creative thinking can increase the formation and discovery of ideas in the learning process and as a skill at the age of 21 years. The combined syntax of cooperative and reciprocal learning models can encourage students to practice searching for, obtaining, and using learning information systematically and independently. Peters-Burton (2018) and Zarouk et al. (2020) state that the syntax of the learning model can encourage students to be active in the learning process so that it trains students to become independent learners. Fomina et al. (2022) state that independent learners encourage student success in learning.

CONCLUSION

Applying the combined cooperative script learning and reciprocal teaching models can improve students' creative thinking from low to moderate categories for two cycles. The combined learning model between the cooperative script and the reciprocal teaching model can encourage student learning activities to seek, obtain and use information during the learning process. Increased student learning activities impact increasing creative thinking so that students are trained to become independent learners. Therefore, teachers are expected to be able to apply script cooperative learning models combined with reciprocal teaching to enhance students' creative thinking. In addition, teachers can also apply cooperative learning models carried out on an ongoing basis to improve students' thinking skills.

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