

THE IMPLEMENTATION OF RADEC MODEL ASSISTED BY CROSSWORD PUZZLE TO IMPROVE STUDENTS' CRITICAL AND CREATIVE THINKING

RESEARCH ARTICLE

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Abstract

Critical and creative thinking abilities of 8th-grade students in MTs Ahmad Yani Jabung Malang are still low. This can be seen when students have difficulties in expressing opinions and finding a correlation between materials and problems in the student environment. Students are also not creative in making alternative answers to problems because most students answer by copying answers from the 8th-grade civic education book. This study aims to determine the implementation of the RADEC learning model assisted by Crossword Puzzles to improve students' critical and creative thinking abilities. This study used a qualitative approach. The type of study used was classroom action research, which was conducted in two cycles. Each cycle consisted of three stages: (1) planning, (2) action or observation, and (3) reflection. The subjects of the study were 26 students in class 8A of MTs Ahmad Yani Jabung. Data analysis included the analysis of learning implementation, critical, and creative thinking. The results of the study showed: 1) the implementation of the RADEC learning model assisted by crossword puzzle showed that there is an improvement in critical thinking ability school of class 8A students in MTs Ahmad Yani Jabung Malang with score gain includes in moderate category, and 2) the implementation of RADEC learning model assisted by Crossword Puzzle showed that there is an improve in creative thinking ability school of class 8A students in MTs Ahmad Yani Jabung Malang with score gain includes in moderate category.

Keywords: creative, critical, crossword, puzzle, RADEC

Introduction

In the 21st century, students are required to have the ability to keep up with the times. 21st-century abilities intended are 4C (Creative Critical Thinking, Critical Thinking, Collaboration, and Communication), which are considered important in the current era. Abilities that must be owned by students to face the challenges are critical and creative thinking abilities. According to (Greenstein, 2012), critical thinking ability is the basis for other skills because it is correlated with

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individual ability in developing a mindset. Creative thinking is related to new things, the ability to create something, to apply new forms, and to create many imaginative abilities to make something that already exists to be something new (Greenstein, 2012). This theory is in line with the research results Destrinelli et al (2020) the demands of being students who must be able to think critically and creatively in order to be competitive are due to intense competition in this era. Apart from that, according to research Sumarni and Kadarwati (2020) critical and creative thinking abilities are important things in solving problems faced by students during the learning process. The implementation of critical and creative thinking abilities in civic education allows students to develop different habits of critical and creative thinking in every problem-solving process. This is in accordance with one of the objectives of civic education subject, which is to give students critical, rational, and creative thinking abilities in responding to citizenship issues (Dinata et al., 2021).

Before conducting research at MTs Ahmad Yani Jabung, researchers conducted a preliminary study. During the preliminary study the researcher made observations. This observation was carried out during civic education teaching and learning activities in August 2023. Based on the results of observations that have been made, it was found that the learning process is still dominated by the teacher, causing less student activity. The teacher tends to use the lecture method in delivering materials, and the learning process is still textual, referring to the 8th-grade civic education book. Learning objectives are limited to knowing and understanding, and critical and creative thinking habits have not yet been developed. Therefore, the teacher does not assist in developing students' critical and creative thinking abilities.

Apart from making observations, the researcher also conducted an interview with Mr. Aspali, S.Pd, a civic education teacher in 8th grade. Based on the results of the interview, it was found that the critical and creative thinking abilities of class 8A are still low. This can be seen when students have difficulties in expressing opinions and finding a correlation between materials and problems in the student environment. Students are also not creative in making alternative answers to problems because most students answer by copying answers from the 8th-grade civic education book. This is strengthened by the pre-action test conducted. This is shown by the initial test of critical thinking ability, which showed an average score of 43%. Students are still unable to apply, evaluate, or use data to develop critical insight, analyze, and synthesize. Meanwhile, the test result of creative thinking abilities showed an average score of 48%. Students are still not able to show curiosity, fluency, flexibility, originality, and elaboration. Furthermore, when the teacher gives an explanation about the material, students tend to note down everything delivered by the teacher, especially when asked to summarize the material. Students tend to write long notes and are not able to take the essence of the material presented to be a simple note that can cover all the material. Students also are not able to change ideas from long sentences into main ideas. This shows that students are not able to think creatively when creating creativity in writing.

Based on the results of the preliminary study, in order to improve students' critical and creative thinking abilities, the right solution must be provided, one of which is by implementing the RADEC learning model assisted by a Crossword Puzzle. RADEC learning model is an alternative learning model that suits educational requirements in Indonesia. This model has several stages: reading, answering, discussing, explaining, and creating. Based on articles written Putra and Setiawan (2019), this model is a new concept in education that expects 21st-century achievements because it can improve students' abilities to think critically and creatively. According to several previous

studies, the RADEC learning model in this study is able to improve critical and creative thinking abilities in students that are required in 21st-century life. This is in line with a study conducted by (Nurnaningsih et al., 2023), which showed that the RADEC learning model can train students' critical and creative thinking abilities. Based on a study by Rifatunnisa et al. (2023), the learning process using the RADEC learning model can improve critical thinking ability in civics subjects. This is shown by the increasing results of the evaluation test, where there is an increase of 37% in cycle I and 63% in cycle II. A study conducted by Yulianti et al. (2022) stated that the implementation of the RADEC learning model in civic education subjects can improve critical thinking ability, as shown by the increase in students' learning outcomes, which increase significantly.

Students' critical and creative thinking abilities will improve only by implementing a learning model. Learning media also must be used by teachers to assist students in learning. The crossword puzzle learning media is one of the learning tools that can assist students in thinking more critically and creatively. According to (Johnson & Roessingh, 2004), crossword puzzles can be used to learn mindset, logical thinking, approach systems, and general problem-solving skills. According to the results of research conducted by Pujiati et al. (2016), Crossword Puzzle learning material can improve students' creative thinking ability during the learning process. Based on (Yunitasari et al., 2019), students' creative thinking ability improved after implementing Crossword Puzzle learning media. Thus, implementing the RADEC learning model assisted by crossword puzzles is expected to stimulate students to think critically and creatively in the learning process. According to the problems explained, the researcher wants to conduct research with the following problem formulation: 1) what are the results of implementing the RADEC learning model assisted by crossword puzzle media to improve students' critical thinking skills in the civic education subject at MTs Ahmad Yani Jabung Malang? 2) what are the results of implementing the RADEC learning model assisted by crossword puzzle media to improve students' creative thinking abilities in the civic education subject at MTs Ahmad Yani Jabung Malang?

Literature Review

In the 21st century, students are required to have the ability to keep up with the times. 21st-century abilities intended are 4C (Creative Critical Thinking, Critical Thinking, Collaboration, and Communication), which are considered important in the current era. Abilities that must be owned by students to face the challenges are critical and creative thinking abilities. The implementation of critical and creative thinking abilities in civic education allows students to develop different habits of critical and creative thinking in every problem-solving process. This is in accordance with one of the objectives of civic education subject, which is to give students critical, rational, and creative thinking abilities in responding to citizenship issues (Dinata et al., 2021). In order to improve students' critical and creative thinking abilities, the right solution must be provided, one of which is by implementing the RADEC learning model assisted by a Crossword Puzzle.

The Read, Answer, Discuss, Explain, and Create (RADEC) learning model is one of the learning models that is suitable for implementation in learning conditions in Indonesia. RADEC learning model is a learning model that requires students to develop their critical thinking abilities and aims to improve students' abilities to be human beings who believe in God, have noble morals,

healthy, knowledgeable, capable, creative, independent, and being democratic and responsible citizens. RADEC learning model focuses on mastering 21st-century competencies and skills. RADEC learning model has characteristics in learning, including (1) RADEC learning always encourages students to be actively involved in the learning process; (2) RADEC learning encourages students to study independently; (3) RADEC learning always connects what students know with the materials studied; (4) RADEC learning connects material studied with real life or contemporary issues; (5) RADEC learning always provides opportunity for students to actively ask questions, discuss, propose investigation plan, and conclude materials studies; (6) RADEC learning provides opportunity for students to study materials deeply through pre-learning assignments (Sopandi W et al., 2021).

Students' critical and creative thinking abilities will improve only by implementing a learning model. Learning media also must be used by teachers to assist students in learning. The learning media of crossword puzzles is one of the learning tools that can assist students in thinking more critically and creatively. Crossword puzzles are a fun learning media game that can be applied to learning activities. According to Johnson and Roessingh (2004), crossword puzzles are games that can be used to learn mindset, logical thinking, approach systems, and general problem-solving skills. Even though a crossword puzzle is just a collection of puzzles, it encourages logical thinking and problem-solving skills that also can educate, provide insight, and improve quick thinking. Therefore, the use of crossword puzzles as a learning medium can assist students in developing their thinking abilities and memory, especially in knowledge.

Methodology

Research design and approach of the study

This study used a qualitative approach. This is because the data explained are factual data that actually occurred during the study. Data obtained were then reported in writing or statements, not simply in the form of numbers. The type of study used was Classroom Action Research. Classroom Action Research was chosen because the problems solved come from the teaching and learning process. Classroom Action Research used in this study was Kemmis and McTaggart (2014) models. According to Kemmis and McTaggart (2014), the main concept of action research consists of three components: (1) planning, (2) action or observation, and (3) reflection.

Research site and participants

The subjects of the study were 26 students in class 8A of MTs Ahmad Yani Jabung. The subjects of the study were obtained according to the results of the discussion and referrals from the civic education teachers at the school. The object of the study in this classroom action research was the improvement of critical and creative thinking in civics subject in the material on the Sequence of Legislative Regulations in National Legal System in Indonesia in class 8A of MTS Ahmad Yani Jabung through RADEC learning model assisted by crossword puzzle media.

Data collection and analysis

This study used a classroom action research method designed in two cycles. Each cycle consists of three components: (1) planning, (2) action or observation, and (3) reflection. If the results of cycle I are not in accordance with the expected research objectives, cycle II improvement will be conducted. This study was conducted in two cycles. The instruments used were: 1) a syllabus is a set of plans and implementation of learning arrangements created for a system that contains all components that are related to the aim of mastering basic competencies, 2) lesson plan is short-term planning to estimate or project things that will be done in learning, 3) student worksheet are sheets containing assignments that must be done by students, 4) evaluation sheet is a tool that is given to students in the form of questions, and 5) learning implementation sheet is used to determine the practicality of the lesson plan in terms of the level of learning implementation. This research instrument was validated by expert validation. Data collection techniques were observation, interview, and test: 1) observation on activities carried out by civics teacher. This observation was only carried out during the teaching and learning process. This was to determine students' activities in the learning process and record the results in the observation sheet; 2) the interview is collecting information through direct question and answer activities with the civics teacher in class. This activity aims to obtain initial information about the learning process in class. Moreover, the researcher also conducted interviews with several students to obtain information about the civic education learning process in class; (3) tests provided in the form of essays in each cycle to determine the development of students' critical and creative thinking abilities. Data analysis included the analysis of learning implementation, critical thinking abilities, and creative thinking abilities.

Results

Analysis of learning implementation

Cycle I was carried out over 3 meetings from October 24, 2023, to November 7, 2023. Meetings I and II were learning activities using the RADEC model assisted by crossword puzzle media. Meeting III was a test of critical and creative thinking abilities. In cycle I, the material taught was the Sequence of Legislative Regulations in the National Legal System in Indonesia. The implementation of cycle I was conducted with the following steps: 1) Acton Planning Stage of Cycle I: the researcher arranged everything required for carrying out action/observation. The procedures carried out were: a) carrying out analysis of competency standards and basic competencies that will be delivered to students, b) developing Lesson Plan, c) compiling teaching materials, d) compiling Student Worksheets that refer to RADEC learning model and material assisted by crossword puzzle media, e) preparing worksheets containing pre-learning questions that are suitable to the material to be taught, f) compiling evaluation sheet in the form of test to determine critical and creative thinking abilities, and g) compiling learning implementation sheets by teacher and student. 2) Action/Observation Stage a. Cycle I Meeting I was carried out on October 24, 2023, in class 8A with a time allocation of 3 x 40 minutes from 10.40 to 12.40 WIB. In cycle I meeting 1, the teacher used the RADEC model assisted by crossword puzzle media. 3) Reflection was carried out to determine whether the implementation of the RADEC learning model assisted by crossword puzzle

media in cycle I can improve students' critical and creative thinking abilities. The reflection results were obtained from direct observation during the learning process. The results of reflection were used as the basis for learning planning in cycle II if, in cycle I, there were deficiencies and weaknesses. The results of reflection in cycle I were: a) in the group formation stage, students prefer to make their own group; b) in discuss stage, students are not able to do assignments independently, so they seem to be dependent on other group members; c) in explain stage in front of the class, pointing at each other to deliver the results of group discussion could be seen because they were afraid if they said something wrong, other students will laugh at them d) students were less responsive in asking and answering questions during group discussion and class discussion; e) students have not able to explain answer from the results of discussion so they answered questions briefly, f) students have not able to formulate conclusion from the results of discussion.

As a follow-up to address weaknesses and deficiencies in cycle I, improvement plans in cycle II were: 1) changes in group members that students want so the work generated will be more maximal, 2) each student is given the same responsibilities, especially in discuss and explain stages so students are more independent and responsible, 3) students are given task of learning to write questions and alternative answers from discussion tasks that will be discussed by the group during presentation, 4) the teacher gives prizes (added score) so that students are motivated to ask, answer, and do assignments, 5) the teacher often controls students during presentation so students are more focused and involved in discussion.

Cycle II was carried out over 3 meetings from November 14, 2023, to November 28, 2023. Meetings I and II were learning activities using the RADEC model assisted by crossword puzzle media. Meeting III was a test of critical and creative thinking abilities. In cycle I, the material taught was the Sequence of Legislative Regulations in the National Legal System in Indonesia. The implementation of cycle II was conducted with the following steps: 1) Action Planning Stage of Cycle II: the researcher arranged everything required for carrying out action/observation. The procedures carried out were: a) carrying out analysis of competency standards and basic competencies that will be delivered to students, b) developing Lesson Plan, c) compiling teaching materials, d) compiling Student Worksheets that refer to RADEC learning model and material assisted by crossword puzzle media, e) preparing worksheets containing pre-learning questions that are suitable to the material to be taught, f) compiling evaluation sheet in the form of test to determine critical and creative thinking abilities, and g) compiling learning implementation sheets by teacher and student. 2) Action/Observation Stage a. Cycle II Meeting 1 was carried out on November 14, 2023, in class 8A with a time allocation of 3 x 40 minutes from 10.40 to 12.40 WIB. In cycle II meeting 1, the teacher used the RADEC model assisted by crossword puzzle media. 3) Reflection was conducted to determine whether the implementation of the RADEC learning model assisted by crossword puzzle in cycle II was able to improve student's critical and creative thinking abilities compared to cycle I. Reflection in cycle II was made according to teacher and observer experiences during the learning process. Generally, the learning process was carried out according to the Lesson Plan by implementing the RADEC learning model, which is assisted by crossword puzzle media. Students started to get used to using the RADEC learning model, which was assisted by crossword puzzles. The teacher's attention was more intense in monitoring students' work both individually and in groups, which was actively going around asking about difficulties faced by

students in learning. The teacher gives students the freedom to complete assignments. Moreover, the teacher tried hard to stimulate less active and shy students by asking questions or answering.

The results of reflection in cycle II were: 1) students were more attentive and responsible for their work, 2) the formation of groups independently by students can accelerate the work process, 3) students were more motivated and active in asking and answering questions during group discussion or class discussion, and there was the additional score for active students, and 4) students could formulate the conclusion from the results of discussion in their own sentence.

Data analysis of critical thinking

According to the results of the critical thinking ability test in cycle I, the data were then analyzed and compared to the results of the critical thinking ability test in cycle II. The percentage of the score of critical thinking indicator is presented in the following table:

Table 1. *The percentage comparison of the score of critical thinking ability indicator in cycle i and cycle ii*

Indicator	Cycle I	Cycle II
Implementing	52%	78%
Evaluating	63%	77%
Using data to develop critical insight	64%	88%
Analyzing	57%	79%
Concluding	61%	86%
Mean	59%	82%
Gain	0.5 (moderate)	

The increase in the critical thinking ability score of class 8A students showed that using the RADEC learning model assisted by crossword puzzle media can improve critical thinking ability with a moderate gain score.

Data analysis of creative thinking

Data analysis of creative thinking was conducted to measure students' creative thinking abilities. The test conducted was in the form of a written test with 5 essay questions consisting of curiosity, fluency, flexibility, originality, and elaborate aspects, which was stated in the questions consisting of tests of word beginnings, word order, similar properties, extraordinary use, and the consequences. According to the results of the creative thinking ability test obtained in cycle I, the data were then analyzed and compared to the results of the critical thinking ability test in cycle II, which are presented in the following table.

Table 2. *The percentage comparison of the score of creative thinking ability indicator in cycle I and cycle II*

Indicator	Cycle I	Cycle II
Word Beginning	59%	76%
Word Ordering	60%	76%
Similar Properties	66%	85%
Extraordinary Use	56%	77%
Consequences	51%	81%
Mean	58%	79%
Gain	0.4 (moderate)	

The increase in the creative thinking ability score of class 8A students showed that using the RADEC learning model assisted by crossword puzzle media can improve creative thinking ability with a moderate gain score.

Discussion

The implementation of RADEC learning model assisted by crossword puzzle to improve students' critical thinking abilities

The implementation of the RADEC learning model assisted by the Crossword Puzzle showed that there was an increase in the critical thinking ability score of class 8A students in MTs Ahmad Yani Jabung Malang with a moderate gain score. An increase in the critical thinking ability score of class 8A students is in line with the study by (Vitriasari et al., 2023), which stated that the learning process using the RADEC learning model could improve critical thinking ability in the civic education subject. RADEC model has five stages based on its name that consists of five letters; the 5 stages are Read, Answer, Discuss, Explain, and Create (Sopandi, W., Pratama, Y. A., & Handayani, 2019). RADEC syntax in the learning process is as follows Sopandi in (Nurseptiani & Maryani, 2019). First is the read stage; students read the references and other sources related to the materials that will be discussed in class before learning begins. Other sources include reading books or digital reading books that can support learning activities. In this stage, students are used to literacy activities at home. This makes students more ready to receive lessons because they already have initial knowledge. Furthermore, in the answer stage, pre-learning questions are given to students. In pre-learning, students will be asked questions before direct learning in class. In the answer stage, students are asked to answer questions given directly. Moreover, students are able to give a broader perspective during the learning process. In discuss stage, students learn in groups to discuss answers determined by students from pre-learning questions. In discuss stage, students collaborate with their group friends to solve and examine the problems presented. The next is the explanation stage; in this stage, students present a classical explanation regarding the answer discussed. A group representative can be chosen as a presenter. In this stage, the teacher ensures that students' explanations are accurate and can be understood by other students. Students are more confident in presenting their thoughts and giving different opinions. Students also accept any differences of opinion from other groups. The last stage is the create stage, where students develop original ideas

and implement them into action through the formulation of questions, investigation, problem-solving, or projects that can be developed. Students in this stage are able to give solutions and even create creative and critical ideas as answers to the problems given. After taking action, students have an increase in their critical thinking abilities. Referring to the results of reflection in cycle I, improvement and more mature planning were carried out in cycle II. According to the results of the learning implementation analysis, the implementation of the learning activity in cycle II went very smoothly. It can be clearly seen that the steps or stages carried out were clear and easy to understand. Students have adapted to the RADEC learning model shown by completing tasks properly and being motivated by positive reinforcement. Based on the results of the study, the implementation of the RADEC learning model assisted by crossword puzzle media can improve critical thinking abilities. The percentage of the score on the critical thinking ability test in cycle I experienced an increase in cycle II. Each indicator of students' critical thinking abilities experienced an increase. This study is in accordance with a study conducted by (Nurnaningsih et al., 2023), which showed that the RADEC learning model can train students' critical and creative thinking abilities. According to the study by Rifatunnisa et al. (2023), the learning process using the RADEC learning model can improve critical thinking abilities in the civic education subject. A study conducted by (Yulianti et al., 2022) stated that implementing the RADEC learning model in the civic education subject could improve critical thinking ability, as shown by the increase in students' learning outcomes, which increase significantly.

The implementation of radec learning model assisted by crossword puzzle media to improve students' creative thinking abilities

The problems given to students can also help them train their creative thinking abilities. With their knowledge, students will try to solve problems and seek solutions that encourage them to think creatively. Students are encouraged to express their opinions in group or class discussions. Creative thinking aspects consist of curiosity, thinking fluently in expressing new ideas (fluency), thinking originally or new ideas (originality), thinking in detail (elaboration), and giving various ideas from several perspectives (flexibility) (Greenstein, 2012). These five aspects were demonstrated in the RADEC learning model stages, assisted by crossword puzzle media, when students were encouraged to come up with their various creative ideas for solving problems. In cycle I, students were not yet fluent in implementing the five creative thinking aspects. However, in cycle II, students began to be fluent in expressing their creative ideas, and they were able to express alternative answers when solving problems. A test containing creative thinking indicators showed the ability to think creatively with moderate score gain. The implementation of the RADEC learning model assists students in developing their creative thinking abilities through learning steps, including reading, answering, discussing, explaining, and creating. The combination of crossword puzzles as media in the learning process adds elements of challenge and fun and creates a learning environment that stimulates the imagination and creativity of students. This is in accordance with (Abdullah, 2016), who stated that the implementation of the crossword puzzle method is a learning technique that has a play feel so that learning activities feel fun, but there is an interest in improving an overview towards creative thinking. These results show that the diversity of students' answers is a form of creative thinking. Creative thinking abilities that were trained during the discussion resulted in many answers.

Moreover, improvement in cycle II influences on improving creative thinking abilities. This can be seen when students are required to create creative ideas and give answers to problems given. Diverse ideas that are possible answers are a form of creative thinking. Munandar (2014) provides an understanding of creative thinking as the ability to find many possible answers to a problem by emphasizing quantity, accuracy of use, and diversity of answers according to the data or information obtained. According to Prasetyo and Mubarokah (2014), creative thinking focuses on many ways of solving a problem according to the information provided and generating new ideas about a problem. This is in line with the study by (Pujiati et al., 2016), which stated that Crossword Puzzle learning material can improve students' creative thinking ability during the learning process. Based on Yunitasari et al. (2019), students' creative thinking ability is improved after implementing Crossword Puzzle learning media.

The limitations in the research conducted by researchers are: 1) how to obtain data from research. Researchers must observe directly and carefully implementing the RADEC learning model assisted by crossword puzzle media to improve students' critical and creative thinking abilities. By observing directly, researchers who are assisted by observers must really work hard to obtain data and find out developments experienced by students during the implementation of the RADEC learning model assisted by crossword puzzle media. However, it is an advantage to research thoroughly directly in class, researchers can see directly the abilities students learn using the RADEC learning model assisted by crossword media, 2) this research was carried out before the final semester examination so that the research time was limited carried out in 2 stages, namely cycle 1 and cycle 2, and 3) this research only aims to improve students' critical and creative thinking abilities in civics learning in class 8 A MTs Ahmad Yani Jabung with using the RADEC learning model assisted by crossword puzzle media. The limitations that researchers face above are of course more or less influence the research that researchers carry out. However thus, researchers have to face many obstacles and challenges grateful that this research has been successful smoothly.

Conclusion

Based on the results and discussion of the study, it can be concluded as follows: 1) The implementation of the RADEC learning model assisted by the Crossword Puzzle showed that there was an increase in critical thinking ability scores of class 8A students in MTs Ahmad Yani Jabung Malang with moderate gain score. 2) The implementation of the RADEC learning model assisted by the Crossword Puzzle showed that there was an increase in the creative thinking ability score of class 8A students in MTs Ahmad Yani Jabung Malang with a moderate gain score. Based on the results of the study, the researcher provides the following suggestions: 1) Civics teachers can implement learning activities using the RADEC learning model assisted by crossword puzzles to improve students' critical and creative thinking abilities. 2) School policymakers can make learning activities using the RADEC learning model assisted by crossword puzzle media to be implemented in the school learning activities. 3) Readers can use this study as a reference if they would like to conduct a study related to the improvement of critical and creative thinking abilities in the civic education subject through the RADEC learning model assisted by crossword puzzle media. The conclusion provides the implication that civic education learning by applying the RADEC learning model assisted by crossword puzzle media can improve the critical and creative thinking skills of MTs

Ahmad Yani Jabung students, so in learning teachers must apply the RADEC learning model assisted by crossword puzzle media properly and correctly. Applying the RADEC learning model assisted by crossword puzzle media, students will be more critical and creative in learning. Increasing critical and creative thinking in students will have an impact on increasing Civics learning outcomes for students.

Competing interest

The authors have declared that there is no competing interest.

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