IMPROVING THE MATHEMATICAL CREATIVE THINKING ABILITY OF ELEMENTARY STUDENTS THROUGH THE CRH LEARNING MODEL ASSISTED BY MONOPOLY GAME MEDIA

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ABSTRACT
This research is motivated by the students' low mathematical creative thinking abilities. The purpose of this research is to examine the achievement and improvement of students' mathematical creative thinking abilities whose learning uses the Course Review Horay (CRH) learning model assisted by monopoly game media. This research is a quasi-experimental type with pretest-posttest control group design with experimental class using Course Review Horay (CRH) learning model assisted by monopoly game media and control class using conventional learning. The population in this study were fifth-grade elementary school students in Cimahi City, while the samples were 30 students each for the experimental and control classes. Data collection techniques used are tests, observations, and documentation with data analysis using statistical data analysis. The results showed the average experimental class value of pretest reached 4.97 and the posttest reached 11.97 with an N-gain value of 0.46. While in the control class the average pretest value reached 4.50 and the posttest reached 9.70 with an N-gain value of 0.34. It can be concluded that the use of CRH learning models assisted by monopoly game media is more effective in achieving and increasing students' creative thinking abilities compared to conventional learning.

Keywords: Creative Mathematical Thinking, Course Review Horay, Monopoly

INTRODUCTION
The industrial era 4.0 and the era of globalization in the 21st century today, creative power becomes a very important part in the educational process, especially to build resilience to situations of disruption that can come at any time. This is according to the opinion of Griffin (Rabbani et al., 2018), the social abilities / skills that children must possess to face globalization in the 21st century, namely: Creativity and Innovation; Critical Thinking, Problem Solving, And Decision Making; Learning To Learn, Metacognition; Communication; Collaboration, Teamwork; Information Literacy; ICT Literacy; Elaboration of Key Concepts of ICT Literacy Based on Ets Framework; Citizenship, Local And Global; Life and Career; Personal and Social Responsibility. From Griffin's statement above creativity becomes
an important thing that must be owned by someone in facing globalization in the 21st century. This can be understood because creativity can be the basis for the process of producing creative products, namely the ability to produce something new, both in the form of ideas and real work which is relatively different from what has been before. According to (Cahyaningsih & Ghufron, 2016) someone who has the ability to think creatively will produce something new from something that already exists and give birth to something unique in accordance with his idea.

The ability to think creatively is also important taught to students for mathematics in school. The importance of developing creativity in mathematics is found in the 2013 Curriculum. This is proven by the existence of Government Regulation Number 17 of 2010 in the 2013 Curriculum (Purwaningrum, 2016) concerning the management and administration of education, stating that the objective of organizing primary and secondary education is to build a foundation for developing the potential of students in order to become knowledgeable, capable, critical, creative and innovative human beings. One criterion regarding the qualifications of graduate abilities that must be possessed by students is to have the ability to think creatively in the abstract and concrete realms in accordance with what is learned in schools and other similar sources.

Creative thinking is a high-level ability and is a continuation of basic abilities. Creative thinking skills are built by concepts that are already embedded in students and then the concepts and principles that already exist are applied by students in solving a problem (Hasanah, Darmawan, & Nanang, 2019). This is by the opinion of Eryync (Mursidik, Samsiyah, & Rudyanto, 2015) which states that creativity plays an important role in the cycle of advanced mathematical thinking. Furthermore (Sugilar, 2013), "Human activities cannot be separated from thinking activities. One of the activities of thinking is when solving a problem or determining the right strategy in making a decision ". Therefore, by thinking creatively students can find and determine new things in solving a problem. Through creative thinking, students are not only able to understand the lessons learned but also can think about how to solve the problems that they are facing. By thinking creatively it will prevent students from fixating on learning so that they become more active students (Suitriani, Arini, & Garminah, 2016).

Munandar (Purwaningrum, 2016) explains that the characteristics of creative thinking abilities are as follows: a. Fluency (fluent thinking skills) is smooth thinking skills that have the characteristics of triggering many opinions, answers, problem-solving, providing many ways or suggestions in doing things, and always thinking of more than one answer; b. Flexibility (the ability to think flexibly) that is the ability to produce ideas, answers, or questions that vary, can see a problem from different points of view, look for many alternative solutions to different and able to change the approach; c. Originality is the ability to give birth to new and unique ideas, think of unusual ways to express themselves and be able to make unusual combinations; d. Elaboration (detailing skills) is the ability to enrich and develop an idea or product and add or detail in detail from a situation so that it is more interesting.

The importance of the mathematical creative thinking ability that students must have above is different from the facts in the field. This is consistent with research conducted (Mursidik, Samsiyah, & Rudyanto, 2015) by interviewing several teachers in one of the SDNs in Magetan Regency, students are less interested in mathematics and students' creative mathematical thinking abilities are generally still said to be lacking. This is because students are only given routine questions and are rarely given high-level questions. The results of the researchers' interviews with teachers at one of the state elementary schools in Cimahi City also showed the same thing. Students have not been able to develop ideas or find other ways of mathematical problems given by the teacher.

From the problems above, an appropriate learning solution is needed, which can encourage students to be more active, creative, and able to reason to achieve the competencies expected and more motivated to learn mathematics. Thus, to improve the mathematical creative thinking abilities of elementary school students, researchers used a cooperative learning model namely the Course, Review, Horay (CRH) model. According to (Ani, Garminah, & Suwartama, 2016), the Course Review Horay (CRH) Learning Model is used to, "Test student understanding by using columns filled with numbers randomly, this column is used to write answers according to questions read by the teacher. The first group to get the right mark has the right to shout the group's hoorays or yells. "Learning with the CRH model also trains students to achieve
social relations goals which ultimately affect student academic achievement (Sari & Julianto, 2018). Kurniasih and Sani (Suitriani, Arini, & Garminah, 2016) stated, “The CRH learning model is a learning model that can create a lively and fun classroom atmosphere because every student who can answer correctly then the student is required to shout “hooray” to increase student activity in class.” Through this learning model, students can be facilitated by a series of learning processes oriented to the development of creative thinking (Course), open the possibility to interact between different processes and products of thinking through the Review stage, and all students can express their joy when they succeed in achieving common goals in learning. According to (Shohimin, 2014) the advantages of CRH learning models are as follows:

1) The learning is interesting and encourages students to be able to plunge into it.
2) The learning is not monotonous because it is interspersed with a little entertainment so the atmosphere is not tense.
3) Students are more enthusiastic about learning because the learning atmosphere is fun and practicing collaboration.

CRH learning model will be more fun if it is packaged in the form of a game. Researchers try to combine CRH learning models with game media. The game media applied is a monopoly for mathematics in the discussion of data collection and presentation. The fundamental reason for researchers to take the monopoly game media is because monopoly game media can improve student achievement, especially in mathematics for elementary students (Rahma, Farida, & Suherman, 2017). Besides, previous research conducted by (Suitriani, Arini, & Garminah, 2016) on the application of the Course Review Horay (CRH) model assisted by game media, especially monopolies, can increase the activeness and learning outcomes of students.

From some of the results of these studies, it can be concluded that the application of the Course Review Horay (CRH) model assisted by monopoly game media can be utilized in the learning process in improving various aspects of knowledge in mathematics. The purpose of this research is to examine the achievement and improvement of students' mathematical creative thinking abilities whose learning uses the Course Review Horay (CRH) learning model assisted by monopoly game media.

**METHOD**

The method in this study is a quasi-experimental method. In quasi-experimental subjects are not randomly grouped, but researchers accept the state of makeshift subjects. This Quasi-Experimental study with non-equivalent pretest and posttest control group design (Ruseffendi, 2010). Both groups both received pretest and posttest, but only the experimental group was given treatment. Learning in the experimental class uses the Course Review Horay (CRH) model assisted by monopoly game media, while learning in the control class uses ordinary learning. The research design using the quasi-experimental method according to (Sugiyono, 2013) is as follows:

<table>
<thead>
<tr>
<th>Table 1. Research Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
</tr>
<tr>
<td>Experiment</td>
</tr>
<tr>
<td>Control</td>
</tr>
</tbody>
</table>

**Information:**

O : Pretest or posttest mathematical creative thinking abilities

X₁ : Learning with Assisted Course Review Horay (CRH) model monopoly game media

X₂ : Conventional learning

The population in this study were fifth-grade elementary school students in Cimahi City. The sample of this study was sixth-grade students at SD Cibabat Mandiri 3, amounting to sixty students. Determination of experimental and control classes using a purposive sampling technique, with the consideration that the distribution of students to both classes is evenly reviewed in terms of academic ability. Based on these techniques, the sample in the study is the VA class as an experimental class and the VB class as a control class, the number of students in each class is 30 students.

The instrument in this study used eight mathematical creative thinking ability tests. The validity of the data in this study uses content validity. To see the validity of the contents of this test, the instrument was tested on classes that had received material but were not statistically calculated but the instrument was reviewed and consulted with experts. From the study of instruments by experts, the number of instruments used was five questions with SMI 20. Data
collection techniques used were tests, observations, and documentation with data analysis using statistical data analysis.

Data analysis is a way for researchers to process and summarize data accurately. The first step to process data is to count pretest and posttest and N-Gain derived from the test results of mathematical creative thinking abilities. The first statistical test is the normality test. If the two classes are normally distributed then the next data is tested for homogeneity. If the data are not normally distributed, the researcher must perform the Mann-Whitney test.

RESULTS AND DISCUSSION
Results
The results of descriptive recapitulation of research data are as follows:

Table 2. Recapitulation of Mathematical Creative Thinking Ability

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Course Review Horay Assisted Learning Monopoly Game Media</th>
<th>Conventional Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>4.97, 11.97, 0.46</td>
<td>4.50, 9.7, 0.34</td>
</tr>
<tr>
<td>Posttest</td>
<td>2.67, 2.70, 0.18</td>
<td>2.9, 5, 0.15</td>
</tr>
<tr>
<td>N-Gain</td>
<td>0.34</td>
<td></td>
</tr>
</tbody>
</table>

Before the treatment of both classes is given, pretest is done first. The aim is to determine the initial mathematical creative thinking abilities of the experimental class and control class students, so that the initial abilities of the two classes can be outlined as equal or not. For statistical analysis of the pretest data performed using IBM SPSS Statistics 25 software. The following is the results of the hypothesis test of the pretest ability of mathematical creative thinking of the experimental and control classes:

Table 3. Pretest Hypothesis Test Results

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Course Review Horay Assisted Learning Monopoly Game Media</th>
<th>Conventional Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normality test</td>
<td>0.130</td>
<td>0.200</td>
</tr>
<tr>
<td>Homogeneity Test</td>
<td>0.626</td>
<td>Homogenous</td>
</tr>
<tr>
<td>T-test</td>
<td>0.504</td>
<td>H0 is accepted</td>
</tr>
</tbody>
</table>

Table 3 explains that the data are normal and homogeneous so that the next researcher uses the t-test. The statistical hypothesis is formulated as follows:

$H_0 : \mu_1 = \mu_2$ (There is no difference in the initial ability of elementary students to think creatively mathematically between those learning using the Course Review Horay learning model assisted by monopoly game media and those using ordinary learning)

$H_1 : \mu_1 \neq \mu_2$ (There is a difference in the initial ability of mathematical creative thinking of elementary school students between those learning using the Course Review Horay learning model assisted by monopoly game media and those using ordinary learning)

The testing criteria are as follows:

- If Sig. > 0.05 then $H_0$ is accepted
- If Sig. ≤ 0.05, then $H_0$ is rejected

T-test results indicate the value of Sig. 0.504 > 0.05. Following the testing criteria, $H_0$ is accepted meaning that there is no difference in the initial ability of mathematical creative thinking of elementary school students between those learning using the Course Review Horay learning model assisted by monopoly game media and those using conventional learning.

Furthermore, continued testing for posttest data to see the achievement of mathematical creative thinking ability of the experimental class and the control class. The first statistical test is the normality test. The following are the results of the
hypothesis test post-test mathematical creative thinking ability of the experimental and control classes:

Table 4. Posttest Hypothesis Test Results
Mathematical Creative Thinking Ability

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Class</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normality</td>
<td>Course Review Horay (CRH)</td>
<td>Not Normal</td>
</tr>
<tr>
<td></td>
<td>Assisted Learning Monopoly Game Media</td>
<td>Distribution</td>
</tr>
<tr>
<td>Mann Whitney</td>
<td>0.044</td>
<td>0.200</td>
</tr>
<tr>
<td>Test</td>
<td>0.004</td>
<td>H₀ is rejected</td>
</tr>
</tbody>
</table>

Based on the data in Table 4 it can be seen that Sig. in the experimental class is 0.044 and the control class is 0.200. In this test it can be concluded that the class is not normally distributed as a result the Mann-Whitney test is performed. According to (Ramachandran & Tsokos, 2009) the statistical hypothesis is formulated as follows:

H₀ : m₁ = m₂ (There is no difference in the achievement of mathematical creative thinking abilities of elementary school students between those learning using the Course Review Horay learning model assisted by monopoly game media and those using conventional learning)

H₁ : m₁ > m₂ (Achievement of mathematical creative thinking ability of elementary school students whose learning uses the Course Review Horay learning model assisted by monopoly game media is better than learning that uses conventional learning)

If Sig. (1-tailed) = \( \frac{1}{2} \times \text{Sig. (2-tailed)} > 0.05 \) then H₀ is accepted

If Sig. (1-tailed) = \( \frac{1}{2} \times \text{Sig. (2-tailed)} \leq 0.05 \) then H₀ is rejected

Based on the data in Table 4, it can be seen that Sig. (2-tailed) is 0.004 so Sig. (1-tailed) to \( \frac{0.004}{2} = 0.002 \), the value meets the Sig criteria. (1-tailed) \( \leq 0.05 \) then H₀ is rejected, which means the achievement of mathematical creative thinking ability of elementary school students whose learning using the Course Review Horay learning model assisted by monopoly game media is better than learning using conventional learning.

In addition to the pretest and posttest conducted statistical tests, normalized gain data also needs to be tested statistically. Normalized gain data is processed to see an increase in students' mathematical creative thinking abilities in each class group. As with the pretest and posttest data, normalized gain data must also be analyzed, while the steps to process normalized gain data are the normality test. The following are the results of the N-Gain normality test data processing experimental and control class data:

Table 5. N-Gain Hypothesis Test Results
Mathematical Creative Thinking Ability

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Class</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normality</td>
<td>Course Review Horay (CRH)</td>
<td>Not Normal</td>
</tr>
<tr>
<td></td>
<td>Assisted Learning Monopoly Game Media</td>
<td>Distribution</td>
</tr>
<tr>
<td>Mann Whitney</td>
<td>0.002</td>
<td>0.190</td>
</tr>
<tr>
<td>Test</td>
<td>0.012</td>
<td>H₀ is rejected</td>
</tr>
</tbody>
</table>

Based on the data in Table 5 it can be seen that Sig. in the experimental class is 0.002 and the control class is 0.190. In this test it can be concluded that the class is not normally distributed as a result the Mann-Whitney test is performed. According to (Ramachandran & Tsokos, 2009) the statistical hypothesis is formulated as follows:

H₀ : m₁ = m₂ (There is no difference in the increase in mathematical creative thinking skills of elementary school students between those
learning using the Course Review Horay learning model assisted by monopoly game media and those using conventional learning)

$H_1 : m_1 > m_2$

(Increased mathematical creative thinking ability of elementary school students whose learning uses the Course Review Horay learning model assisted by monopoly game media is better than learning using conventional learning)

Sig value must be divided in half because by using IBM SPSS Statistics 25 software where the value of Sig. conducted to see the two-party test. While that is used in this test to side with one party as the research hypothesis. According to (Uyanto, 2009) that the significant display of SPSS is for two-tailed (2-tailed) tests, because we will do a one-tailed (1-tailed) hypothesis test, then the value of Sig. (2-tailed) must be divided in half. Test criteria, namely:

If Sig. (1-tailed) = $\frac{1}{2} \times$ Sig. (2-tailed) > 0.05 then $H_0$ is accepted

If Sig. (1-tailed) = $\frac{1}{2} \times$ Sig. (2-tailed) ≤ 0.05 then $H_0$ is rejected

Based on the data in Table 5 it can be seen that Sig. (2-tailed) is 0.012 so Sig. (1-tailed) to 0.012 / 2 = 0.006, this value meets the Sig criteria. (1-tailed) ≤ 0.05 then $H_0$ is rejected, which means an increase in the mathematical creative thinking ability of elementary students whose learning using the Course Review Horay learning model assisted by monopoly game media is better than learning using conventional learning.

**Discussion**

In the first meeting for each class, in the experimental and control class, the mathematical creative thinking ability was tested. The pretest was conducted to see the students’ initial ability to the ability to think mathematically in both classes. From the results of the study showed that the abilities of the two classes were not very different even though the results obtained were still very low.

After the pretest, then each class is given treatment. The experimental class was treated using the Course Review Horay (CRH) learning model assisted by monopoly game media. The steps of CRH learning assisted by monopoly game media in the experimental class according to Sugandi modified from (Ani, Garminah, & Suartama, 2016) there are several phases in applying the CRH learning model assisted by monopoly game media which is applied in this study, namely: the first phase is to convey learning objectives and prepare students. In this phase, the teacher conveys the competencies to be achieved.

**Figure 1. Teacher Conveying Learning Objectives And Preparing Students**

The second phase is to present information. in this phase the teacher explains the material first, then the teacher instructs students to play a mathematical monopoly (MONMATH) where there are questions that measure the ability of mathematical creative thinking in groups in accordance with the provisions given by the teacher, then the teacher invites students to discuss the questions being worked on, provide opportunities to students to ask questions, and explain questions that are studied more deeply.

**Figure 2. Teacher Conveying Information And Rules For Playing MONMATH**

The third phase is organizing students in learning teams. In this phase the teacher instructs students to fill in the numbers in the answer sheet columns in groups, then the teacher reads questions in a sequence and students write answers in the columns according to the number of questions read
by the teacher. Then in phase four, help with teamwork and learning. In this phase, the teacher and students discuss and discuss the questions that have been given, if true filled in the correct sign (√) and if incorrectly filled in the sign (X), for groups who get the correct sign vertically, horizontally, or diagonally have the right to shout the word "hooray".

Researchers' findings in the field of experimental class students learning using the Course Review Horay (CRH) learning model assisted by monopoly game media are students more enthusiastic and active when learning takes place compared to students who get conventional learning. Besides, students in the experimental class were very excited because learning was not monotonous and students were trained in cohesiveness and competitiveness with other groups. Then the findings obtained, students' creative thinking skills from the results of the worksheet that have been given by the teacher in the experimental class are better than the control class.

After being given treatment, both classes were given a posttest to measure the achievement and improvement of students' mathematical creative thinking abilities. From the results of the posttest given, it can be concluded that the use of CRH learning models assisted by monopoly game media is more effective in achieving and increasing students' creative thinking abilities compared to conventional learning.

**CONCLUSION**
Based on the findings in this study, the researchers concluded that the use of CRH learning models assisted by monopoly game media was more effective in achieving and increasing students' creative thinking abilities compared to conventional learning.

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