
The Influence of Jigsaw Cooperative Learning Model Assisted by Interactive CD Media and Teams Games Tournament (TGT) Assisted by Interactive CD Media Toward Critical Thinking Skills of Elementary Students

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Abstract. This quasi experimental research aims to find out (1) the influence of cooperative learning model Jigsaw assisted by interactive CD media to critical thinking skill, (2) the influence of cooperative learning model of TGT assisted by interactive CD media to critical thinking skill, (3) significant difference between Jigsaw assisted by interactive CD media and TGT assisted by interactive CD media to critical thinking skill. The population is the fourth graders of elementary school in Gebog Subdistrict Kudus District in the academic year 2017/2018. The data analysis used is t test analysis technique. The result of this research are (1) there is influence of cooperative learning model jigsaw assisted media CD interactive to critical thinking skill, (2) there is influence of cooperative learning model of TGT assisted by interactive CD media to critical thinking skill, (3) there is no significant difference between cooperative learning model Jigsaw assisted by interactive CD media and TGT with interactive CD media to critical thinking skill.

INTRODUCTIONS

The development in this era (21th era) has been full of various progress and educational challenge. To overcome all challenge in 21th era, National Education Standards Agency (BSNP, 2010: 43) formulates eight paradigm of national education such as; education not only makes students knowledgeable but also follows scientific attitudes and toward science and technology such as critical, logical, inventive and innovative, consistent followed by adaptability.

The success of students depends on the skill in 21th era, so the students should learn to maintain skills to overcome problem in this era. Every education units main task is to create people who are able to think critically according to the field of knowledge. Therefore, the learning that have been conducted in shools should support the development of critical thinking skills from students (Rotherham, 2009)

According to Glaser (in Fisher, 2007: 3) critical thinking is an attitude to think deeply about problems that need checking and logical thinking method. Paul dan Linda (2007: 2) said “*Critical thinking is the art of analyzing and evaluating thinking with a view to*

improving it”. It means that critical thinking is an art of analyze and evaluate thinking aims to improve thinking skills. Paul (Sham, 2016: 854) define critical thinking as “*the art of thinking about your thinking while you are thinking in order to make your thinking better: more clear, more accurate, more defensible*”. It means that critical thinking is the art of thinking about your own idea in order to make it clear, better, more accurate, and maintained.

From the explanation above, it can be concluded that critical thinking is a learning skills thouroughly, and it needs logical thinking in wise way, evaluating, trying to give clear and accurate reasons.

Critical thinking can be developed through studying mathematic that focus on system, structure, concept, principle, and relation between one element to another elements (Maulana, 2008: 39). But in fact, mathematic learning in elementary school is tend to lack practicing critical learning. Besides, mathematic learning in elementary school starts to train critical thinking skills (Juano, 2016: 3).

In the observation by Amir (2015: 161) in one of elementary schools in Sidoarjo, he finds out that students

learning was just directed to the concept recitation without paying attention and identifying critical thinking process. Widiantari (2016: 6) in order to analyze critical thinking skills, she said that the teacher has tried many critical thinking skills development on students, but there are some obstacle in the process of achieving indicators such as students obstacle to assumption identify indicator and assessments toward critical thinking skills is not available yet.

Some of the above are similar with the reality in the field that there are still many elementary students who have not been able to optimize their critical thinking skills because there are still many students who are only able to achieve the taxonomic process at the stage of remembering, understanding, and applying temporarily to the ability to analyze, evaluate and create still very less (observations of some elementary school teachers in Gebog District).

One alternative in learning to overcome the low level of critical thinking is to apply cooperative learning models. The application of cooperative learning model is an innovation in learning that can improve students' critical thinking skills. It can be seen from the results of Redhana's (2003: 1) study that critical thinking skills can be helped through cooperative learning.

Many types of cooperative learning models, including jigsaw and Teams Games Tournament (TGT). Jigsaw is learning that requires collaboration between groups formed into several expert groups. The steps of the jigsaw learning model according to Murtono (2017: 57) are (1) forming the original group, (2) introducing the topic, (3) the teacher presenting lessons, (4) each group member is appointed as an expert in a particular field and assembles into groups experts, (5) all expert members return to the original group to explain the material of the expert group to other members of the original group, (6) the teacher gives a quiz, (7) the teacher gives an award, (8) the teacher and students make conclusions.

The concept of the jigsaw cooperative learning model assisted by interactive CD media is the learning that takes place in design with a jigsaw learning model and by adding interactive

CD media into it. The use of interactive CD media is applied in step five, where after students are divided into several expert groups, interactive CD media is given to students.

The Teams Games Tournament (TGT) cooperative learning model is one of the cooperative learning models that has the advantage that higher mental functions will appear in conversation or collaboration between individuals. There are several components of the TGT cooperative learning model (Slavin, 2005: 166 and Murtono, 2017: 64) namely 1) presentation in class, (2) team, (3) game, (4) Tournament, (5) team recognition.

The concept of TGT cooperative learning model assisted by interactive CD media, namely the learning that takes place is designed with the TGT learning model and by adding interactive CD media into it. The use of interactive CD media is applied in the TGT cooperative learning model in the second stage, namely in group formation, where after students are divided into several groups, the material in the interactive CD media is given to students.

With the development of technology teachers should use audio visual aids in the learning process. This is done to avoid verbalism that might occur if only using visual aids (Supriatna, 2009: 3). Interactive CD learning media is a media that confirms a multimedia format can be packaged on a CD (Compact Disk) with the aim of interactive applications in which users can navigate the program (Tim Medikomp, 1994).

The application of cooperative learning models mostly shows that there is an increase in students' critical thinking skills. Syamsederaa (2011) in his research concluded that media-assisted cooperative learning is a good GSP program used to improve mathematical critical thinking skills. The results of other cooperative learning studies related to critical thinking by Sele (2016) show that cooperative learning models have great potential in empowering metacognitive skills and students' critical thinking skills.

The purpose of this study was to find out: (1) the influence of interactive CD media assisted Jigsaw cooperative learning model on critical thinking skills (2) the influence of TGT cooperative learning model assisted by interactive CD

media on critical thinking skills (3) significant differences between Jigsaw cooperative learning model assisted by interactive CD media and TGT assisted with interactive CD media on critical thinking skills.

METHOD

This using Quasi Experimental (quasi-experimental research). In this study the variables used are: (1) independent variables: cooperative learning models; Jigsaw assisted with interactive CD media and TGT assisted with interactive CD media. (2) Dependent variables: critical thinking skills.

The population is fourth grade students in the academic year 2017/2018 in Gebog District, Kudus Regency. The sampling technique in this study was purposive sampling. The samples were grade IV students year 2017/2018 in SD N 2 Besito with 25 students (experimental class TGT cooperative learning model assisted by interactive CD media, SDN 1 Gondosari (experimental class interactive CD media assisted Jigsaw cooperative learning model) with 45 students, and SDN 1 Gribig with 39 students as a pilot group of critical thinking skills test instruments). Data collection techniques used in this study are tests and performance of critical thinking skills.

RESULTS AND DISCUSSION

Results

Before analyzing the results of the research data with the t test analysis technique, first the analysis of the analysis requirements are the normality test and

Tabel 2. Class of Performance Experiments Aspect

Experimental Class	Performace aspect	N	Rata-Rata (%)	Kriteria	
Jigsaw assisted by Interactive CD Media	Basic explanation	45	76.42	good	good
	Basic skills	45	82.31	good	
	Summing up	45	84.81	Good	
	Further explanation	45	74.54	fair	
	Strategy and tactics	45	82.13	good	
TGT assisted by Interactive CD Media	Basic explanation	25	78.89	good	good
	Basic skills	25	84.50	good	
	Summing up	25	86.67	Very good	
	Further explanation	25	76.67	good	
	Strategy and tactics	25	83.17	good	

homogeneity test. Based on the normality test using the One-Sample Kolmogorov-Smirnov Test, the sig value was obtained. Experimental class: interactive CD assisted jigsaw media: pretest = 0.060 and posttest = 0.103; TGT assisted interactive CD media: pretest = 0.200 and posttest = 0.320 sig value of all samples > $\alpha = 0.05$. So it is concluded that the sample is normally distributed.

Based on homogeneity testing with the Test of Homogeneity of Variances test, the pretest value: F arithmetic (1.112) <(3.98) F table with Sig count 0.295 > 0.05 and posttest F count (0.08) <(3.98) F table with sig count 0.931 > 0.05 So it can be concluded that the experimental class in this study is the same homogeneous or variance.

Based on tests and observations of performance on critical thinking skills that can be presented in the tables below:

Tabel 1. Score Data Critical Thinking Skill

Experimental Class		Pretest	Posttest
Jigsaw assisted by Interactive CD Media	N	45	45
	Mean	62.78	81.64
	Median	63.00	83.00
	Mode	60	83
	Min	56	63
TGT assisted by Interactive CD Media	N	25	25
	Mean	62.96	81.48
	Median	64.00	83.00
	Mode	64	83
	Min	56	63
	Max	70	90

1. Effect of Interactive CD Media Jigsaw Assisted Learning Model on Critical Thinking Skills

Analysis of Paired Samples Statistics t test found the value of critical thinking skills (pretest and posttest) obtained the mean difference value of -18,867, a negative sign means the posttest value is greater than the pretest. The results of $t_{count} > t_{table}$ ($18,025 > 2,015$) and sig value ($p = 0,000 < 0,05$) with a significance level of 5%, then H1 is accepted so that it can be stated that there is a difference between pretest and posttest. Because of the differences in finished values, it can be concluded that there is an effect of the use of Jigsaw cooperative learning models with interactive CD media on critical thinking skills in fourth grade elementary school students in Gebog District.

2. Effect of TGT Cooperative Learning Model Assisted by Interactive CD Media on Critical Thinking Skills

The results of the t-test analysis with Paired Samples Test found the value of critical thinking skills (pretest and posttest) obtained a mean difference value of -18,520, a negative sign means the posttest value is greater than the pretest. The results of $t_{count} > t_{table}$ ($13,815 > 2,064$) and sig value ($p = 0,000 < 0,05$) with a significance level of 5%, then H1 is accepted so that it can be stated that there is a difference between pretest and posttest. Because of the differences in finished values, it can be concluded that there is an effect of the use of the TGT cooperative learning model with interactive CD media on critical thinking skills in fourth grade elementary school students in Gebog District.

3. Difference Between Interactive CD Media Jigsaw Cooperative Learning Model and TGT Assisted Interactive CD Media Against Critical Thinking Skills

The results of the t-test analysis with the Independent Samples Test found an average difference of 0.164, with $t_{count} < t_{table}$ ($0.100 < 2$) and sig value ($p = 0.921 > 0.05$) with a significance level of 5%, then H1 was rejected so that it

could be stated that there was no significant difference between the jigsaw learning model assisted by interactive CD media and the TGT assisted interactive CD media on critical thinking skills in grade IV elementary school students in Gebog District.

Discussion

1. Effect of interactive CD media assisted Jigsaw cooperative learning models on critical thinking skills

Based on the test results stated that there was an influence of interactive CD media assisted jigsaw cooperative learning model on critical thinking skills. This is evidenced by the posttest value of 81.64 which is higher than the pretest value of 62.78. Furthermore, from the results of the calculation of Paired Samples Test obtained the mean difference value of 18,867 with a t value of 18,025 which is greater than t table 2,015 ($t_{count} > t_{table}$; $18,025 > 2,015$) and a significance value smaller than 5% ($p = 0,000 < 0.05$).

This happens because the experimental class that follows learning with the jigsaw cooperative model with interactive CD media can occur a positive relationship between students and students, teachers and learning resources which in this case include interactive CD media. This is so evident that when learning takes place students work together with positive interdependence and are independently responsible for the group.

By providing opportunities for students to set strategies and tactics of collaboration between group members to recognize problems, compile information, provide ideas, opinions, so that they can conclude and provide further explanation with the results of the work on the questions so that they can train high-order thinking skills (thinking skills high level) students who in this case can train and improve their critical thinking skills.

In his research Adams (2013: 73) concluded that jigsaw cooperative learning students naturally develop an interest in learning with their friends and through the discussions they learn from each other will increase the quality of

learning better. In addition, students can develop good social attitudes among students.

Another relevant research is Ariyanti (2013: 10) that there are differences in students' critical thinking abilities between those who participate in learning with jigsaw and conventional type cooperative learning models in fourth grade elementary school students so that it can be concluded that the jigsaw cooperative learning model affects critical thinking skills.

Syamsuduha (2011) the results of his research can be concluded that good media-assisted cooperative learning is used to improve mathematical critical thinking skills.

Related to the results of research and analysis of relevant research as mentioned above, it can be concluded that there is the influence of interactive CD media assisted type jigsaw cooperative learning model on critical thinking skills in fourth grade elementary school students in Gebog District.

2. The effect of the TGT cooperative learning model assisted by interactive CD media on critical thinking skills

Based on the test results stated that there is an effect of the TGT cooperative learning model assisted by interactive CD media on critical thinking skills. This is evidenced by the posttest value of 81.48 which is higher than the pretest of 62.96. Furthermore, from the results of the calculation of Paired Samples Test obtained the mean difference value of 18,520 with a t value of 13,815 which is greater than t table 2,040 ($t_{count} > t_{table}$; $18,520 > 13,815$) and a significance value smaller than 5% ($p = 0,000 < 0,05$).

This happened because the experimental class that followed the learning with the TGT cooperative model assisted by interactive CD media demanded student activity in the discussion and spurred to become the best team because of the tournament in the learning. Through tournaments students can discuss, think about finding a strategy that is fast and precise, skilled in using technology, and having experience in a tournament. Through discussion students can share their opinions, ideas, consider their own opinions or ideas of their friends by accepting or rejecting them to

fit the group's answers. Through this activity students can explore and hone their mind. This shows that learning with the Team Games Tournament type cooperative model assisted by interactive CD media will have a positive impact on improving critical thinking skills.

Relevant research is classroom action research by Rachmawati (2014: 3) who succeeded in improving students' critical thinking skills namely the ability to propose ideas, actions, and responses. Besides the ability to understand problems, the ability to solve problems, and the ability to conclude statements also increase.

Boleng (2014) in his research results shows that cooperative learning models significantly influence and can improve critical thinking skills and cognitive outcomes. The results of his research Sele (2016) show that cooperative learning models have great potential in empowering students' metacognitive skills and critical thinking skills.

Another study that is in line with this research is the classroom action research by Arifin (2013: 84). The results of his research show that by using the help of media monopoly in cooperative learning the team games tournament (TGT) type can improve students' critical thinking skills. Students are more focused and enthusiastic in learning, so understanding the material is more easily absorbed properly which can improve the achievement of learning outcomes and critical thinking skills because students have dared to answer questions from the teacher.

Based on the results of research and analysis of relevant research as mentioned above, it can be concluded that there is an effect of the TGT cooperative learning model assisted by interactive CD media on critical thinking skills in fourth grade elementary school students in Gebog District.

3. The Difference Between Interactive CD Media Aided Jigsaw Cooperative Learning Models and TGT Assisted Interactive CD Media Against Critical Thinking Skills

Based on the test results stated that there was no significant difference between the jigsaw learning model

assisted by interactive CD media and TGT assisted with interactive CD media on critical thinking skills. This is evidenced by found an average difference of 0.164, with t count < t table (0.100 < 2) and sig value ($p = 0.921 > 0.05$) with a significance level of 5%.

This happened because the two experimental classes which applied the cooperative learning model between jigsaw assisted interactive CD media and TGT assisted interactive CD media both showed a positive influence on critical thinking skills. Both experimental classes obtained the same average values of 81.64 (JigsawCD) and 81.48 (TGTCD), with only a slight average difference of 0.16.

Relevant research results by Faradhilah (2016) that there is no significant difference in critical thinking skills. Relevant research results by Anisah (2017) concluded that there were no differences in learning outcomes using STAD and TAI cooperative learning models.

Based on the results of research and analysis of relevant research as mentioned above it can be concluded that there is no significant difference between interactive CD-assisted Jigsaw cooperative learning models with TGT assisted interactive CD media on critical thinking skills in fourth grade elementary school students in Gebog District.

CONCLUSION

The conclusion of this study are (1) there is the influence of interactive CD media assisted jigsaw cooperative learning model on critical thinking skills, (2) there is the effect of Teams Games Tournament (TGT) cooperative learning model with interactive CD media assisted with critical thinking skills, (3) no a significant difference between the Jigsaw cooperative learning model assisted by interactive CD media and Teams Games Tournament (TGT) assisted by interactive CD media on critical thinking skills.

ACKNOWLEDGMENTS

Based on the conclusions above, suggestions that need to be considered to improve the quality of learning are that teachers must use cooperative learning models (media assisted Jigsaw or media assisted TGT) as one of the innovative

learning and able to stimulate the process of students' critical thinking skills.

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