J'THOMS (Journal Of Techonolgy Mathematics And Social Science) 3(1), 2023, 52-57
Url: https://ejurnal.ikippgribojonegoro.ac.id/index.php/JTHOMS

THE EFFECT OF THE COOPERATIVE LEARNING MODEL TYPE PREVIEW, QUESTION, READ, REFLECT, RECITE, REVIEW (PQ4R) ON STUDENTS' CRITICAL THINKING SKILLS ON THE CIRCLE

Stevanus Budi Waluya[1)], Nur Diyanti[2)], Dwi Erna Novianti[3)], *Puput Suriyah[4)], Dina Mariana[5)], Siska Puspitaningsih[6)]
[1]Universitas Negeri Semarang
email: budiw@mail.unnes.ac.id
[2]IKIP PGRI Bojonegoro
email: nurdiyanti660@gmail.com
[3]IKIP PGRI Bojonegoro
email: dwierna.novianti@gmail.com
[4]IKIP PGRI Bojonegoro
email: puput.suriyah@ikippgribojonegoro.ac.id*
[5]IKIP PGRI Bojonegoro
email: dina45535@gmail.com
[6]IKIP PGRI Bojonegoro
email: siska25puspita@gmail.com

* co-author: puput.suriyah@ikippgribojonegoro.ac.id

Abstract

The learning model used by the teacher affects the learning outcomes to be achieved. The PQ4R-type cooperative learning model was expected to improve students' critical thinking skills. This study aims to determine the effect of cooperative learning model type Preview, Question, Read, Reflect, Recite, Review (PQ4R) on students' critical thinking skills on the subject of the circle of class VIII even semester MTs Tarbiyatul Islam Soko in 2017/2018 academic year. The type of research used in this research is quasi-experimental design (pseudo-experimental). The population in the study were all students of grade VIII MTs Tarbiyatul Islam Soko in the 2017/2018 academic year. The samples used in the study were students of class VIII B as the control class and students of class VIII D as the experimental class. The research instruments in this study were observation sheets and test questions on students' critical thinking skills. The data analysis technique used was a statistical technique with t-test and prerequisite test analysis with Lilliefors test for normality test, Bartlett test for homogeneity test, and t-test for a balance test. The results showed that learning with a cooperative learning model type Preview, Question, Read, Recite, Reflect, Review (PQ4R) has a better influence on students' critical thinking skills. This can be seen from the magnitude of t_{hitung} that is -6.134 > 2.2906. The average of the last test also showed that the experimental class had better critical thinking skills than the control class, which was 81 for the experimental class and 70 for the control class. Based on the observation results on the application of the PQ4R type cooperative learning model in the experimental class at MTs Tarbiyatul Islam Soko, the average student learning activity is in the good category in each indicator, namely 75.69%; 72.74%; 70.65%; 74.65%; 73.09%; and 74.39%.

Keywords: *PQ4R type Cooperative Learning Model; Students' Critical Thinking Ability*

Introduction

The world of education plays an important role in creating reliable human resources that keep up with technological developments. Students as the golden generation of the nation's successors are required to have the ability to think logically, critically, carefully, effectively, and efficiently. These factors are needed in facing the challenges of an increasingly complex era. This can be realized through learning mathematics. However, there are still many students who think that math is a difficult and

© 2023 J'Thoms (Journal Of Techonolgy Mathematics And Social Science)
e-ISSN: 2829-3363

boring subject and some even say that math is scary. Moreover, math is closely related to formulas that students must master in solving a problem, especially circle material. This has an impact on student thinking which will be dominated by fear so that students' ability to think critically will not develop.

Given the importance of critical thinking, teachers need some strategies to develop students' critical thinking skills. One way that can be used is by implementing an interesting cooperative learning model. This learning model is the PQ4R type which will create active learning because students will be directly involved. PQ4R type cooperative learning model is a strategy to improve memory performance in understanding text substance. The PQ4R-type learning model is a question-and-answer generator that can encourage readers to process material more deeply and broadly.

The formulation of the problem in this study is "How is the effect of cooperative learning model type *Preview, Question, Read, Reflect, Recite, Review* (PQ4R) on students' critical thinking skills on the subject of the circle of students in class VIII even semester MTs Tarbiyatul Islam Soko in 2017/2018 academic year so that it has the aim to know the effect of cooperative learning model type *Preview, Question, Read, Reflect, Recite, Review* (PQ4R) on students' critical thinking skills on the subject of the circle of students in class VIII even semester MTs Tarbiyatul Islam Soko in 2017/2018 academic year.

According to Syah (Yuliana and Fajriah, 2013: 29) the PQ4R-type cooperative learning model question-and-answer generator can encourage text readers to process material more broadly and deeply. The PQ4R type cooperative learning model stands for *preview, question, read, reflect, recite, and review*. Hendi (2017: 39) says that the PQ4R learning model is a strategy to improve memory performance in understanding lessons so that it can train problem-solving skills in students. Meanwhile, according to Muhibbin, 2015: 144 The learning method that is considered capable of improving memory performance in understanding the substance of the text is the method created by Thomas and Thomson called PQ4R, which stands for *Preview, Question, Read, Reflect, Recite, Review*. As long as students follow the steps in this learning model well, student's critical thinking skills will be achieved. Trianto in (Yuliana and Fajriah, 2013: 29-30) suggests that the steps to be taken in the PQ4R-type cooperative learning model are as follows.

(1) *Preview*
Students start the learning by reading the topics in the text, main sub-topics, headings and sub-headings, sentences beginning or ending a paragraph, and chapter summaries.

(2) *Question*
The second step is to ask yourself questions for each chapter in the reading. Using headings and sub-headings or main topics and sub-topics, start the question with "what, who, why, and how".

(3) *Read*
Read the essay actively, in a way that the student's mind has to react to what he/she reads. Avoid long notes. Try to find answers to the questions posed earlier.

(4) *Reflect*
Reflect is an important component of the third step. During reading, students should not only remember or memorize but also try to understand the information presented by (a) relating the information to things they already know; (b) relating subtopics to key concepts or principles; (c) trying to resolve contradictions in the information presented; and trying to use the material to solve problems simulated and suggested from the subject matter.

(5) *Recite*
Students are asked to reflect on the information learned by stating the key points by filtering, asking, and answering questions.

(6) *Review*
In this step, students are asked to read brief notes or summaries that have been made and repeat the entire reading content if necessary and once again answer the questions posed.

© 2023 J'Thoms (Journal Of Techonolgy Mathematics And Social Science)
e-ISSN: 2829-3363

Mathematics learning so far has only centered on improving students' cognitive abilities. Whereas the essence of mathematics is the emphasis on the reasoning process needed in students' critical thinking skills. Critical thinking skills are the ability of a student to analyze a mathematical problem through rigorous examination. According to Sutawidjaja and Jarnawi (in Sunaryo, 2014: 44) stated that critical thinking is a systematic process that allows students to formulate and evaluate the beliefs of their own opinions. Critical thinking can be interpreted as a thought process to compile, organize, remember and analyze arguments and provide interpretations based on valid perceptions of logical reasoning.

Critical thinking is a high-order thinking skill that potentially increases students' critical analytical power. The improvement of students' critical analytical power is closely related to the improvement of students' intellectual ability. Therefore, developing the students' critical thinking skills in learning is an effort to improve students' learning results, Arnyana in (Setiawati and Aloysius, 2017: 3521).

Methods

The type of research used in this study is quasi-experimental design research (pseudo-experimental). In this study, no control or manipulation was carried out on all relevant variables except for some of the variables studied. According to Sugiyono (2017: 114), quasi-experimental design is used because in reality it is very difficult to get a control group used for research.

This research was conducted at MTs Tarbiyatul Islam Soko class VIII even semester of 2017/2018 academic year. This research was conducted for 7 months, from December to June, which began with the planning stage, the implementation stage, to the completion stage of the research. The independent variable in this study is the PQ4R learning model. While the dependent variable used is the critical thinking skills of students. The population in this study were all students of grade VIII in the 2017/2018 academic year at MTs Tarbiyatul Islam Soko.

The sample of this study is a class taken by probality sampling technique (Cluster Random Sampling), which is random sampling imposed successively on units or sub-populations. From the existing classes, two classes will be selected randomly. In this study, two classes were selected as samples, namely class VIII B with 36 students as the control class for the direct learning model and class VIII D with 36 students as the control class for the PQ4R type cooperative learning model. So that the number of samples in this research is 72 samples.

Data collection techniques in this study were carried out in three ways, namely observation, documents, and tests.

1) Observation

   The observation technique in this study aims to observe students' learning activities using the PQ4R-type cooperative learning model. This observation was conducted by an observer using an observation sheet.

2) Documentation

   Data collection with this documentation method was carried out by looking at and requesting documents related to student values to the school. The value obtained from the school is the grade of UAS Mathematics class VIII Odd Semester of the 2017/2018 academic year. This value is used as an initial prerequisite test in the study.

3) Test

   Data collection with the test method is used to measure the presence or absence and the ability of the object under study. This test aims to determine the level of students' critical thinking skills applied to the PQ4R-type cooperative learning model.

   The data analysis technique used was a statistical technique with *t*-test. Besides *t*-test, three other types of data analysis were also used, namely the balance test (t-test), the *Lilliefors* method, and the *Bartlett* method. The *t*-test was used to test the average balance between the experimental group and the control group. While the *Lilliefors* method and *Bartlett* method are used to test the requirements of the analysis, namely the normality test and homogeneity test.

© 2023 J'Thoms (Journal Of Techonolgy Mathematics And Social Science)
e-ISSN: 2829-3363

Before the research was conducted, a prerequisite test was carried out from the odd semester Mathematics UAS score data to find out whether the two classes used as samples were normally distributed, homogeneous, and balanced. If the three conditions have been met, then the research data analysis is carried out to test the hypothesis with the *t*-test.

Result and Discussion

Based on the results of observations on the application of the PQ4R type cooperative learning model in the experimental class of MTs Tarbiyatul Islam Soko, the average student learning activity is in the good category on each indicator, namely 75.69%; 72.74%; 70.65%; 74.65%; 73.09%; and 74.39%. This study hypothesis is that the PQ4R type cooperative learning model has a more significant effect than the direct learning model on students' critical thinking skills on the subject of Circles of class VIII even semester MTs Tarbiyatul Islam Soko in the 2017/2018 academic year. Based on the research hypothesis test using the *t*-test formula with a significance level of 0.05, it is obtained t_{hitung} at -6.134 while $t_{0,025;70}$ = 2.2906 with DK = {t | t < -2.2906 or t > 2.2906}, then H_0 is rejected. The means of the two classes are also different. The mean of the experimental class is much greater than the mean of the control class. The mean of the control class was 70, while the mean of the experimental class was 81. So, the PQ4R type cooperative learning model has a better effect than the direct learning model on students' critical thinking skills on the subject of Circles of class VIII even semester MTs Tarbiyatul Islam Soko in the 2017/2018 academic year.

The suitability of the test decision with the research hypothesis is because, in learning activities with PQ4R type cooperative learning model, students can develop critical thinking skills. Students can understand the problem, identify the problem, solve the problem, and conclude the problem. In addition, students can work together and be responsible, care for each other, and help each other to be able to analyze and solve problems so that each student can develop their critical thinking skills.

The steps in the PQ4R-type cooperative learning model encourage students to think critically. From the beginning of learning, students have been involved in the learning process. Students must understand what they see and read with their abilities. However, the teacher's role in guiding and directing students also determines the success of a learning process.

Conclusion

Conclusion

Based on the results of research that has been conducted on the effect of cooperative learning model type *Preview, Question, Read, Reflect, Recite, Review* (PQ4R) on students' critical thinking skills on the subject of circle students of class VIII even semester MTs Tarbiyatul Islam Soko obtained $t_{hitung} \in DK$ that is t_{hitung} = -6.134 with DK = {t | t < -2, 2906 or t > 2.2906}, it can be concluded that the cooperative learning model type *Preview, Question, Read, Reflect, Recite, Review* (PQ4R) has a better influence on students' critical thinking skills on the subject of students' circle class VIII even semester MTs Tarbiyatul Islam Soko in the 2017/2018 academic year.

Suggestion

Based on the above conclusions, there are some suggestions that can be useful for the implementation of further mathematics learning, namely:

1. For school

© 2023 J'Thoms (Journal Of Techonolgy Mathematics And Social Science)
e-ISSN: 2829-3363

Schools must actively help teachers to improve student achievement, especially their critical thinking skills by providing facilities and infrastructure that can support teaching and learning activities such as package books and LKS.

2. For teachers

   In determining the success in learning is strongly influenced by the learning model. Cooperative learning model type *Preview, Question, Read, Reflect, Recite, Review* (PQ4R) is suitable to be applied in learning, especially the subject of circles in improving students' critical thinking skills. This learning model can also be developed by using an appropriate learning media.

3. For students

   In applying the cooperative learning model of *Preview, Question, Read, Reflect, Recite, Review* (PQ4R) type, students must be aware of improving their reading habits.

4. For other researchers

   Other researchers who want to apply the cooperative learning model of *Preview, Question, Read, Reflect, Recite, Review* (PQ4R) type should be able to coordinate the time in learning, so that all stages can be achieved more optimally. In addition, it must also continue to guide or supervise each student and direct every learning activity so that students can be active and learning is maximized so that the researcher's objectives can be achieved.

List of References

Arikunto, S. (2013). *Dasar-Dasar Evaluasi Pendidikan*. Jakarta: PT Bumi Aksara.

Budiyono. (2003). *Metodologi Penelitian Pendidikan*. Surakarta: UNS Press.

Budiyono. (2009). *Statistika untuk Penelitian*. Surakarta: UNS Press.

Hendi, A. (2017). Pengaruh Model Pembelajaran Preview, Question, Read, Reflect, Recite, and Review (PQ4R) untuk meningkatkan Kemampuan Pemecahan Masalah Matematika Siswa. *Jurnal Pendidikan*, *2*(1): 39-53.

Huda, M. (2011). *Cooperative Learning*. Yogyakarta: Pustaka Pelajar.

Jihad, A. & Abdul, H. (2009). *Evaluasi Pembelajaran*. Yogyakarta: Multi Press.

Karim & Normaya. (2015). Kemampuan Berpikir Kritis Siswa dalam Pembelajaran Matematika dengan Menggunakan Model Jucama di Sekolah Menengah Pertama. *Jurnal Pendidikan Matematika*, *3*(1): 92-104.

Lestari, K. E. & Muhammad, R. Y. (2015). *Penelitian Pendidikan Matematika*. Bandung: PT Refika Aditama.

Setiawati, H. & Aloysius, D. C. (2017). Empowering Critical Thinking Skills of The Students Having Different Academic Ability in Biology Learning of Senior High School through PQ4R - TPS Strategy. *The International Journal of Social Sciences and Humanities Invention*, *4*(5): 3521-3526.

Sugiyono. (2017). *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R & D*. Bandung: CV Alfabeta.

Sugiyono. (2015). *Statistika untuk Penelitian*. Bandung: CV Alfabeta.

© 2023 J'Thoms (Journal Of Techonolgy Mathematics And Social Science)
e-ISSN: 2829-3363

Suprijono, A. (2015). *Cooperative Learning: Teori & Aplikasi Paikem*. Yogyakarta: Pustaka Pelajar.

Sunaryo, Y. (2014). Model Pembelajaran Berbasis Masalah untuk Meningkatkan Kemampuan Berpikir Kritis dan Kreatif Matematik Siswa SMA di Kota Tasikmalaya. *Jurnal Pendidikan dan Keguruan, 1*(2): 41-51.

Syah, M. (2015). *Psikologi Belajar*. Jakarta: PT Raja Grafindo Persada.

Tinah. (2010). *Pengaruh Model Pembelajaran Elaborasi Metode PQ4R terhadap Hasil Belajar Matematika Siswa*. Skripsi tidak diterbitkan. Jakarta: FITK USH.

Yuliana, I. & Noor, F. (2013). Penerapan Metode PQ4R dalam Pembelajaran Matematika di Kelas VII SMP. *Jurnal Pendidikan Matematika, 1*(1): 27-33.

© 2023 J'Thoms (Journal Of Techonolgy Mathematics And Social Science)
e-ISSN: 2829-3363