

# Students' reading interest in biology learning model based on remap CIRC, GI and TGT

*by* Nur Hayati

---

**Submission date:** 25-Oct-2020 04:06PM (UTC+0700)

**Submission ID:** 1425646476

**File name:** 2\_15764\_Nurhayati.docx (388.97K)

**Word count:** 6823

**Character count:** 39801



## Students' reading interest in biology learning model based on remap CIRC, GI and TGT

Nur Hayati<sup>1\*</sup>, Siti Zubaidah<sup>2</sup>, Susriyati Mahanal<sup>2</sup>

<sup>1</sup> Natural Science Education, Faculty of Science Education, Universitas Hasyim Asy'ari, Indonesia

<sup>2</sup> Biology Education, Faculty of Mathematics and Natural Sciences, Universitas Negeri Malang, Indonesia

\*Corresponding author: [nurhay.ht@gmail.com](mailto:nurhay.ht@gmail.com)

### ARTICLE INFO

33

#### Article history

Received: 24 June 2020

Revised: 30 September 2020

Accepted: 3 October 2020

#### Keywords:

Concept Map

Cooperative

Remap Couple



### ABSTRACT

This study aims to determine the differences in students' reading interest in biology learning models based on remap CIRC, GI, and TGT. It is a quasi-experiment implemented in Public High School N of Malang, Indonesia and Public High School S of Malang, Indonesia in the odd semester of 2014/2015. The research population was all students of 10<sup>th</sup> grade of Public High School of Malang, Indonesia. The sampling technique was random sampling. The research sample consisted of 10<sup>th</sup>-grade science 1 of Public High School N of Malang, Indonesia, 10<sup>th</sup>-grade science 2 of Public High School N of Malang Indonesia, and 10<sup>th</sup>-grade science 1 of Public High School S of Malang, Indonesia as an experiment group; and 10<sup>th</sup>-grade science 3 of Public High School N of Malang, Indonesia as a control group. The analysis was carried out in a quantitative. The result showed that the CIRC remapping learning model had the greatest influence on students' reading interest compared to GI and TGT. The students' reading interest scores using remap CIRC, GI, and TGT models were 82.90, 76.23, and 80.49. Remap CIRC, GI, and TGT model should be applied in biology learning because it can empower students' reading interest.

© 2020 Universitas Negeri Jakarta. This is an open access article under the CC-BY license (<https://creativecommons.org/licenses/by/4.0>)

Hayati, N., Zubaidah, S., & Mahanal, S. (2020). Students' reading interest in biology learning model based on remap CIRC, GI and TGT. *Biosfer: Jurnal Pendidikan Biologi*, 13(2), 167-182. <https://doi.org/10.21009/biosferjpb.v13n2.167-182>



## INTRODUCTION

Reading is a crucial skill (Ristanto, Zubaidah, Amin, & Rohman, 2018; Wu, 2012) and very important in both the learning process and communication. Today's educational world assumes reading lessons as an important first step in developing students' mental and language abilities (Alshumaimeri, 2011). Related to that, Iftanti (2012) explains that reading is a way to discover new things. Therefore, it is important to master reading skills for academic purposes and lifelong learning. Furthermore, the ability to read is the skill needed by students to comprehend various information being read (Ruslan & Wibayanti, 2019).

Reading has many benefits, not only to get information but also as a means of entertainment. However, some study shows that Indonesian have low interest in reading. The PIRLS study in 2011 placed the reading literacy ability of Indonesian students in the 42<sup>nd</sup> out of 45 PIRLS member countries with a score of 428 (Mullis & Martin, 2016). PISA for Indonesia on the reading indicator is ranked 72 out of 77 countries surveyed (Schleicher, 2019). Indonesian are more likely to fond of oral information than written, so reading activities are still not at the stage of a need (Pangestuti et al., 2015). In connection with this statement, the low interest in reading of Indonesian generally affects the quality of education, namely on students' thinking abilities, which in turn affects student learning outcomes. Reading is very important in learning because most of the knowledge is presented in written form so that students are required to read in order to gain knowledge (Harahap, Ristanto, & Komala, 2020; Zubaidah, 2014).

Based on the results of a narrower scope observations and interviews with students of 10th-grade science 2 of Public High School N of Malang Indonesia on September 22<sup>nd</sup>-29<sup>th</sup> 2014, it showed that the students' reading interest of 10th-grade science 2 of Public High School N of Malang, Indonesia is relatively low. Only 3.7% of students placed reading as hobby, 85% of them prefer to spend their free time playing with gadgets than reading, and only 7.4% of students read the material at home before being discussed in class. Based on these facts, it can be stated that students' interest in reading is classified as low. This also occurs in 10th-grade science 1 of Public High School N of Malang Indonesia and 10th-grade science 1 of Public High School S of Malang, Indonesia. The teachers have not tried to overcome students' low interest in reading for biology learning. It is only in the form of presenting the material in groups by students, being followed by some discussion, and strengthening the teacher's material.

To achieve learning objectives, integration between reading and writing in the classroom, teaching and learning is needed (Murok & Sofiana, 2017). Based on the outlined problems, a solution is given in the form of the application of a biology learning model based on reading-concept map-cooperative learning (remap coople), which is expected to increase students' interest in reading. This learning model is a combination of reading activities combined with the preparation of concept mapping and cooperative learning. This learning model requires students to read as an initial stage before face-to-face learning is implemented. In face-to-face learning, the teacher applies cooperative learning; then, students are asked to make a concept map at the end of the material. There were several previous studies related to remap coople; they are remap NHT (Dinnurriya et al., 2015; Mahanal et al., 2016; Purwaningsih et al., 2017), remap CIR (Hayati et al., 2015a; Hayati et al., 2015b), remap TPS (Tendrita et al., 2017; Setiawan et al., 2020), remap TGT (Pangestuti et al., 2015; Latif et al., 2015), remap STAD (Antika et al., 2015; Ramadhan et al., 2016; Pangestuti, 2017), remap GI (Prasmala et al., 2014; Mistianah et al., 2014; Zubaidah, et al. 2018), remap RT (Sholihah et al., 2016; Zubaidah et al., 2019), remap jigsaw (Zubaidah et al., 2018), remap CS (Kurniawati et al., 2016).

The remap coople learning model chosen in this study remap CIRC, GI, and TGT. Remap CIRC (Cooperative Integrated Reading and Composition) is a learning model that requires students to do reading text activities, master the main idea, think to find out the main ideas of the text, then retell and respond to each other's content (Djamahar, Ristanto, Sartono, & Darmawan, 2020; Ristanto & Darmawan, 2020). Through these activities, students are expected



to foster an interest in reading. Research has been conducted reveals that there is an effect of learning results by doing remap CIRC on students' reading interest (Hayati et al., 2015b).

The remap GI (Group Investigation) learning model has a philosophy of constructivism that requires students to build their knowledge, and teacher acts as a facilitator. During face-to-face learning through GI, students plan their assignments to be studied, carry out investigations, gather information, report the results of investigations, and provide feedback to each other on topics that have been studied. It is expected to increase students' interest in reading, seeing from gathering various information during the investigation. There is an increase in students' interest in reading by 7% with adopting the remap GI learning model (Prasmala et al., (2014). Furthermore, other findings also explained that students' reading interest with the remap GI learning model was higher than remap jigsaw (Zubaidah et al., 2018).

Remap TGT (Teams Games Tournaments) is unique cooperative learning because it uses educational games. In TGT learning, students must conduct Games and Tournaments after doing Teamwork. Applying TGT is expected to increase students' interest in reading because, with Games and Tournaments activities, students are more motivated to read. Pangestuti et al. (2015) reported the remap TGT application increased students' interest in reading.

Activities on remap CIRC, remap GI, and remap TGT can foster interest in reading, which will affect students' cognitive learning outcomes. Students are asked to read the material before face-to-face learning at the reading stage so that it can increase knowledge and students' interest in reading. Preparation of concept maps can also empower interest in reading, building understanding, and practicing students' thinking skills. This study was conducted to determine differences in students' reading interest in the biology learning model based on remap CIRC, remap GI, and remap TGT. This study is different from previous research related to remap coople model because it compares students' reading interest with three cooperative learning models, namely CIRC, GI, and TGT. This research is important because considering the low reading ability of Indonesian students needs to be improved through learning innovations in the form of remap combined with various cooperative learning models.

## METHODS

### Research Design

This research used a quasi-experiment since not all variables thought to affect search results are controlled (Maksum, 2018) with a descriptive quantitative method that aimed to find out the differences in students' reading interest in biology learning models based on remap CIRC, remap GI and remap TGT. It was conducted in the odd semester academic year 2014/2015 in Public High School N and Public High School S of Malang Indonesia. This research is applied in Basic Competencies about Virus, Archaeobacteria and Eubacteria, and Protist. Table 1 shows the research design used.

**Table 1**

Research Design of Reading Interest based on Remap Coople

Group A	O <sub>1</sub>	X <sub>1</sub>	O <sub>2</sub>
Group B	O <sub>3</sub>	X <sub>2</sub>	O <sub>4</sub>

Table 1 shows that group A is the experimental group that is taught by using remap CIRC, GI, and TGT. Group B is the control group taught by using a scientific approach based on the school curriculum applied. O<sub>1</sub> and O<sub>3</sub> are students' questionnaires given at the beginning of the learning process, while O<sub>2</sub> and O<sub>4</sub> are shown at the end of the learning process. X<sub>1</sub> is a biology learning model based on remap CIRC, remap GI, and remap TGT, while X<sub>2</sub> is a biology learning model using a scientific approach.

## Population and Samples 30

The population used in this research was all students in the 10<sup>th</sup> grade of Public High School of Malang, Indonesia, which consisted of 10 schools. From the research population, an equivalence test was carried out using the Duncan test based on the students' National Exam (UN) scores when entered high school. In principle, this equivalence test is a test of different classes for schools in the research population. The next stage is to determine the research sample using a random sampling technique, where the equivalent classes are then taken randomly to be the research sample. After that, determine the experimental class and control class randomly based on the sample.

The experimental group consisted of 26 students of 10<sup>th</sup>-grade science 1 of Public High School N of Malang, Indonesia, 25 students of 10<sup>th</sup>-grade science 2 of Public High School N of Malang Indonesia, and 31 students 10<sup>th</sup>-grade science 1 of Public High School S of Malang, Indonesia. The control group used was 26 students of 10<sup>th</sup>-grade science 3 of Public High School of Malang, Indonesia.

## Instrument

The instrument used in this research consisted of treatment and measurement instruments. The treatment includes syllabus, learning implementation plan, students' worksheet, and implementation sheet of learning syntax. Three observers observe the implementation sheet's filling. The measurement instrument was designed in the form of a questionnaire of reading interest, consisted of seven multiple-choice and three essays derived from Gambrell et al. (1996); Maldonado & Gonzalez (2010); Wanjari & Mahakulkar (2011). This measurement instrument has been tested for validity and reliability against 27 non-samples with valid and reliable results.

The questionnaire consisted of questions in the form of multiple choices and essays. The multiple-choice question grid contains: 1) how important reading is based on student perception, 2) kinds of reading text read by a student, 3) how often student reads biology book in a week, 4) how often student reads the non-biology book in a week, 5) the reasons encouraging the student to read biology book, 6) things making student is not interested in reading a book, 7) student's feeling when reading biology book. For the essay questions grid contains: 1) student's activity during break time, the reason they do it, kinds of the book the students usually read during break time and the topic the student most like, 2) a person who makes the student interested in reading, 3) kinds of biology book the student's prefer to read and the reason they like it.

The followings are an example of multiple-choice questions.

1. I read my biology book in one week...
  - a. never
  - b. one time
  - c. two times
  - d. more than two times
2. I read other reading materials besides biology books in one week...
  - a. never
  - b. one time
  - c. two times
  - d. more than two times
3. The reason I read the biology book is...
  - a. to spend my free time
  - b. because there will be a test
  - c. to complete the assignment given by the teacher
  - d. because accustomed to reading books and to increase knowledge



The followings are an example of essay questions.

1. What do you do when you have free time?

- a. playing
- b. watching television or listening to the radio
- c. reading the book
- d. playing gadget
- e. other (please mention it):

.....  
Why do you like these activities?  
.....

2. What reading material do you read more often?

- a. newspaper
- b. novel or comic
- c. internet articles
- d. textbooks
- e. other (please mention it):

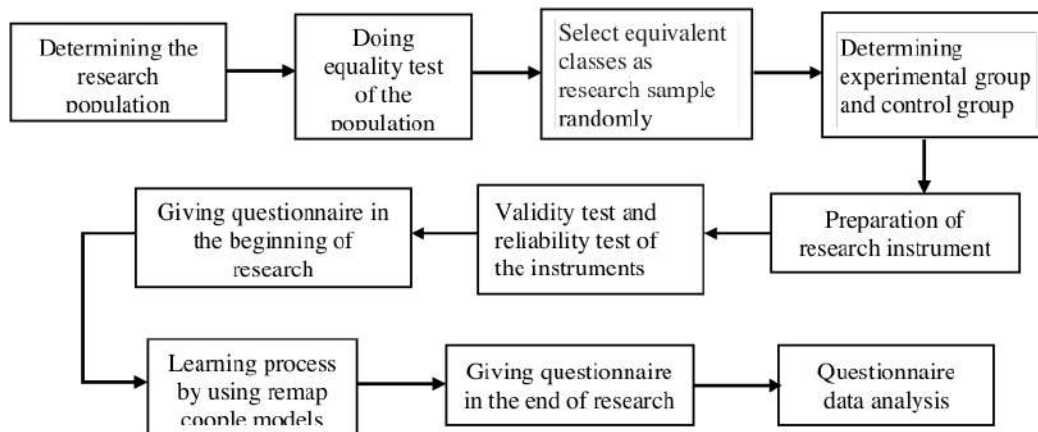
.....  
From these reading sources, what topic or title do you prefer?  
.....

### Procedure

The procedure process in doing the research consists of two stages. Thus are preparation and implementation stages. In the preparation stage includes: 1) determining the research population, 2) doing equality test of the population, 3) determining research sample randomly from equivalent classes based on the results of the equivalence test, 4) determining experimental group and control group based on the sample that has been selected, 5) doing observation and interview to the biology teacher in Public High School N of Malang Indonesia and Public High School S of Malang Indonesia, 6) build the research instrument, and 7) doing validity test and reliability test of the instrument on 27 students non-samples. As for implementation stages are: 1) giving questionnaire in the form of multiple-choice and essay questions to the students at the beginning of the research, 2) applying biology learning model based on remap CIRC, remap GI, and remap TGT, 3) giving questionnaire at the end of learning process to determine students' reading interest after applying remap coople.

Remap CIRC was applied in 10th-grade science 2 of Public High School N of Malang Indonesia; remap GI was applied in 10th-grade science 1 of Public High School N of Malang Indonesia; remap TGT was applied in 10th-grade science 1 of Public High School S of Malang Indonesia. The learning process was carried out based on the Learning Implementation Plan which refers to the syllabus. The last activity was given by providing the final reading interest questionnaire, which aimed to determine students' interest in reading after applying the remap coople learning model. Reading interest data were then analyzed to answer the research objectives. As for the research, the procedure is concluded in Figure 1.

Remap coople learning models include reading activities (reading the text), concept maps (preparation), and cooperative learning (application of cooperative learning models). First of all, the students were given the task to read the material to be studied at home. The next day, the teacher face-to-face gave number of questions to ensure students have read the material at home. Then, the application of remap coople in the class. The last stage, the students compiled concept maps related to the material they have learned. For further clarification, Table 2 presents remap coople syntax.



**Figure 1.** Research Procedure

**Table 2**

Remap Coople Syntax

Remap Coople Syntax		Explanation
Reading		Conducted at home by students
Concept map		Conducted at home by students
Cooperative learning	CIRC GI TGT	Conducted in the class

38

### Data Analysis Techniques

The data of this research were in the form of reading interest data, which were analyzed quantitatively by using analysis of covariance (ANCOVA) with a significance level of 0.05 ( $P < 0.05$ ). Before the covariance analysis was performed, a prerequisite test in the form of a normality test uses the Kolmogorov-Smirnov One-Sample test and a variant homogeneity test in the form of the Levene's Test of Equality of Error Variances was done. The summary of normality data test result of reading interest can be seen in Table 3.

**Table 3**

The Summary of Normality Data Test Result of Reading Interest

		Previous Reading Interest	Final Reading Interest
44		108	108
Normal Parameters (a,b)	Mean	73.4185	78.2019
	Std. Deviation	7.84631	9.50827
Most Extreme Differences	Absolute	0.111	0.161
	Positive	0.111	0.127
	Negative	-0.111	-0.161
Kolmogorov-Smirnov Z		1.152	1.472
Asymp. Sig. (2-tailed)		0.141	0.052

Based on the normality data test result in Table 3, it is known that the significance score of previous reading interest is 0.141 and the final reading interest is 0.052. It shows that the data more than 0.05, so the data is categorized as normal. Then, the result homogeneity data test result of reading interest is shown in Table 4.

**Table 4**

The Summary of Homogeneity Data Test Result of Reading Interest

	F	df1	df2	Sig.
Previous Reading Interest	2.224	3	104	0.090
Final Reading Interest	3.611	3	104	0.051

Based on Table 4, it is known that the significance score of previous reading interest is 0.090 and the final reading interest is 0.051. It shows that previous and final reading interest data is more than 0.05, so it is distributed homogeny.

## RESULTS AND DISCUSSION

Table 5 shows the average data increase of reading interest score in the control and experiment group through the biology learning model based on remap CIRC, remap GI, and remap TGT.

**Table 5**

The Data Average Increase of Reading Interest Score in Control and Experimental Group through Biology Learning Model based on Remap CIRC, Remap GI, and Remap TGT.

Group	Increase of Reading Interest (%)
Control	-0.66
Remap CIRC	15.87
Remap GI	3.47
Remap TGT	7.83

Based on Table 5, there is a decrease in the average score of reading interest in the control class by 0.66% at the end of the study. Meanwhile, there is an increase in the average score of reading interest in the class taught by the remap CIRC model, which is 15.87%. The average score of reading interest in the class taught by the remap GI model also increases by 3.47%. Lastly, the average score of reading interest in the class taught by the remap TGT model also increase by 7.83% at the end of the study. In summary, it is known that the biggest increase in reading interest score is in the class taught using the remap CIRC model.

The covariance analysis results to determine the effect of the biology learning model based on remap CIRC, GI, and TGT toward students' reading interest, as explained in Table 6.

**Table 6**

The Summary of Anacova Data Test Result of Reading Interest

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2679.507(a)	4	669.877	9.865	0.000
Intercept	2301.786	1	2301.786	33.898	0.000
XBACA	1273.439	1	1273.439	18.754	0.000
KELAS	1529.788	3	509.929	7.510	0.000
Error	6994.063	233	67.904		
Total	670152.334	108			
Corrected Total	9673.570	107			

a R Squared = 0.277 (Adjusted R Squared = 0.249)

It is known in Table 6 that F score of 7.510 with a significance value of 0.000 is smaller than 0.05, so there is an effect on the biology learning model based on remap CIRC, remap GI,



and remap TGT toward students' reading interest. Next, each learning model's effect difference toward students' reading interest is explained in [Table 7](#).

**Table 7**

The Effect Differences of Learning Model by using Remap CIRC, Remap GI, and Remap TGT toward Students' Reading Interest based on Anacova Test Result

Group	Xreading	Yreading	Difference	Readingcor	Notation LSD
Control	73.40	72.92	-0.48	72.93	a
Remap GI	73.88	76.44	2.57	76.23	b
Remap TGT	75.54	81.45	5.91	80.49	b c
Remap CIRC	70.33	81.50	11.17	82.90	c

<sup>2</sup> Based on [Table 7](#), it is known that the biology learning model based on remap CIRC, GI, and TGT have a significant influence on students' reading interest and are significantly different from the control class. The remap CIRC learning model has the most influence on students' reading interest compared to the remap GI and remap TGT, which is indicated by a corrected reading interest score of 82.90. The effect is also significantly different from the remap GI model, but not significantly different from the remap TGT model. The remap TGT learning model influences students' reading interest with a corrected reading interest score of 80.49, which is not significantly different from the remap GI model. The remap GI learning model had the least effect on students' reading interest compared to the remap CIRC and remap TGT models, as indicated by the corrected reading interest score of 76.23.

In this study, the biology learning model based on remap CIRC had the greatest influence on students' reading interest compared to the remap GI and remap TGT models because the remap CIRC syntax supported it. In the remap CIRC learning model, students conduct reading activities at the reading stage and at the time of CIRC implementation. At the reading stage, students are forced to read at the beginning of learning so as to foster a student's fondness for reading. Reading stage provides opportunities for students to read biology material from various sources, so that not only it can increase students' understanding of subject matter but also students' interest in reading.

During CIRC learning, the teacher presents the material using a reading text; then, students are directed to read it. Next, students work together to read out the main ideas of the text. The CIRC learning model allows students to read aloud while forcing them to read the text to easily find out the main idea. Citing an explanation from <sup>37</sup>the WWC Intervention Report (2012) that CIRC in daily learning provides students with opportunities to practice understanding and reading skills in pairs and small groups. Students in teams read each other, predict the conclusion, summarize the content, and write responses to questions raised by the teacher, decoding, and vocabulary (Ristanto et al., 2018; Harahap et al., 2020). In small groups, students are asked to understand the text's main ideas and rewrite the contents. As such, CIRC has the potential to enhance reading comprehension <sup>6</sup>for beginner readers positively. It was also stated in another source that CIRC was considered an effective and efficient strategy in teaching reading activities compared to conventional teaching (Karafkan & Aghazadeh, 2015; Gupta & Ahuja, 2014; Zarei, 2012).

The reading activity in the Student Worksheet during remap CIRC learning can train students to read more, further encouraging students' interest in reading. There is new information in the text of the student worksheet, which is not included in the textbooks. The information contained aims to develop the material to be understood, so students can add their reading material and enrich their knowledge of the concept. Still, they can also encourage interest in reading. Research by Yonatin (2014) reinforces this study's results that the CIRC method can create a more lively learning atmosphere and make students more interested in

reading.

The biology learning model based on remap GI has the least influence on students' reading interest compared to the remap CIRC and TGT models because the syntax of the GI learning model is more directed towards empowering students' thinking abilities. The remap GI model can empower students' reading interest during an investigation, where students are required to gather information from various sources. It emphasizes student self-direction through group-centered decision making. Remap GI makes students focused more on finding and overcoming problems that encourage them to think critically.

Students are forced to read at the beginning of learning to foster a student's hobby for reading at the reading stage. This stage provides an opportunity for students to read biology material from various sources, so that remap GI can increase students' understanding of the subject matter and students' interest in reading. The explanation was also strengthened by Prasmala et al. (2014) which is stated that the application of the remap GI model can increase students' interest in reading because it is a learning that forces students to do reading activities at the reading stage at the beginning of learning that can foster students' fondness for reading. Furthermore, Setiani & Razak (2019) revealed that reading is an activity that can increase students' knowledge. If students have more knowledge, it will be easier to identify and choose information in developing a conceptual framework.

Another factor influencing the low interest in reading among students in this study during the remap GI learning model was students interest on reading other types of reading than biology books. Also, students often did not have time to read due to many schoolwork assignments that must be finished or too preoccupied with school extracurricular activities. Rumainah (2018) explained that other factors also influence students' reading comprehension, including reading motivation and reading habits. It is suspected that students as the subject of this study are not accustomed to reading, especially concerning the subject matter. Furthermore, Alshumaimeri (2011) also stated that reading skills are obtained more through practice, not from educational backgrounds or teaching methods. Interest in reading can also be influenced by internal and external factors, especially social-psychological factors (Shehu, 2015).

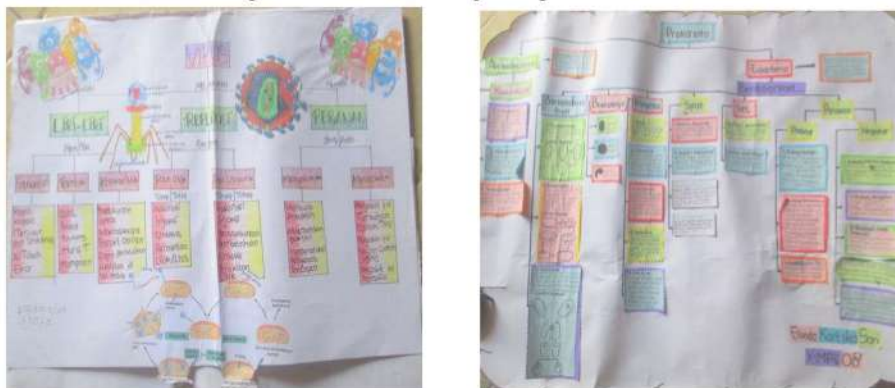
The remap TGT learning model's influence in this study is supported by the remap TGT model's syntax, which is at the reading stage, Games, and Tournaments. Students are asked to do a reading activity related to subject matter that can empower students' interest in reading at the reading stage. The Games and Tournaments stage can motivate students to read more subject matter so that with more reading, students can win every Games and Tournaments they participate. Students in the remap TGT class can interact well, decrease disruptive behavior in the class, and spend more time working on assignments together. These activities can optimize the emergence of various ideas from reading activities (Latif et al., 2015).

The results of this study are supported by Pangestuti et al. (2015) research, which shows that the application of biology learning models based on remap TGT can increase students' reading interest. In the application of remap TGT, a student can be a winner in the Games and Tournaments stage if they have more knowledge than their opponents, so students are more motivated to read more. By reading a lot at the "reading" stage, students will gain more knowledge. Students will have more motivation to increase the amount of reading that increases student reading interest through Games and Tournaments.

Students were directed to read material about Viruses, Archaeobacteria and Eubacteria, and Protists in this study. Students are given the task of reading at home about the subject matter to be studied. Students are also required to read again during the remap CIRC application, remap GI and remap TGT models in the class. In biology learning, students are required to read a lot to understand the material. Learning biology is not a form of memorization, but the most important thing is understanding the concept of biology. Students



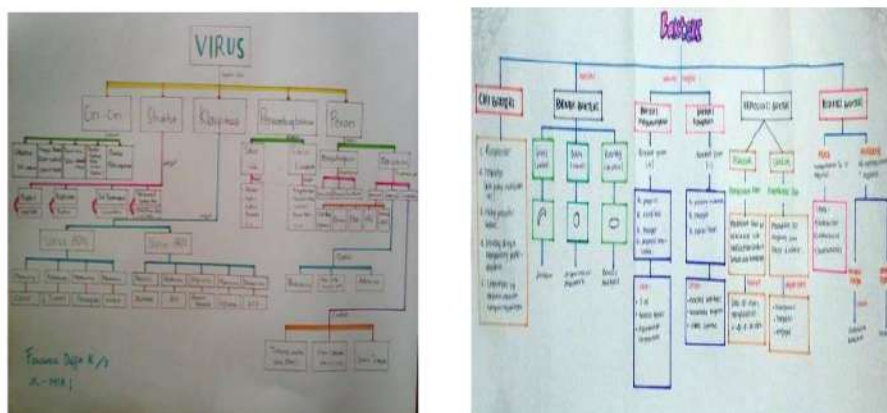
5 who read the material well will be able to master the concepts of biology. The concepts that have been obtained are then poured into a concept map.



5 **Figure 2.** The example of students' concept map in remap CIRC model



5 **Figure 3.** The example of students' concept map in remap GI model



47 **Figure 4.** The example of students' concept map in remap TGT model

35 The final activity of the remap couple learning model is the preparation of concept maps. At the end of the learning material, students are given the task of making a concept map. Students are given the freedom to produce concept maps according to their respective



creativity during making concept maps. The researcher only directs about the type of paper used to make the concept map. Based on the concept map that has been made, it can be seen that there are differences in concepts that students understand. Some students have been able to write the concept of the material in detail. Some are accompanied by related pictures and illustrations, as well as various colors to make the concept map look attractive. For the example of virus material, some students could write concepts in virus history, virus characteristics, virus structure, virus reproduction, the role of viruses, and virus classification. However, some students only wrote concepts about the characteristics of viruses, virus reproduction, and viruses' role in their concept maps. After students have collected the concept map, an assessment of the concept map is carried out. This assessment aims to determine how well the concept map has been produced so that the level of student understanding of the subject matter that has been read can be determined.

Making a concept map has an important role in increasing students' reading interest based on the depth of the concepts contained in the concept map. Concept maps are prepared individually by students at the end of each learning material that can be used to find how many concepts have been understood by students. Novak & Canas (2008) stated that concept maps are tools or ways that can be used to organize and acknowledge what students have already known. In the activity of preparing concept maps, reading has a very important role. In order to compile a good concept map, a student must understand the subject matter. A student will understand the subject matter if he has read the material. The reading stage of remap and reading stage of the text in CIRC facilitates student reading activities. Reading a lot can help students understand and remember new information related to the material. Figures 2, 3, and 4 are an example of a concept map made by students.

Reading interest and reading habits need to be developed because it will impact thinking ability, which in turn affects student academic achievement. Restuningsih et al. (2017) revealed that there are thinking activities that affect critical thinking skills in critical reading. Several studies also explained a significant and positive relationship between reading habits and student academic achievement (Lawrence, 2014; Jafari et al., 2019).

In this study, reading activities were carried out at home by students. Researchers provide a checklist to record data on students who have read the subject matter at home. However, the obstacle faced was the difficulty in measuring whether students were doing reading activities. At school since students' reading activities are limited by time only during biology lessons. Thus, the effort to foster students' reading interest and reading habits and instilling biological concepts is not easy, and it takes a long time. Besides, the application of cooperative learning models in the classroom often spends a lot of time conditioning students to develop reading interest, and biological concepts are not optimal.

## CONCLUSION

There was a significant difference in the science students' reading interest of the 10<sup>th</sup> grade of Public High School of Malang Indonesia in the learning model of remap CIRC, remap GI, and remap TGT. The score of students' reading interest with the remap CIRC model was 82.90; the score of students' reading interest with the remap GI model was 76.23, and students' reading interest with the remap TGT model was 80.49. Therefore, remap CIRC learning model has the best effect on students' reading interest compared to remap GI and remap TGT. So that, remap CIRC, remap GI, and remap TGT model should be applied in biology learning because it can empower students' reading interest. During the implementation in the classroom, the cooperative learning model's steps must be considered to lead students to enjoy reading activities and instill the concept of biology. A special instrument is needed that can measure whether students do reading activities at home. The efforts to foster reading interest are not easy. Research that aims

to increase reading interest should be carried out for a longer time in order to provide a better increase in reading interest.

7

## ACKNOWLEDGMENT

The authors would like to thank to the Directorate of Research and Community Service-Ministry of Research, Technology, and Higher Education of the Republic of Indonesia-General Directorate of Research, Reinforcement and Development, on research funding with a letter of assignment agreement No. 047/SP2H/LT/DRPM/II/2016 and No. 151/SP2H/LT/DRPM/III/2016, that has supported this research.

## REFERENCES

- Alshumaimeri, Y. (2011). The effects of reading method on the comprehension performance of saudi efl students. *International Electronic Journal of Elementary Education*, 4(1), 185–195. Retrieved from <https://www.iejee.com/index.php/IEJEE/article/view/220>
- Antika, L. T., Corebima, A. D., & Zubaidah, S. (2015). Pengaruh pembelajaran biologi berbasis reading-concept map-stad terhadap keterampilan metakognitif dan hasil belajar siswa kelas x sma malang. *Symbion: Symposium on Biology Education*, April, 150–157. <https://www.researchgate.net/publication/322315196>
- Dinnurriya, M. S., Zubaidah, S., & Mahanal, S. (2015). Penerapan model pembelajaran biologi berbasis reading-concept map- numbered heads together (remap nht) untuk meningkatkan keterampilan metakognitif dan hasil belajar kognitif siswa kelas x sma n 9 malang. *Symbion: Symposium on Biology Education*, April, 166–175. Retrieved from <https://www.researchgate.net/publication/322315747>
- Djamahar, R., Ristanto, R. H., Sartono, N., & Darmawan, E. (2020). Approaches to Respiratory and Excretion Systems Teaching: An Innovative Learning through Cirsa. *Universal Journal of Educational Research*, 8(6), 2204–2210. <https://doi.org/10.13189/ujer.2020.080602>
- Gambrell, L. B., Palmer, B. M., Codling, R. M., & Mazzoni, S. A. (1996). Assessing motivation to read. *The Reading Teacher*, 49(7), 518–533. <https://www.jstor.org/stable/20201660>
- Gupta, M., & Ahuja, J. (2014). Cooperative integrated reading composition (circ): impact on reading comprehension achievement in english among seventh graders. *IMPACT: International Journal of Research in Humanities, Arts and Literature*, 2(5), 37–46. Retrieved from <https://www.researchgate.net/publication/312198846>
- Harahap, L. J., Ristanto, R. H., & Komala, R. (2020). Getting critical thinking about ecosystem: How impact and responses of students about the CirGi learning model?. *Biosfer: Jurnal Pendidikan Biologi*, 13(1), 86–100. <https://doi.org/10.21009/biosferjpb.v13n1.86-100>
- Hayati, N., Zubaidah, S., & Mahanal, S. (2015a). Penerapan model pembelajaran biologi berbasis reading concept map cooperative integrated reading and composition (remap circ ) untuk meningkatkan hasil belajar kognitif siswa kelas x sma malang. *Symbion: Symposium on Biology Education*, April, 192–199. Retrieved from <https://www.researchgate.net/publication/322315526>
- Hayati, N., Zubaidah, S., & Mahanal, S. (2015b). Perbandingan minat baca siswa kelas x sma pada model pembelajaran biologi berbasis reading concept map circ (remap circ), reading





concept map gi (remap gi) dan reading concept map tgt (remap tgt). *Prosiding Seminar Nasional Biologi / IPA Dan Pembelajarannya, October*, 1522–1530. Retrieved from <https://www.researchgate.net/publication/325809643>

Iftanti, E. (2012). A survey of the english reading habits of efl students in Indonesia. *TEFLIN Journal*, 23(2), 149–164. Retrieved from <http://journal.teflin.org/index.php/journal/article/view/144>

Jafari, H., Aghaei, A., & Khatony, A. (2019). Relationship between study habits and academic achievement in students of medical sciences in kermanshah-iran. *Advances in Medical Education and Practice*, 10, 637–643. <https://doi.org/10.2147/amep.s208874>

Karafkan, M. A., & Aghazadeh, Z. (2015). Investigating the effects of group investigation (gi) and cooperative integrated reading and comprehension (circ) as the cooperative learning techniques on learner's reading comprehension. *International Journal of Applied Linguistics and English Literature*, 4(6), 8–15. <https://doi.org/10.7575/aiac.ijalel.v.4n.6p.8>

Kurniawati, Z. L., Zubaidah, S., & Mahanal, S. (2016). Model pembelajaran remap cs (reading concept map cooperative script) untuk pemberdayaan keterampilan berpikir kritis siswa. *Proceeding Biology Education Conference*, 13(1), 399–403. <https://jurnal.uns.ac.id/prosbi/article/view/5760>

Latif, M.A., Corebima, A. D., & Zubaidah, S. (2015). Minat baca dan hasil belajar kognitif peserta didik pada pembelajaran biologi berbasis reading-concept map – tgt. *Symbion: Symposium on Biology Education, April*, 176–181.

Lawrence, A. S. . (2014). Relationship between study habits and academic achievement of higher secondary school students. *Indian Journal of Applied Research*, 4(6), 143–145. <https://doi.org/10.36106/ijar>

Mahanal, S., Zubaidah, S., Bahri, A., & Dinnurriya, M. S. (2016). Improving students' critical thinking skills through remap nht in biology classroom. *Asia-Pacific Forum on Science Learning and Teaching*, 17(2), 1–19. Retrieved from [https://www.eduhk.hk/apfslt/v17\\_issue2/zubaidah/index.htm](https://www.eduhk.hk/apfslt/v17_issue2/zubaidah/index.htm)

Maksum, A. (2018). *Metodologi Penelitian dalam Olahraga* (Edisi kedua). Unesa University Press.

Maldonado, J. L., & Gonzalez, E. (2010). *Revised readin: gateway to learning*. Texas: Laredo Community College.

Mistianah, Corebima, A. D., & Zubaidah, S. (2014). Perbedaan keterampilan metakognitif dan hasil belajar biologi antara siswa yang diberi model pembelajaran reading-concept map-gi dengan reading-concept map-jigsaw di sma negeri kota malang. *Symbion: Symposium on Biology Education*, 182–191. <https://www.researchgate.net/publication/322315409>

Mubarok, H., & Sofiana, N. (2017). Cooperative integrated reading and composition (circ) and reading motivation: examining the effect on students' reading ability. *Lingua Cultura*, 11(2), 121–126. <https://doi.org/10.21512/lc.v11i2.1824>



- Mullis, I. V., Martin, M. O., & Sainsbury, M. (2016). PIRLS 2016 reading framework. *PIRLS*, 11-29. Retrieved from [https://timss.bc.edu/pirls2016/downloads/P16\\_FW\\_Chap1.pdf](https://timss.bc.edu/pirls2016/downloads/P16_FW_Chap1.pdf)
- Novak, J. D., & Canas, A. J. (2008). *The Theory Underlying Concept Maps and How to Construct and Use Them*. Retrieved from <http://www.ssu.ac.ir/fileadmin/templates/fa/Moavenatha/Moavenate-Amozeshi/edicupload/olymp-3.pdf>
- Pangestuti, A. A. (2017). Penerapan model pembelajaran biologi berbasis remap-stad untuk meningkatkan kemampuan berpikir kritis dan hasil belajar kognitif mahasiswa ikip budi utomo malang. *Edubiotik*, 2(1), 13-22. Retrieved from <http://ejurnal.budiutomomalang.ac.id/index.php/edubiotik/article/view/119>
- Pangestuti, A. A., Mistianah, Corebima, A. D., & Zubaidah, S. (2015). Using reading-concept map-teams games tournament (remap-tgt) to improve reading interest of tenth grade student of laboratory senior high school state university of malang. *American Journal of Educational Research*, 3(2), 250-254. Retrieved from <http://pubs.sciepub.com/education/3/2/19/>
- Prasmala, E. R., Zubaidah, S., & Mahanal, S. (2014). Penerapan model reading map group investigation (gi) untuk meningkatkan minat baca dan kemampuan berpikir kritis siswa kelas x sma surya buana malang. *Prosiding Seminar Nasional Biologi/IPA Dan Pembelajarannya, November*, 186-191. Retrieved from <https://jurnal.uns.ac.id/prosbi/article/view/7926>
- Purwaningsih, I., Mahanal, S., Prasetyo, T. I., & Zubaidah, S. (2017). Pengaruh model pembelajaran biologi reading-concept map-numbered heads together dan gender terhadap keterampilan berpikir kritis siswa kelas x sman 10 malang. *Prosiding Seminar Pendidikan IPA Pascasarjana UM*, 2, 466-473. <http://pasca.um.ac.id/conferences/index.php/ipa2017/article/view/1076>
- Ramadhan, F., Mahanal, S., & Zubaidah, S. (2016). Potensi remap stad (reading concept mapping student teams achievement division) untuk meningkatkan keterampilan berpikir kritis siswa. *Proceeding Biology Education Conference*, 13(1), 203-208. <https://www.researchgate.net/publication/322337436>
- Restuningsih, M. A., Nyoman, D., & Sudiana, N. (2017). Kemampuan membaca kritis ditinjau dari kemampuan berpikir kritis dan minat membaca pada siswa kelas v sd kristen harapan denpasar. *PENDASI: Jurnal Pendidikan Dasar Indonesia*, 1(1), 45-54. <https://doi.org/10.23887/jpdi.v1i1.2680>
- Ristanto, R. H., Zubaidah, S., Amin, M., & Rohman, F. (2018). From a reader to a scientist: developing cirgi learning to empower scientific literacy and mastery of biology concept. *Biosfer: Jurnal Pendidikan Biologi*, 11(2), 90-100. <https://doi.org/10.21009/biosferjpb.v11n2.90-100>
- Ristanto, R. H., & Darmawan, E. (2020). Biology reading literacy: Measurement and empowerment through circ learning model. *Journal for the Education of Gifted Young Scientists*, 8(4) 1305-1318. <https://doi.org/10.17478/JEGYS.679378>

- Rumainah. (2018). Undergraduate students' reading interest and reading comprehension achievement in a state islamic university. *Ta'dib: Journal of Islamic Education*, 23(1), 54–64. Retrieved from <http://jurnal.radenfatah.ac.id/index.php/tadib/article/view/2080>
- Ruslan, & Wibayanti, S. H. (2019). Pentingnya meningkatkan minat baca siswa. *Prosiding Seminar Nasional Pendidikan Program Pascasarjana Universitas PGRI Palembang*, 767–775. Retrieved from <https://jurnal.univpgri-palembang.ac.id/index.php/Prosidingpps/article/view/2633>
- Schleicher, A. (2019). *PISA 2018: Insights and Interpretations*. OECD Publishing. Retrieved from <https://eric.ed.gov/?id=ED601150>
- Setiani, R. E., & Razak, A. (2019). Implementation of reading concept map-group investigation (remap gi) model in biology learning to improve x grade students' learning outcomes and soft skills. *International Journal of Progressive Sciences and Technologies (IJPSAT)*, 14(1), 93–102. Retrieved from <https://ijpsat.ijsh-t-journals.org/index.php/ijpsat/article/view/857>
- Setiawan, D., Zubaidah, S., & Mahanal, S. (2020). Minat baca dan keterampilan metakognitif pada pembelajaran biologi melalui model pembelajaran remap think pair share. *JPBIO (Jurnal Pendidikan Biologi)*, 5(1), 88–95. <https://doi.org/10.31932/jpbio.v5i1.651>
- Shehu, I. (2015). Factors that influence students' reading comprehension achievement in the foreign language. *Anglisticum Journal (IJLLIS)*, 4(3), 28–32. Retrieved from <http://www.anglisticum.org.mk/index.php/IJLLIS/article/view/193>
- Sholihah, M., Zubaidah, S., & Mahanal, S. (2016). remap rt (reading concept map reciprocal teaching) untuk meningkatkan keterampilan berpikir kritis siswa. *Proceeding Biology Education Conference*, 13(1), 280–284. Retrieved from <https://jurnal.uns.ac.id/prosbi/article/view/5720>
- Tendrita, M., Mahanal, S., & Zubaidah, S. (2017). Pembelajaran reading-concept-map think pair share (remap tps) dalam meningkatkan hasil belajar kognitif. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, 2(6), 763–767. Retrieved from <http://journal.um.ac.id/index.php/jptpp/article/view/9332/4477>
- Wanjari, S., & Mahakulkar, V. (2011). Assessing reading habits of d.ed. trainee teachers. *ISRJ: Indian Streams Research Journal*, 1(1), 76–81. Retrieved from <http://oldisrj.lbp.world/ArchiveArticle.aspx?ArticleID=39>
- Wu, J. (2012). *The influence of extensive reading on junior high school students' reading motivation and reading performance in Taiwan*. (Tesis Magister. Colorado State University.) Retrieved from <http://hdl.handle.net/10217/67502>
- WWC Intervention Report. (2012). *Cooperative integrated reading and composition* (Issue June). [https://doi.org/10.1007/978-0-387-79061-9\\_4594](https://doi.org/10.1007/978-0-387-79061-9_4594)
- Yonatin, V. P. (2014). *Peningkatan kemampuan membaca pemahaman siswa kelas iii sd negeri congkrang ii muntilan melalui metode cooperative integrated reading composition (circ)*



(Skripsi Sarjana, Universitas Negeri Yogyakarta). Retrieved from <http://eprints.uny.ac.id/id/eprint/14108>

- Zarei, A. A. (2012). The effects of stad and circ on l2 reading comprehension and vocabulary learning. *Frontiers of Language and Teaching*, 3, 161-173. Retrieved from <https://www.researchgate.net/publication/312472049>
- Zubaidah, S. (2014). Pemberdayaan keterampilan penemuan dalam scientific approach melalui pembelajaran berbasis remap coople. *Prosiding Seminar Nasional XI Pendidikan Biologi FKIP UNS Biologi, Sains, Lingkungan, Dan Pembelajarannya*, 11(1), 1000-1011. Retrieved from <https://jurnal.uns.ac.id/prosbi/article/view/7970>
- Zubaidah, S., Corebima, A. D., Mahanal, S., & Mistianah. (2018). Revealing the relationship between reading interest and critical thinking skills through remap gi and remap jigsaw. *International Journal of Instruction*, 11(2), 41-56. <https://doi.org/10.12973/iji.2018.1124a>
- Zubaidah, S., Mahanal, S., Sholihah, M., Rosyida, F., & Kurniawati, Z. L. (2019). Using remap rt (reading - concept mapping - reciprocal teaching) learning model to improve low-ability students' achievement in biology. *Center for Educational Policy Studies Journal*, 10(3). 1-28. <https://doi.org/10.26529/cepsj.777>



# Students' reading interest in biology learning model based on remap CIRC, GI and TGT

## ORIGINALITY REPORT

12%

SIMILARITY INDEX

9%

INTERNET SOURCES

6%

PUBLICATIONS

1%

STUDENT PAPERS

## PRIMARY SOURCES

1	<a href="http://www.researchgate.net">www.researchgate.net</a> Internet Source	1%
2	<a href="http://www.ijsrp.org">www.ijsrp.org</a> Internet Source	1%
3	<a href="http://jurnal.radenfatah.ac.id">jurnal.radenfatah.ac.id</a> Internet Source	1%
4	<a href="http://journal2.um.ac.id">journal2.um.ac.id</a> Internet Source	1%
5	Intan Baizura Abd Ghani, Nor hasniza Ibrahim, Noraffandy Yahaya, Johari Surif. "Enhancing students' HOTS in Laboratory Educational Activity by using Concept Map as an Alternative Assessment Tool", Chem. Educ. Res. Pract., 2017 Publication	1%
6	<a href="http://media.neliti.com">media.neliti.com</a> Internet Source	<1%
7	Imas Sukaesih Sitanggang, Mirza	

Rakhmadianti, Husnul Khotimah. "Association patterns of hotspot sequence with socio-economic aspects in peatland in Sumatra", 2016 International Conference on Computer, Control, Informatics and its Applications (IC3INA), 2016  
Publication

---

<1%

8

Submitted to University of Surrey Roehampton

Student Paper

---

<1%

9

[eprints.uad.ac.id](http://eprints.uad.ac.id)

Internet Source

---

<1%

10

[karya-ilmiah.um.ac.id](http://karya-ilmiah.um.ac.id)

Internet Source

---

<1%

11

[lib.um.ac.id](http://lib.um.ac.id)

Internet Source

---

<1%

12

[digilib.iain-palangkaraya.ac.id](http://digilib.iain-palangkaraya.ac.id)

Internet Source

---

<1%

13

[scholarworks.waldenu.edu](http://scholarworks.waldenu.edu)

Internet Source

---

<1%

14

Indah Sari Dewi, Utami Sri Hastuti, Umi Lestari, Hadi Suwono. "The effects of kinds of lumus and the storage period on the quality of patin wadi based on the results of nutrient tests", AIP Publishing, 2017

Publication

---

<1%

15

[eprints.iain-surakarta.ac.id](http://eprints.iain-surakarta.ac.id)

Internet Source

<1%

---

16

[ejer.com.tr](http://ejer.com.tr)

Internet Source

<1%

---

17

D Diniya, D Rusdiana, H Hernani. "Promoting coupled-inquiry cycle through shared curricular integration models to enhance students argumentation", *Journal of Physics: Conference Series*, 2019

Publication

<1%

---

18

Changjia Li, Richard Grayson, Mark Smith, Joseph Holden. "Patterns and drivers of peat topographic changes determined from Structure-from-Motion photogrammetry at field plot and laboratory scales", *Earth Surface Processes and Landforms*, 2019

Publication

<1%

---

19

Noor Badari Khozali, Mageswary Karpudewan. "An Interdisciplinary Facebook Incorporated STEM Education Strategy in Teaching and Learning of Dynamic Ecosystems", *Eurasia Journal of Mathematics, Science and Technology Education*, 2020

Publication

<1%

---

20

[open.library.ubc.ca](http://open.library.ubc.ca)

Internet Source

<1%

---

21

Ruli Setiyadi, Uus Kuswendi, Muhammad Ghyats Ristiana. "DIGITAL LITERATION

<1%



THROUGH ONLINE MAGAZINE IN LEARNING  
READING COMPREHENSION IN  
ELEMENTARY SCHOOL", PrimaryEdu -  
Journal of Primary Education, 2019

Publication

22

Rina Hidayati Pratiwi, Iman Hidayat, Muhammad Hanafi, Wibowo Mangunwardoyo. "Antibacterial compound produced by *Pseudomonas aeruginosa* strain UICC B-40, an endophytic bacterium isolated from *Neesia altissima*", *Journal of Microbiology*, 2017

Publication

<1%

23

[labs.la.utexas.edu](http://labs.la.utexas.edu)

Internet Source

<1%

24

[www.scribd.com](http://www.scribd.com)

Internet Source

<1%

25

[www.educationalrev.us.edu.pl](http://www.educationalrev.us.edu.pl)

Internet Source

<1%

26

A Fatmawati, S Zubaidah, S Mahanal, Sutopo. "Critical Thinking, Creative Thinking, and Learning Achievement: How They are Related", *Journal of Physics: Conference Series*, 2019

Publication

<1%

27

[ejournal.umm.ac.id](http://ejournal.umm.ac.id)

Internet Source

<1%

28

[repository.uin-suska.ac.id](http://repository.uin-suska.ac.id)

<1%

29

Febrina Dafit, Dea Mustika, Ningrum Melihayatri. "PENGARUH PROGRAM POJOK LITERASI TERHADAP MINAT BACA MAHASISWA", Jurnal Basicedu, 2020

Publication

<1%

30

A D Safitri, Suparwoto. "Enhancing senior high school students' creative thinking skills using project based e-learning", Journal of Physics: Conference Series, 2018

Publication

<1%

31

[www.rumelide.com](http://www.rumelide.com)

Internet Source

<1%

32

Ivayuni Listiani. "EFEKTIVITAS MODEL PEMBELAJARAN SCIENCE TECHNOLOGY SOCIETY (STS) DISERTAI DENGAN MIND MAP (MM) UNTUK MEMBERDAYAKAN KETERAMPILAN PROSES SAINS SISWA", Premiere Educandum : Jurnal Pendidikan Dasar dan Pembelajaran, 2016

Publication

<1%

33

[escholarship.org](http://escholarship.org)

Internet Source

<1%

34

[eprints.radenfatah.ac.id](http://eprints.radenfatah.ac.id)

Internet Source

<1%

35

Siti Zubaidah, Susriyati Mahanal, Farqiyatur Ramadhan, Miswandi Tendrita, Nur Ismirawati. "Empowering Critical and Creative Thinking Skills through Remap STAD Learning Model", Proceedings of the 2nd International Conference on Education and Multimedia Technology - ICEMT 2018, 2018

Publication

&lt;1%

36

A Muslim. "The effect of cooperative learning Type Teams-Games-Tournaments (TGT) on mathematical connection and communication ability in elementary schools", Journal of Physics: Conference Series, 2020

Publication

&lt;1%

37

[worldwidescience.org](http://worldwidescience.org)

Internet Source

&lt;1%

38

[www.scientiasocialis.it](http://www.scientiasocialis.it)

Internet Source

&lt;1%

39

[library.upcebu.edu.ph](http://library.upcebu.edu.ph)

Internet Source

&lt;1%

40

"Rural Environment. Education. Personality. (REEP) Proceedings of the 12th International Scientific Conference", Latvia University of Life Sciences and Technologies, 2019

Publication

&lt;1%

41

Deborah L. Tolman, Laura A. Szalacha.

&lt;1%



# "Dimensions of Desire", Psychology of Women Quarterly, 2016

Publication

42

[moam.info](http://moam.info)

Internet Source

<1%

43

Amr Abdullatif Yassin, Norizan Abdul Razak, Nor Rizan Mohamad Maasum. "Investigating the Need for Computer Assisted Cooperative Learning to Improve Reading Skills Among Yemeni University EFL Students", International Journal of Virtual and Personal Learning Environments, 2019

Publication

<1%

44

Febrianty Shintya, Lisnawati Rusmin, La Ode Safiun Arihi. "PENGARUH MODEL PEMBELAJARAN PROBLEM BASED LEARNING TERHADAP PEMAHAMAN KONSEP SISWA PADA TEMA 7 INDAHNYA KERAGAMAN DI NEGERIKU KELAS IV SDN 26 KENDARI", Jurnal Ilmiah Pembelajaran Sekolah Dasar, 2020

Publication

<1%

45

[repository.radenintan.ac.id](http://repository.radenintan.ac.id)

Internet Source

<1%

46

Philip Hallinger \*. "Meeting the Challenges of Cultural Leadership: The changing role of principals in Thailand", Discourse: Studies in the

<1%

# Cultural Politics of Education, 2010

Publication

---

47

Maria Kordaki. "The challenge of multiple perspectives: multiple solution tasks for students incorporating diverse tools and representation systems", Technology, Pedagogy and Education, 2014

Publication

---

<1%

48

Akbar A. Jahanbakhsh, Mahdiah AliAsgariZamani, Zahra Garman. "CIRC and STAD in Iranian context: Through the five elements to cooperative learning of lexical collocations", Cogent Arts & Humanities, 2019

Publication

---

<1%

---

Exclude quotes      Off

Exclude matches      Off

Exclude bibliography      On