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THE CONTRIBUTIONS OF METACOGNITIVE SKILLS TOWARDS THE RETENTION OF DIFFERENT ACADEMIC ABILITY STUDENTS FOR THE IMPLEMENTATION OF SEVERAL LEARNING MODELS

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ABSTRACT

Metacognitive skills are self-regulation activities required to achieve active learning, critical thinking, problem solving, and decision making. There is a dearth of research on the contribution of metacognitive skills for the retention of students with varying academic abilities. This research study aims to fill this gap by suggesting learning models including READS (Reading, Exploring, Answering Discussing and Summarizing) learning model, Reading, Questioning and Answering (RQA) learning model and Conventional learning models. The sample of the study comprised 206 students divided into two equal groups of 103 students, each of high academic abilities and low academic abilities. The data was collected through a test and a rubric. The results of the regression analysis show that the READS learning model was better able to improve the metacognitive skills and retention of students with lower academic abilities compared to students with upper academic abilities. The results in the RQA learning model and conventional learning models show an increase in metacognitive skills and retention of students with higher academic abilities much faster than in students with low academic abilities. This suggests that the application of the READS learning model is more suitable for students with low academic abilities. The study recommends that teachers should learn to implement effective learning models to improve the metacognitive skills and retention of the upper and lower academic ability students.

Contribution/Originality: This study has endeavored to explore the possibility of designing learning models by enhancing metacognitive skills and retention of students with varying academic abilities. The study premises that students with low academic abilities can compete with students with high academic abilities if given the right learning model.

1. INTRODUCTION

Learning is the process of performing the steps of thinking to find or change information obtained to achieve understanding. Learning becomes more meaningful if the information obtained is not easily lost from memory

(Ardila, Corebima, & Zubaidah, 2013). The students who have good thinking skills will be able to learn successfully and store information for a long period of time, which is commonly called retention. Retention is a cognitive process that includes critical thinking, associating, remembering, and using all the knowledge and abilities that have been acquired (Banikowski & Mehring, 1999).

Retention is also an important indicator of the success of learning, because through retention teachers can find out how well students absorb information during the learning process, which is then stored in their long-term memory (Anderson & Krathwohl, 2001; Ausubel, 2000; Chakuchichi, 2011; Palennari, 2016). The stored information can be recalled even though it has been stored for a long period of time. In addition, it is assumed that the easier the information can be recalled, the better the students understand the information (Sukmawati, Ramadani, Fauzi, & Corebima, 2015).

Retention has a longer effect on students' conceptual understanding because the process of absorbing and storing information in long-term memory undergoes a very complex process compared to the conceptual understanding in general. According to Santrock (2004) the process of retention includes three important stages, namely *coding*, *storing* in memory, and *retrieving information* or recalling information that has been stored. The retention process involves two important points in the process of developmental psychology, namely Assimilation and Accommodation (Banikowski & Mehring, 1999; Santrock, 2004). Assimilation is the process of integrating new information into an existing schema of information that has been previously stored in the brain, while accommodation is a process of modifying an existing information or information that has been stored after new information is received (Ausubel, 2000). The new information which already goes through the process of assimilation and accommodation is the information understood by students. Good learning not only prioritizes conceptual understanding but also needs to pay attention to thinking processes and retention in gaining an understanding of information. Retention is also influenced by another factor, namely metacognition. Metacognition is an understanding of one's own understanding or thinking about one's own thinking (Bahri & Corebima, 2015; Palennari, 2016). Metacognition is divided into three types, namely, metacognitive knowledge, metacognitive experience, and metacognitive skills (Brown & DeLoache, 1978; Efklides, 2008; Ertmer & Newby, 1996; Pintrich, Wolters, & Baxter, 2000; Schwartz, 2001; Veenman, 2005). Metacognitive knowledge is a cognitive process that helps students store declarative knowledge in memory (Efklides, 2008; Fabricius & Schwanenflugel, 1994) while metacognitive experience is a learning process that helps students process and analyze the stored information (Efklides, 2006, 2008). Metacognitive skills are such cognitive abilities that help students find information (Veenman. & Elshout, 1999) by organizing and controlling learning activities (Brown & DeLoache, 1978; Flavell, 1992; Kluwe, 1987). According to Palennari (2016) metacognitive skills are the competencies needed to achieve active learning, critical thinking, problem solving, and decision making. Metacognitive skills also refer to *self-regulation* activities in the learning process and problem solving (Veenman, 2005). Metacognitive skills include the processes of planning, orienting, setting goals, selecting and using strategies, monitoring the implementation of strategies, examining and analyzing tasks, reflecting and recapitulating tasks (Azevedo, 2009; Baker, 1994; Moore, 2004; Mulbar, 2008; Pintrich et al., 2000; Reder, 1996; Veenman & Elshout, 1999; Veenman, 2007; Veenman, 1993). Thus, students who have good metacognitive skills will be able to learn systematically according to the plan and are able to track progress in learning, evaluate or *monitor* activities needed to find mistakes in learning. There have been many researches investigating the correlation between metacognitive skills and retention for the implementation of various learning strategies and learning models, such as those conducted by Ardila et al. (2013); Palennari (2016) and Schwartz, Andersen, Hong, Howard, and McGee (2004). Metacognitive skills are considered to play key roles in cognitive processes including understanding, communicating, interacting, remembering, and problem solving (Howard, 2004). According to Palennari (2016) metacognitive skills have a correlation with students' ability to remember the results of their learning (retention). The ability that students possess to solve problems varies or is heterogeneous. Teachers teaching in classrooms do not always pay much attention to the level

of students' ability. According to Prayitno, Corebima, Susilo, Zubaidah, and Ramli (2017) and Siswati and Corebima (2017) students' academic ability can be classified into upper academic ability and lower academic ability. Teachers need to pay much attention to students' academic ability, especially the students with lower academic ability because these students need special attention in their learning process. Such attention can be done by implementing effective learning models in order to improve students' academic abilities.

The use of appropriate learning models and the empowerment of students' metacognitive skills in the learning process can increase students' retention (Amin, Corebima, Zubaidah, & Mahanal, 2020; Ismirawati, Corebima, Zubaidah, & Syamsuri, 2018; Palennari, 2016). The research conducted by Ismirawati et al. (2018) suggests that implementing the ERCoRe learning model can significantly increase students' retention. Furthermore, the implementation of PBL learning models has also been shown increasing students' retention (Bahri, 2016). In addition to increasing students' retention, the implementation of other learning models has also been proven to improve students' metacognitive skills, such as Jigsaw and TPS, TEQ integrated with TPS, RQA integrated with ADI, Inquiry and PBL, and PBL integrated with Jigsaw (Atunasikha, 2010; Basith, 2011; Muhiddin, 2012; Nofitasari, 2012; Zen, 2010). Based on the facts provided in the background of this research, it is evident that there have not been many researches investigating the contribution of metacognitive skills towards the retention of students with different academic abilities. The implementation of an appropriate learning model is believed to help teachers identify the contribution of metacognitive skills towards retention in the classroom learning process. One of the learning models is the READS learning model which stands for Reading, Exploring, Answering Discussing and Summarizing. In addition to the READS learning model, the Reading, Questioning and Answering (RQA) model and Conventional learning models were also implemented in this research.

READS and RQA learning models are cooperative learning models while Conventional learning model is the learning model which is generally used by teachers in the classroom. The READS learning model is a newly developed learning model and is expected to have a positive effect and ability to reveal the contribution of metacognitive skills towards the retention of students with different academic abilities in this research.

2. RESEARCH METHODS

This research is a correlational research which aims at revealing the contribution of metacognitive skills towards the retention of students with different academic abilities for the implementation of several learning models. This research was conducted for one semester, starting from March to July in the 2017/2018 academic year. There were 206 students used as the research samples, consisting of 103 students with upper academic abilities and 103 students with lower academic abilities. The distribution of the research samples can be seen in Table 1.

Table-1. Research Samples.

No	Schools	Class	Number of Students
1	State Senior High School 1 Arjasa	Science 4 READS Model Upper	33 students
2	State Senior High School 1 Kencong	Science 4 READS Model Lower	38 students
3	State Senoir High School 4 Jember	Science 5 RQA Model Upper	33 students
4	State Senoir High School Umbulsari	Science 1 RQA Model Lower	30 students
5	State Senoir High School 1 Arjasa	Science 2 Conventional Learning Model Upper	37 students
6	State Senoir High School Balung	Science 4 Conventional Learning Model Lower	35 students

The data were collected by using a written test in the form of open-ended assessment with a total of 19 essay question items. The test was administered during the pre-test and post-test for the metacognitive skills while for the retention the test was given two weeks after the post-test in each class at the implementation of READS, RQA and Conventional learning models. The tests used for the pre-test, post-test of metacognitive skills and retention were the same. Furthermore, the research samples were selected using cluster sampling technique based on the results of the equality test. After that the hypothesis was tested using a simple linear analysis with a significance level of 5%. The data were analyzed using the SPSS 25 for Window program which was initially analyzed using the

2.1. Kolmogorov-Smirnov Test

The students' metacognitive skills were measured using a rubric developed by Corebima (2009) with a scale of 0-7, and the students' retention was measured using a rubric by Hart (1994) with a scale of 0-4. All the measurement instruments had been validated by experts and empirically validated before use. The results of the construct validation by experts show that the *essay test* for the metacognitive skills obtained an average score of 3.80 (very valid category). The instrument validity test was carried out by performing a confirmatory factor analysis and obtained a factor weighting score > 0.3 and T score of 1.96 (all items of metacognitive skills were valid). The Cronbach's Alpha coefficient on the metacognitive skills instrument shows a value of 0.959 (consistent and reliable).

3. RESEARCH RESULTS

Correlation between metacognitive skills and retention of the Upper Academic Ability Students at the Implementation of READS learning model (INI SUB JUDUL SATU).

The summary of the results of simple linear regression on the correlation between metacognitive skills and retention of upper academic ability students at the implementaiton of READS learning model can be seen in Tables 2 to 4.

Table-2. Results of ANOVA Test on the metacognitive skills and retention of the upper academic ability students at the implementation of READS learning model.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression,	409.744	1	409.744	41.434	0.000[b]
	Residual	306.561	31	9.889		
	Total	716.305	32			

Table-3. Regression Equation Coefficient Analysis between metacognitive skills and retention of upper academic ability students at the implementaiton of READS learning model.

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	30.181	4.334		6.964	0.000
	Metacognitive READS Model Upper	0.344	0.053	0.756	6.437	0.000

Table-4. Summary of regression of the Correlation between metacognitive skills and retention of the upper academic ability students at the implementation of READS learning model.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.756[a]	0.572	0.558	3.14469

The results of the analysis show that there is a significant correlation between metacognitive skills and retention of upper academic ability students at the implementation of READS learning model (Table 2). The correlation coefficient is 0.756. Thus, it can be stated that there is a significant correlation between students' metacognitive skills and retention. A summary of the regression coefficients between metacognitive skills and retention is presented in Table 3. Furthermore, Table 4 shows that the contribution value of metacognitive skills

towards the retention of upper academic ability students at the implementation of READS learning model is 57.20% with a regression line Y = 0,343x + 30,18 (Figure 1).

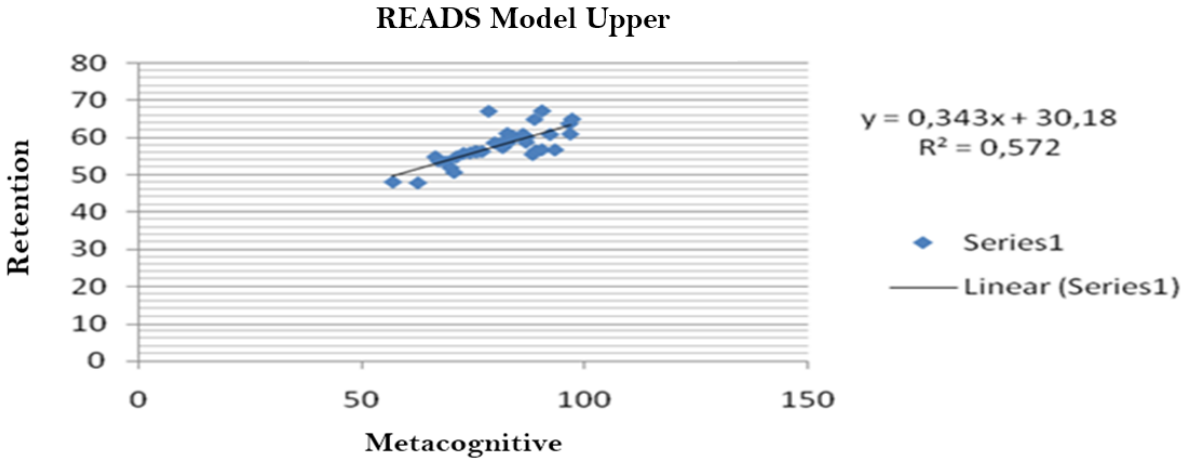

Figure-1. Graph of simple linear regression equation of metacognitive skills and retention of upper academic ability students at the implementation of READS learning model.

Correlation between metacognitive skills and retention of lower academic ability students at the implementation of READS learning model

The summary of the results of the simple linear regression of the correlation between metacognitive skills and retention of low academic ability students at the implementation of READS learning model can be seen in Tables 5 to 7.

Table-5. Results of ANOVA test on the metacognitive skills and retention of lower academic ability students at the implementation of READS learning model.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4095.617	1	4095.617	85.493	0.000[b]
	Residual	1724.617	36	47.906		
	Total	5820.234	37			

Table-6. Regression equation Coefficient Analysis between metacognitive skills and retention of the lower academic ability students at the implementation of READS learning model.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-41.157	9.833		-4.186	0.000
	Metacognitive READS Model Lower	1.147	0.124	0.839	9.246	0.000

Table-7. Summary of regression of the correlation between metacognitive skills and retention of the lower academic ability students at the implementation of READS learning model.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.839[a]	0.704	0.695	6.92142

The results of the analysis show that there is a significant correlation between metacognitive skills and retention of lower academic ability students at the implementation of READS learning model (Table 5). The correlation coefficient is 0,839. Thus, it can be stated that there is a significant correlation between students' metacognitive skills and retention. A summary of the regression coefficient between metacognitive skills and retention is presented in Table 6. Furthermore, Table 7 shows that the contribution value of metacognitive skills towards the retention of lower academic ability students at the implementation of READS learning model is 70,40% with a regression line Y = 1,147x – 41,15 (Figure 2).

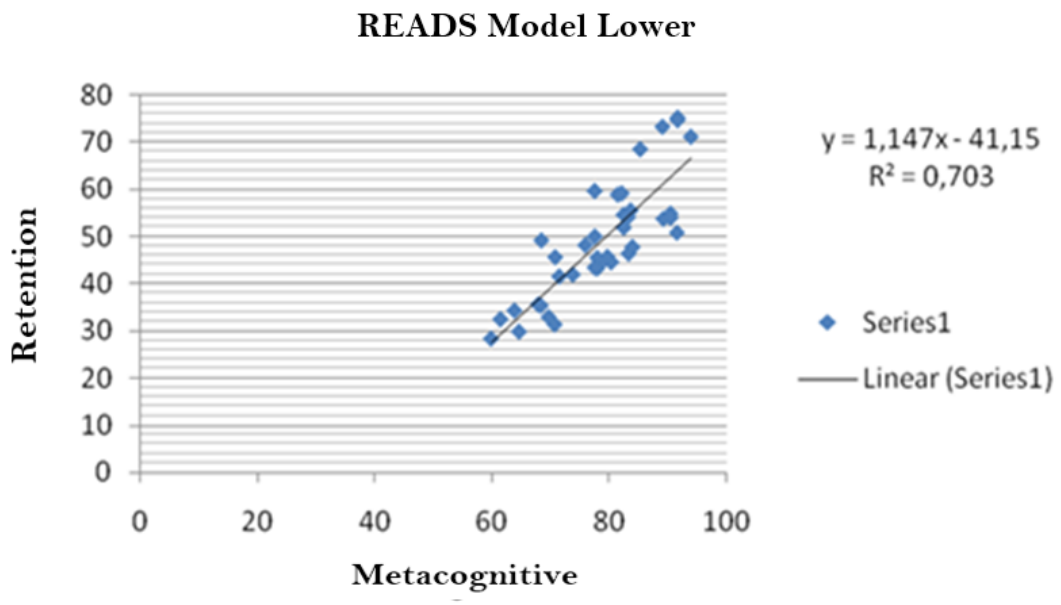

Figure-2. Graph of Simple Linear Regression Equation of Metacognitive Skills and Retention of lower academic ability students at the implementation of READS learning model.

Results of the ANOVA test on the regression equations of the correlation between metacognitive skills and retention of upper and lower academic ability students at the implementation of READS learning model.

The summary of the results of the Anova test on the regression equations of the correlation between metacognitive skills and retention of the upper and lower academic ability students at the implementation of READS learning model is presented in Table 8.

Table-8. Summary of the Anova test on the Regression Equation of the correlation between Metacognitive Skills and Retention of the Upper and Lower Academic Ability Students at the implementation of READS Learning model.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5837.761	3	1945.920	64.188	0.000[b]
	b1, b2	1059.409	1	1059.409	34.94545	0.000
	b1, b2, b3	2014.303	2	1007.151	33.22168	0.000
	Residual	2031.178	67	30.316		
	Total	7868.939	70			

The difference in the correlation between metacognitive skills and retention of the upper academic ability students and lower academic ability students after the implementation of READS learning model can be seen in Figure 3.

Regarding the READS learning model, the results of the data analysis of ANOVA test (Table 8) show that the regression lines are not parallel and coincide (intersect) with each other. The regression lines are presented in Figure 3. The figure clearly shows that the regression line of the lower academic ability students is steeper than that of the upper academic ability students.

Correlation between metacognitive skills and retention of the upper academic ability students at the Implementation of RQA learning model

The summary of the results of the simple linear regression of the correlation between metacognitive skills and retention of the upper academic ability students at the implementation of RQA learning model can be seen in Tables 9 to 11.

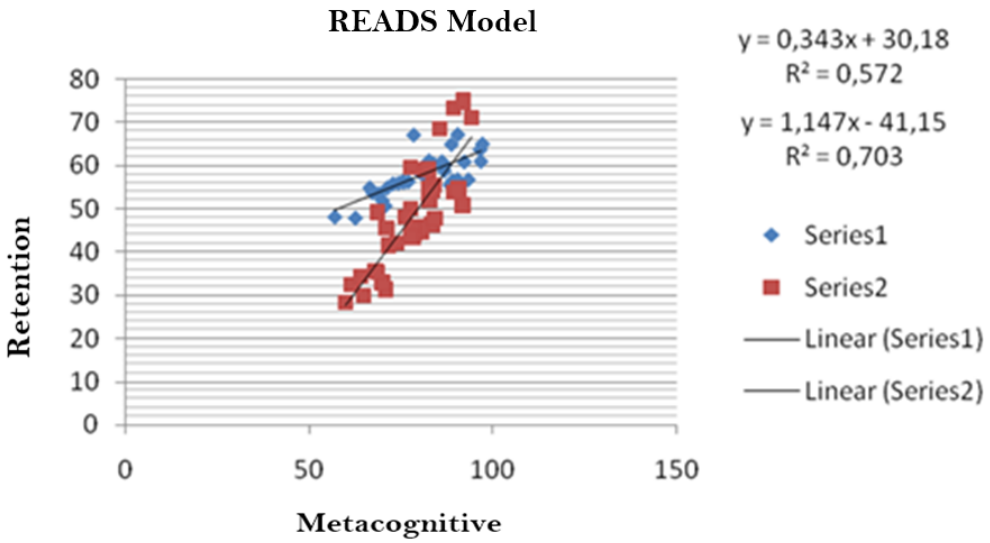

Figure-3. Graph of the Differences in Correlation between Metacognitive Skills and Retention of the Upper and Lower Academic Ability Students at the Implementation of READS Learning Model.

Table-9. The results of the ANOVA Test on the metacognitive skills and retention of the upper academic ability students at the implementation of RQA learning model.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1903.510	1	1903.510	82.011	0.000[b]
	Residual	719.527	31	23.211		
	Total	2623.037	32			

Table-10. The Regression Equation Coefficient analysis between metacognitive skills and retention of upper academic ability students at the implementation of RQA learning model.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-10.615	6.903		-1.538	0.134
	Metacognitive RQA Model Upper	0.798	0.088	0.852	9.056	0.000

Table-11. Summary of the regression of the correlation between metacognitive skills and retention of upper academic ability students at the implementation of RQA learning model.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.852[a]	0.726	0.717	4.81773

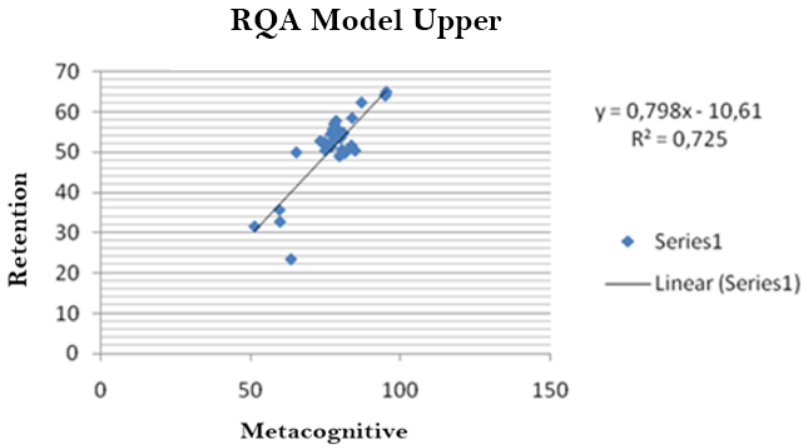

Figure-4. Graph of the Simple Linear Regression Equation of Metacognitive Skills and Retention of upper academic ability students at the implementation of RQA learning model.

The results of the analysis show that there is a significant correlation between metacognitive skills and retention of the upper academic ability students at the implementation of RQA learning model (Table 9). The correlation coefficient is 0,852. Thus, it can be stated that there is a significant correlation between students' metacognitive skills and retention. A summary of the regression coefficient between metacognitive skills and retention is presented in Table 10. Furthermore, Table 11 shows that the contribution value of metacognitive skills towards the retention of the upper academic ability students at the implementation of RQA learning model is 72,50% with a regression line Y = 0,798x – 10,61 (Figure 4).

Correlation between metacognitive skills and retention of lower academic ability students at the implementation of RQA learning model.

The summary of the results of simple linear regression of the correlation between metacognitive skills and retention of lower academic ability students at the implementation of RQA learning model can be seen in Tables 12 to 14.

Table-12. The Results of the Anova Test on the metacognitive skills and retention of the lower academic ability students at the implementation of RQA learning model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	601.467	1	601.467	46.064	0.000[b]
	Residual	365.605	28	13.057		
	Total	967.072	29			

Table-13. Regression equation Coefficient Analysis between metacognitive skills and retention of the lower academic ability students at the implementation of RQA learning model.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.567	4.819		0.740	0.465
	Metacognitive RQA Model Lower	0.474	0.070	0.789	6.787	0.000

Table-14. The summary of the regression of the correlation between metacognitive skills and retention of the lower academic ability students at the implementation of the RQA learning model.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.789[a]	0.622	0.608	3.61349

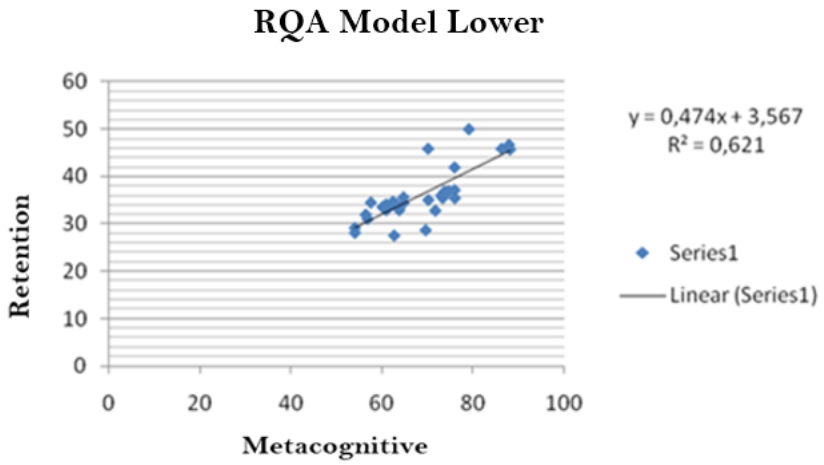

Figure-5. Graph of the Simple Linear Regression Equation of Metacognitive Skills and Retention of the lower academic ability students at the implementation of RQA learning model.

The results of the analysis show that there is a significant correlation between metacognitive skills and retention of the lower academic ability students at the implementation of RQA learning model (Table 12). The correlation coefficient is 0.789. Thus, it can be stated that there is a significant correlation between students'

metacognitive skills and retention. A summary of the regression coefficient between metacognitive skills and retention is presented in Table 13. Furthermore, Table 14 shows that the contribution value of metacognitive skills towards the retention of the lower academic ability students at the implementation of RQA learning model is 62.10% with a regression line Y = 0,474x + 3,567 (Figure 5).

ANOVA test on the regression equation of the correlation between metacognitive skills and retention of the upper and lower academic ability students at the implementaiton of RQA learning model.

The summary of the results of ANOVA on the regression equation of correlation between metacognitive skills and retention of the upper and lower academic ability students at the implementation of RQA learning model can be seen in Table 15. The difference in correlation between Metacognitive skills and retention of the upper and lower academic ability students at the implementation of RQA learning model can be seen in Figure 6.

Table-15. Summary of the Results of Anova test on the regression Equation of the correlation between Metacognitive Skills and Retention of the Upper and Lower Academic ability students at the implementation of RQA Learning model.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6265.925	3	2088.642	113.562	0.000[b]
	b1, b2	147.6447	1	147.6447	8.027632	0.006
	b1, b2, b3	1248.29	2	624.1448	33.93554	0.000
	Residual	1085.132	59	18.392		
	Total	7351.057	62			

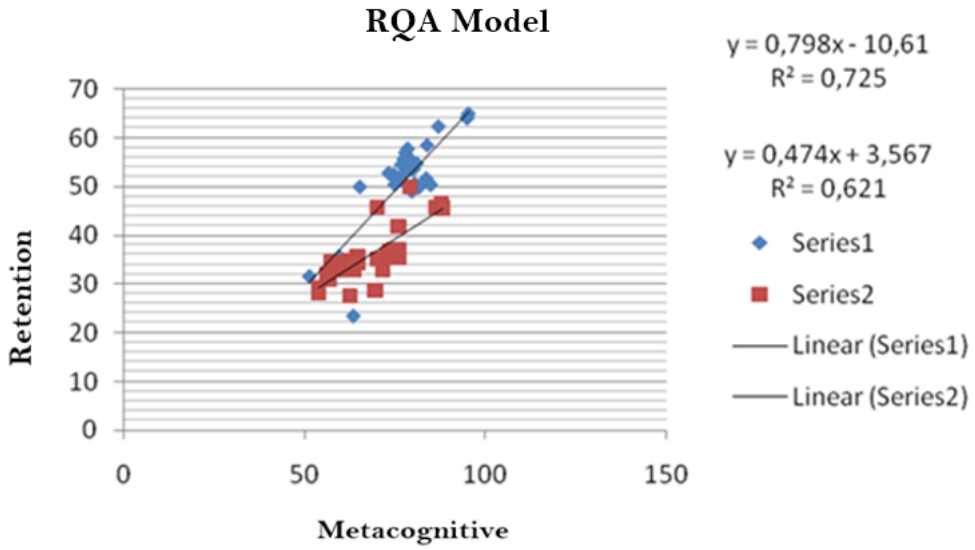

Figure-6. Graph of the Differences in the correlation between Metacognitive Skills and Retention of the Upper and Lower Academic Ability Students at the implementation of RQA Learning Model.

Related to the implementation of RQA learning model, the results of the ANOVA test Table 15 show that the regression lines are not parallel and coincide (intersect). These regression lines are illustrated in Figure 6. The figure clearly shows that the regression line of the upper academic ability students is steeper than that of the lower academic ability students.

Correlation between metacognitive skills and retention of the upper academic ability students at the implementation of the conventional learning model

The summary of the results of the simple linear regression of the correlation between metacognitive skills and retention of the upper academic ability students at the implementation of conventional learning model is presented in Tables 16 to 18.

Table-16. The Results of Anova Test on the Metacognitive Skills and Retention of the Upper academic Ability students at the implementation of the Conventional learning model.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	344.370	1	344.370	38.305	0.000[b]
	Residual	314.660	35	8.990		
	Total	659.030	36			

Table-17. The regression equation Coefficient Analysis between the metacognitive skills and retention of the upper academic ability students at the implementation of Conventional learning model.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.720	3.979		3.700	0.001
	Metacognitive Conventional Learning Upper	0.352	0.057	0.723	6.189	0.000

Table-18. The summary of regression of the correlation between metacognitive skills and retention of the upper academic ability students at the implementation of conventional learning model.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.723[a]	0.523	0.509	2.99838

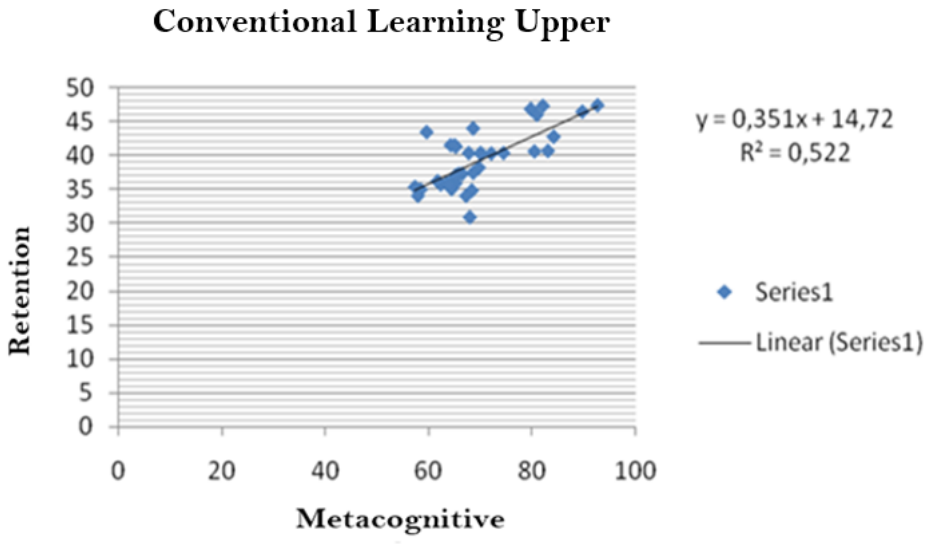

Figure-7. Graph of the Simple Linear Regression Equation of Metacognitive Skills and Retention of the Upper academic ability students at the implementation of Conventional learning model.

The results of the analysis show that there is a significant correlation between metacognitive skills and retention of the upper academic ability students at the implementation of conventional learning model (Table 16). The correlation coefficient is 0, 723. Thus, it can be stated that there is a significant correlation between students' metacognitive skills and retention. The summary of the regression coefficients between metacognitive skills on retention is presented in Table 17. Furthermore, Table 18 shows that the contribution value of metacognitive skills towards the retention of the upper academic ability students at the implementation of Conventional learning model is 52.30% with a regression line Y = 0,351x + 14,72 (Figure 7).

Correlation between metacognitive skills and retention of the lower academic ability students at the implementation of Conventional learning model.

The summary of the results of the simple linear regression of the correlation between metacognitive skills and retention of the lower academic ability students at the implementation of Conventional learning model is presented in Tables 19 to 21.

Table-19. The results of the ANOVA Tests on the Metacognitive skills and retention of the lower academic ability students at the implementation of Conventional learning model.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	373.936	1	373.936	29.778	0.000[b]
	Residual	414.390	33	12.557		
	Total	788.326	34			

Table-20. The regression equation Coefficient Analysis between the metacognitive skills and retention of the lower academic ability students at the implementation of Conventional learning model.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.466	6.294		-0.074	0.941
	Metacognitive Conventional Learning Lower	0.488	0.089	0.689	5.457	0.000

Table-21. The summary of the regression of the correlation between metacognitive skills and retention of the lower academic ability students at the implementation of Conventional learning model.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.689[a]	0.474	0.458	3.54362

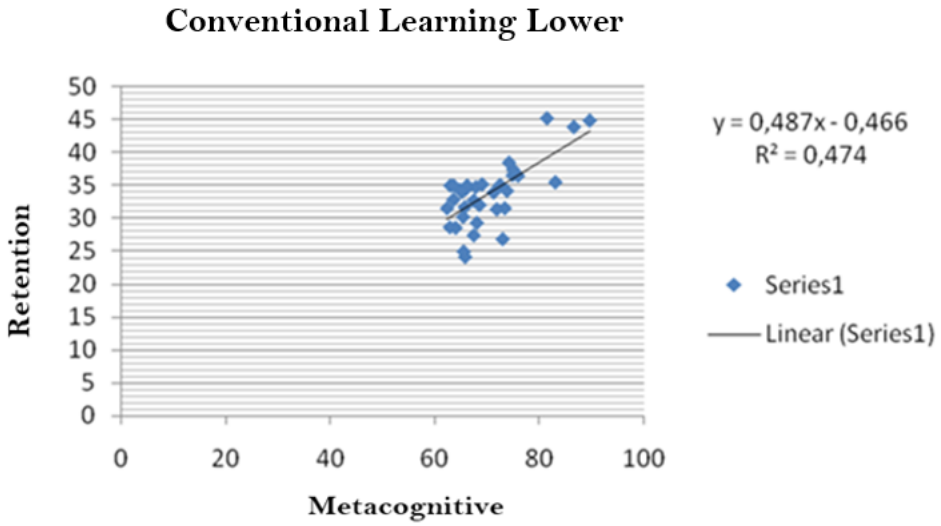

Figure-8. Graph of the Simple Linear Regression Equation between Metacognitive Skills and Retention of the lower academic ability students at the implementation of Conventional learning model.

The results of the analysis show that there is a significant correlation between metacognitive skills and retention of the lower academic ability students at the implementation of Conventional learning model (Table 19). The correlation coefficient is 0.689. Thus, it can be stated that there is a significant correlation between students' metacognitive skills and retention. The summary of the regression coefficients between metacognitive skills and retention is presented in Table 20. Furthermore, Table 21 shows that the contribution value of metacognitive skills towards the retention of the lower academic ability students at the implementation of Conventional learning is 47.40% with a regression line Y = 0,487x – 0,466 (Figure 8).

The ANOVA test on the regression equation of the correlation between metacognitive skills and retention of the upper and lower academic ability students at the implementation of Conventional learning model

The summary of the results of the Anova test on the regression equation of the correlation between metacognitive skills and retention of the upper and lower academic ability students at the implementation of Conventional learning is presented in Table 22. The differences in the correlation between metacognitive skills and retention of the upper and lower academic ability students at the implementation of Conventional learning can be seen in Figure 9.

Table-22. Summary of ANOVA test on the Regression Equation of the correlation between Metacognitive skills and Retention of the Upper and Lower Academic Ability students at the implementation of Conventional Learning model.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1248.976	3	416.325	38.832	0.000[b]
	b1, b2	18.60012	1	18.60012	1.734872	***0.192***
	b1, b2, b3	597.7368	2	298.8684	27.87609	0.000
	Residual	729.050	68	10.721		
	Total	1978.026	71			

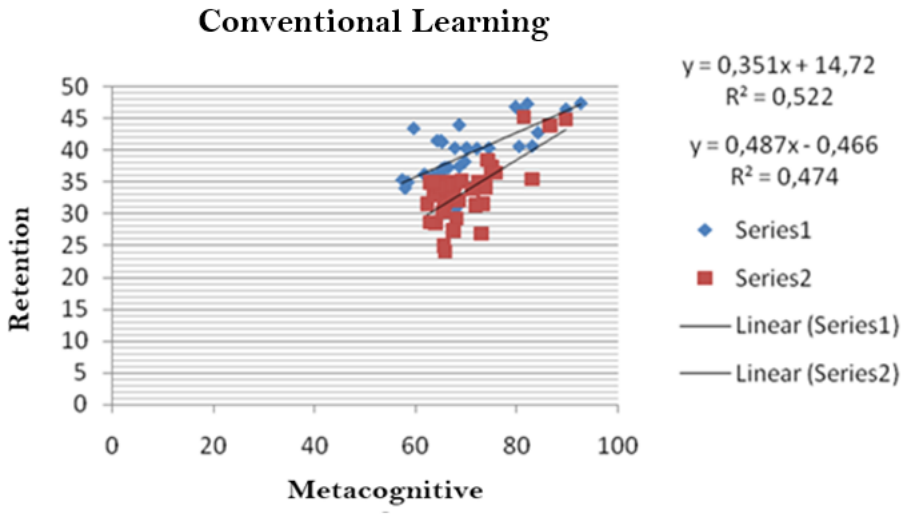

Figure-9. Graph of the Difference in the correlation between Metacognitive Skills and Retention of the Upper and Lower Academic Ability Students at the implementation of Conventional Learning model.

Related to the conventional learning, the results of the ANOVA analysis (Table 22) show that the regression lines are Not Parallel and Coincide (intersect). These regression lines are illustrated in Figure 9. The figure clearly shows that the regression line of the lower academic ability students is steeper than that of the upper academic ability students.

4. DISCUSSION

The results of the regression analysis of metacognitive skills and retention of students with upper and lower academic abilities in the READS learning model, RQA learning model and conventional learning had a significant relationship. This shows that metacognitive skills have a relationship with the retention of students with different academic abilities in the three learning models. The results of this study are in line with the results of research conducted by Muhiddin (2012); Fauziyah, Corebima, and Zubaidah (2013); Wicaksono and Corebima (2016); and Makmur, Corebima, and Gofur (2019) who reported that there was a significant relationship between metacognitive skills and retention in several different learning models.

Academic ability is a student's learning achievement including knowledge and skills. Determination of academic ability based on the results of tests of knowledge and skills possessed by students. Students' academic abilities are divided into two, namely students with upper and lower academic abilities. Furthermore, Dent and Koenka (2016); Alves, Gomes, Martins, and Almeida (2017) and Lam and Zhou (2019) stated that students with higher academic abilities have better thinking achievement than students with lower academic abilities. In line with this, Darmawan (2017) states that students with upper academic abilities have more confidence than students with lower academic abilities.

Based on the results of further analysis, it shows that the value of a positive correlation between metacognitive skills and retention of students with upper and lower abilities in the READS learning model, RQA learning model, and conventional learning. The results in this study may imply that an increase in the score of metacognitive skills is followed by an increase in the retention score of students with different abilities in the three learning models. It

can be seen that students who use metacognitive skills in the learning process will be able to plan, monitor and evaluate the learning process so that the information obtained will be more attached to their memory. This is in line with Muhiddin (2012) who states that metacognitive skills have a positive relationship with student retention. Uno (2008) states that metacognitive skills will train students in regulating and controlling what they have learned. Further Howard (2004); Nunaki, Damopolii, Kandowangko, and Nusantari (2019) and Hogan, Dwyer, Harney, Noone, and Conway (2015) stated that metacognitive skills play an important role in cognitive activities including memory and success. student learning.

A positive correlation between metacognitive skills and retention in the application of the READS learning model, students with upper academic abilities were 57.20% and lower academic abilities were 70.4% (Table 4 and 7). The RQA learning model, the value of its contribution to students with upper academic abilities is 72.60% and with lower academic abilities of 62.20% (Table 11 and 14). Conventional Learning, the contribution value of students with upper academic abilities is 52.30% and those with lower academic abilities are 47.40% (Table 18 and 21). The contribution of metacognitive skills to the retention of students with upper and lower academic abilities in the READS learning model, the RQA learning model and conventional learning shows different results. Furthermore, the size of the contribution of metacognitive skills to the retention of students with different academic abilities depends on the application of the learning model used in the classroom.

The results of this study are in line with several previous studies, but using a different learning model. Muhiddin (2012) reports that there is a correlation between metacognitive skills and student retention who uses four different learning models, namely the PBL, Jigsaw, PBLJigsaw, and Direct teaching models in the classroom, that each learning model contributes very high. However, research conducted by Fauziyah et al. (2013) reported that the contribution given by metacognitive skills and retention to the implementation of the Think Pair Share (TPS) model was moderate, as were the results of Wicaksono and Corebima (2016) research in applying the learning model. Reciprocal Teaching-Jigsaw (RT-Jigsaw) provides a metacognitive contribution and retention is also in the moderate category, and in the results of the research of Makmur et al. (2019) which implemented the PBL model, metacognitive skills contributed to low retention.

The results of the analysis of the two different regression tests of the relationship between metacognitive skills and retention of students with different abilities in the three learning models obtained intersecting lines. This means that the rate of improvement in metacognitive skills and retention of students with upper and lower academic abilities in the READS learning model, RQA learning model and conventional learning shows different rates of improvement. This is in accordance with the statements of Amin et al. (2020) and Bahri (2016) stating that each learning strategy has different potentials in empowering students' metacognitive skills.

Based on the results of the analysis of different studies, it is known that the slopes value in the application of the READS learning model shows that students with lower academic abilities are steeper than students with upper academic abilities. This means that changes in metacognitive skills and retention of students with lower academic abilities develop faster than students with upper academic abilities. The results of this study are in accordance with Hariyadi (2017) which reports that the RQA + PjBL learning model is able to tend to improve the metacognitive skills of lower-class students. Mahanal, Zubaidah, Sumiati, Sari, and Ismirawati (2019) reported that the RICOSRE model tends to improve the critical thinking skills of lower-train students. Furthermore, Akaazua, Bolaji, Kajaru, Musa, and Bala (2017), state that the application of a meaningful learning model will result in the acquisition of good knowledge understanding and retention. Siswati (2014) states that there are many factors that affect the value of slopes, including teacher behavior during the teaching and learning process, student behavior during the learning process, and the learning model applied.

READS learning model is a learning model which consists of five learning steps arranged in sequence and systematically. These learning steps are Reading, *Exploring*, Answering, Discussing, and Summarizing. Based on these learning steps, each student will have initial knowledge related to the subject matter and then this knowledge

is constructed in the learning process in the classroom to obtain new concepts that have been mutually agreed upon. Furthermore, based on the results of the research, these learning steps are able to provide a positive learning experience for students with lower academic abilities. This can be seen from students with lower academic abilities are more able to plan their learning well besides that they are also able to increase students' confidence in completing some of their learning tasks. In line with this, Damavandi, Mahyuddin, Elias, Daud, and Shabani (2011) stated that students 'abilities can be improved by creating a learning environment that is suitable for students' learning styles. Furthermore, Kapa (2001) in his research reported that metacognitive empowerment will have more effect on students with lower academic abilities than students with upper academic abilities, because students with upper academic abilities already have the ability to solve problems and tend to be more confident so they cannot maintain the achievement of results. learning but on the contrary, students with lower academic abilities tend to study more often. This is in line with research by Coutinho (2007) which states that students who empower metacognitive skills in the learning process will be more successful. Therefore, students must be able to empower their metacognitive skills in order to increase their academic achievement.

The slopes value on the application of the RQA learning model and conventional learning shows that students with upper academic abilities are steeper than students with lower academic abilities. This shows that changes in metacognitive skills and retention of students with upper academic abilities develop faster than students with lower academic abilities. In line with this, Corebima (2016) states that students with upper academic abilities from the start are already smarter than students with lower academic abilities so that students with upper academic abilities will be smarter and students with lower academic abilities cannot be equal. The results of this study are in line with the report of Siswati and Corebima (2017) which reports that the PQ4R + TPS learning model is suitable for students with upper academic abilities.

The lowest value of the relationship between metacognitive skills and retention of students with different academic abilities was found in conventional learning. This shows that conventional learning is not effective. Conventional learning is a teacher-centered learning process so that students do not get the opportunity to build their own knowledge as in the READS learning model and the RQA learning model. Furthermore, Corebima (2016) states that conventional learning is only concerned with students being able to pass the exam, so it does not pay attention to the importance of empowering students' cognitive eyes. This shows that the application of a learning model can improve metacognitive skills and retention of students with upper and lower academic abilities. This is in line with Bahri, Idris, Muis, Arifuddin, and Fikri (2021) which states that the application of learning models can increase student success and motivation in learning.

5. CONCLUSION

Based on the results of the data analysis and the discussion in this research, it can be concluded that metacognitive skills have a significant correlation with retention of the students with different academic abilities at the implementation of READS, RQA and conventional learning model. The contribution values of metacognitive skills towards retention of the upper academic ability students and the lower academic ability students at the implementation of READS, RQA, and conventional learning models are 57,20% and 70,40%, 72,60% and 62,20%, 52,30% and 47,40% respectively. The regression equation lines of the correlation between metacognitive skills and retention of the upper and lower academic ability students at the implementation of READS, RQA, and conventional learning models are intersecting. At the implementation of READS and Conventional learning models, the regression equation lines of the lower academic ability students are steeper than those of the upper academic ability students. On the other hand, at the implementation of the RQA learning model, the regression equation lines of the upper academic ability students are steeper than those of the lower academic ability students.

6. SUGGESTIONS

Based on the results of this research, it is recommended that teachers implement effective learning models to improve the metacognitive skills and retention of the upper and lower academic ability students, and more attention should be given to the upper academic ability students. One of the learning models which have been proven to have positive effects on the metacognitive skills and retention of the upper and lower academic ability students is READS learning model. nevertheless, further research needs to be conducted on different variables.

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