23 (3), 2022, 1158-1172

Jurnal Pendidikan MIPA

e-ISSN: 2550-1313 | p-ISSN: 2087-9849

http://jurnal.fkip.unila.ac.id/index.php/jpmipa/

The Effect of SQ3R Learning Model on Students' Metacognitive Ability in the Topics of Ecosystem

Tantri Rada* & Ummi Nur Afinni Dwi Jayanti

Department of Tadris Biology, Universitas Islam Negeri Sumatera Utara, Indonesia

Abstract: The low metacognitive ability of students is caused by teachers never empowering metacognitive abilities and there are still many teachers who use conventional learning approaches. The purpose of this study was to determine the effect of the SQ3R learning model on students' metacognitive abilities on ecosystem materials and to determine the differences in students' metacognitive abilities who were taught with the SQ3R learning model and conventional learning. The sample used is two classes with a total of 76 students. The research instrument consisted of a metacognitive ability test in the form of an integrated essay with learning outcomes and a metacognitive ability questionnaire which was measured using the Metacognitive Awareness Inventory Junior (MAI-Jr). The data analysis technique in this study was analyzed using ANCOVA. It was found that the influence of the SQ3R learning model on students' metacognitive abilities and the experimental class students' metacognitive abilities was better than the control class. Furthermore, there is a significant effect of the SQ3R model on students' metacognitive abilities on each indicator of metacognitive ability. So that the findings obtained can be applied by teachers in carrying out learning, especially in Biology subjects.

Keywords: ecosystem, metacognitive ability, SQ3R learning model.

Abstrak: *Rendahnya kemampuan metakognitif siswa disebabkan guru tidak pernah memberdayakan kemampuan metakognitif dan masih banyak guru yang menggunakan pendekatan pembelajaran konvensional. Tujuan penelitian ini adalah untuk mengetahui pengaruh model pembelajaran SQ3R terhadap kemampuan metakognitif siswa pada materi ekosistem dan mengetahui perbedaan kemampuan metakognitif siswa yang dibelajarkan dengan model pembelajaran SQ3R dan pembelajaran konvensional. Sampel yang digunakan yaitu dua kelas dengan jumlah 76 siswa. Instrumen penelitian terdiri dari tes kemampuan metakognitif berupa essay terintegrasi dengan hasil belajar dan angket kemampuan metakognitif yang diukur menggunakan Metacognitive Awareness Inventory Junior (MAI-Jr). Teknik analisis data dalam penelitian ini dianalisis menggunakan ANCOVA. Diperoleh adanya pengaruh model pembelajaran SQ3R terhadap kemampuan metakognitif siswa dan kemampuan metakognitif siswa kelas eksperimen lebih baik daripada kelas kontrol. Lebih lanjut, terdapat pengaruh yang signifikan model SQ3R terhadap kemampuan metakognitif siswa pada setiap indikator kemampuan metakognitif. Sehingga temuan yang diperoleh, dapat diterapkan oleh guru dalam melaksanakan pembelajaran khususnya pada mata pelajaran Biologi*

Kata kunci: *ekosistem, kemampuan metakognitif, model pembelajaran SQ3R.*

▪ INTRODUCTION

Education is a vital activity in an effort to improve human resources through the transfer of knowledge, skills, and life values to equip students towards personal maturity (Solichin, 2006). Education is an effort to prepare the nation's children towards a more prosperous, advanced and civilized nation's life that can be pursued through learning and teaching activities (Hermawan, 2014). Learning is a complex internal process, involving all mental processes that include the cognitive, affective, and psychomotor

Tantri Rada
*Email: tantri.rada@uinsu.ac.id

DOI: http://dx.doi.org/10.23960/jpmipa/v23i3.pp1158-1172
Received: 12 August 2022
Accepted: 20 September 2022
Published: 21 September 2022

domains (Nidawati, 2013). The concept of learning is essentially a change in behavior as a result of experience, experiencing something using the five senses. In other words, learning is a way of observing, reading, imitating, trying something, listening and following a certain direction (Riyanto, 2009). According to Slameto, (2003), learning is a process of effort made by a person to obtain new changes in overall behavior, as a result of his own experience in interaction with his environment. One aspect that has an important role in the success of learning is metacognitive ability (Livingston, 2003).

Cautinho (2007) explains that there is a positive relationship between learning achievement and metacognitive ability. According to Sophianingtyas & Sugiarto (2013), metacognitive abilities have an important role in regulating and controlling one's cognitive processes in learning and thinking more effectively and efficiently. Ozsoy & Ataman (2009) suggest that metacognitive abilities are awareness of the learning process, planning, strategy selection, monitoring the learning process, being able to correct their own mistakes, being able to check whether the strategies used are useful or not. With metacognitive abilities, students are able to develop themselves, motivate themselves, set goals and strive to achieve goals independently so that success in learning will be easier to achieve (Poetri et al., 2020). Schraw & Dennison (1994), suggested that metacognition has two components, namely metacognitive knowledge and metacognitive regulation. Metacognitive knowledge is divided into three types, namely declarative knowledge, procedural knowledge, and conditional knowledge. Meanwhile, metacognitive regulation has three core capabilities, namely planning, monitoring and evaluation (Rinaldi, 2017).

Pratiwi et al., (2016) reported that the low metacognitive ability of students correlated with low student learning outcomes. The low student learning outcomes because classically they have never empowered students' metacognitive abilities by teachers in class X-3 by 37.48% and are included in the risk category. This is supported by research by Wulandari & Listiana (2021) which states that students' metacognitive abilities are still low. low and can be seen from the results of the diagnostic test there are errors in the process of students' answers in metacognitive. In addition, in the research of Nurvita et al., (2019) the results of the analysis of students' metacognitive difficulties, among others, students cannot write down what is known from the problem, students cannot apply the information obtained in the concepts they have thought about, students cannot determine the initial steps they need to take. must be done in solving problems and students cannot solve problems correctly. According to Masrura (2013), students' metacognitive abilities are influenced by psychological factors including intelligence, intelligence and motivation. Meanwhile, according to In'am (2009), the factors that affect metacognitive abilities consist of the planning stage, where a teacher provides opportunities for students to find out what they will learn, the monitoring stage, the teacher provides opportunities for students to ask themselves about what that can be obtained after studying the subject matter and the evaluation process, namely how a science can be understood.

Turdjai (2014) argues that a teacher is required to be able to apply various appropriate approaches, because approaches in learning are needed to provide opportunities for students to obtain optimal learning experiences. The learning approach chosen by a teacher is expected to emphasize the process of student involvement to be able to find material and solve problems that they learn independently. Each learning

approach has certain characteristics and is straightforward and planned, namely choosing an approach that is tailored to the needs of teaching materials and is included in learning planning (Lutvaidah, 2015). The results of research by Latief et al., (2014) reported that there are still many teachers who use conventional learning approaches, the delivery of material only by lectures and student participation in learning is very less so that students tend to be passive and there is no opportunity for students to build and develop their knowledge so that students do not understand learning outcomes that they must achieve. Learning approaches that are able to facilitate the development of metacognitive abilities are emphasized on how to know (knowledge) and how they think (cognitive processes) about what students know during meaningful learning (Lestari et al., 2019)

Through metacognitive students will learn to recognize the ability to identify their own problems , learn to think about what is really the difficulty in dealing with problems. This is in line with the command of Allah SWT to muhasabah, in QS. Al Hasyr: 18.

يَا أَيُّهَا الَّذِينَ آمَنُوا اتَّقُوا اللَّهَ وَلْتَنْظُرْ نَفْسٌ مَا قَدَّمَتْ لِغَدٍ ۖ وَاتَّقُوا اللَّهَ ۚ إِنَّ اللَّهَ خَبِيرٌ بِمَا تَعْمَلُونَ

"*O you who believe! Fear Allah and let everyone pay attention to what he has done for tomorrow (the hereafter), and fear Allah. Verily, Allah is Knowing of what you do*" (QS. Al-Hasyr : 18)

Intrinsically the verse explains metacognitively, that we must think about ourselves and monitor ourselves. This verse was spoken by Ibnul Qoyyim and As-Sa'dy is the basic verse about muhasabah. Muhasabatun nafsi is someone who contemplates and looks back on what he has done to prepare for his future, so one should have time to audit himself. And this is not done once a year but must be done every day.

One of the learning models that meet the characteristics of a learning approach that can facilitate metacognitive abilities is Survey, Question, Read, Recite, Review (SQ3R). According to Budiyanto (2016), the SQ3R model is one model that can develop students' metacognition by reading the subject matter carefully and thoroughly. The SQ3R model is an efficient way to help students understand the concepts being read, is practical and can be applied in various learning approaches (Susanti, 2019). Francis P. Robinson found that students only remember half of what they have read. The use of this SQ3R model can improve understanding and long-term memory and is an excellent model to encourage students in the learning process (Jannah, 2018). Student learning outcomes using SQ3R can be more satisfying because students are actively studying the text and directly lead to the essence of a material (Rahmita & Setiawan, 2020). In addition, students must also have metacognitive awareness, so that students understand what they will do when learning. The application of this model will provide benefits for teachers and students, namely it is easier to master the class, involve students directly and be active in learning. and strengthen students' memory (Oka, 2020).

Various studies on the effect of the SQ3R learning model have actually been carried out in several schools in Indonesia. But in general, in some existing research results, the variables used by researchers such as those conducted by Fahmawati et al.,

(2017), Nurfitria (2021), Susanti (2019) and Wijayanti (2020) are learning outcomes. In addition, Rahmita & Setiawan (2020) research also found the effect of examining the influence of the SQ3R model on students' cognitive abilities. Based on this, research that examines the effect of the SQ3R learning model on students' metacognitive abilities has not been widely carried out. This study also has a difference, namely the essay test instrument for integrated metacognitive abilities with learning outcomes that can distinguish this study from other research.

The formulation of the problem in this study is whether there is an effect of the SQ3R learning model on students' metacognitive abilities and whether there are differences in students' metacognitive abilities who are taught with the SQ3R learning model and conventional learning. Based on previous research gaps, this study was conducted to answer the problem formulation of whether there is an effect of the SQ3R model on students' metacognitive abilities on ecosystem materials and whether there are differences in students' metacognitive abilities who are taught with the SQ3R learning model and conventional learning. This study is expected to provide information about how the SQ3R learning model affects students' metacognitive abilities in learning biology. In addition, the findings obtained can be used as the basis for development research carried out in biology learning and the results can also be applied by teachers in carrying out classroom learning.

▪ METHOD

The research method used in this research is quasi-experimental. This design has a control group but does not fully function to control external variables that affect experimental research results (Rukminingsih et al., 2020). The independent variable in this study is the SQ3R learning model and the dependent variable is metacognitive ability. The research design used is the Pretest Posttest Control Group Design. In this design, the experimental group and the control group were selected randomly. Both groups were given a pretest to determine the initial state to see the difference between the experimental class and the control class.

Participants

This research was conducted in one of the Madrasah Aliyah in Batu Bara Regency. This research was carried out in May until completion. The population in this study were students of class X which consisted of 3 classes, with a total of 116 people. In this study, the samples used were class X IPA 1 and class X IPA 2. The sampling technique in this study was the Cluster Random Sampling technique, which is a sampling technique whose selection refers to groups not individuals. According to Margono (2004), the Cluster Random Sampling is used when the population does not consist of individuals, but consists of groups of individuals or clusters.

Instruments

The instrument of this study used a metacognitive ability instrument consisting of a metacognitive ability test in the form of an integrated essay with student learning outcomes and a metacognitive ability questionnaire measured using the Metacognitive Awareness Inventory. Junior (MAI-Jr) which was adapted by Sperling et al., (2002) which has been standardized consists of 18 items. In addition, there are additional items in the Schraw & Dennison (1994) questionnaire totaling 2 items covering aspects

ofmetacognitive knowledgewith sub-aspects of declarative knowledge, procedural knowledge, and conditional knowledge, and aspects of meta cognitive regulation with aspects of planning, information management strategies, comprehension monitoring, debugging strategies, and evaluation. There are 4 alternative choices used by MAI-Jr, namely always, often, rarely and never, with a score of 4, 3, 2, and 1. So the score for this variable is the sum of all items. This inventory of metacognitive abilities (MAI-Jr) has been standardized, so in this case the validation test is no longer used by experts or limited trials (try outs) in the field but can be used directly to measure students' metacognitive abilities (Arifin & Saenab, 2014). It's just that validation is done to linguists to translate English into Indonesian, to make it easier for students to fill out questionnaires.

Procedure

This research procedure consists of research steps and learning steps. The steps in the research consist of the research preparation stage, namely literature study, instrument design and research instrument validation. In addition, a survey of school conditions, research permits, discussions with biology teachers in the class concerned were carried out to obtain information about the characteristics of students in the class, discuss the schedule of research implementation and class management which will be carried out by researchers. Then, the research implementation stage is determining the sample class, collecting data before learning (pretest), learning stage (Student Worksheet) in the experimental class, and collecting data after learning (posttest). The next stage is the reporting stage, at this stage data processing and data analysis are carried out. After that, the stage of working on the results and discussion and drawing conclusions from the data is carried out.

Meanwhile, the learning steps consist of five stages according to the syntax of the SQ3R learning model, namely survey, question, read, recite, and review and are related to indicators of metacognitive ability, including: Declarative knowledge (declarative knowledge) is knowledge about himself as a learner and about what factors affect their learning performance (knowing "about" things), Procedural knowledge (procedural knowledge), namely knowledge about how to use strategies (knowing "how" do things), Conditional knowledge (conditional knowledge), namely knowledge about when and why using strategies or knowing when and why to use declarative knowledge and procedural knowledge (knowing the "why" and "when"), Planning refers to choosing the right strategy and providing sources that affect achievement, Information management strategies show how good k and the sequence of strategies that students use to process information efficiently, Comprehension monitoring (supervision) refers to a person's awareness of understanding and the results of the task, Debugging strategies (improvement) shows how well students assess learning and strategies students use to correct misunderstandings and performance learning and evaluation (evaluation) refers to the assessment of learning outcomes and effectiveness.

Table 1. Syntax and developed metacognitive indicators

Syntax	Indicators	Learning Activities
Survey	• *Declarative knowledge* • *Planning*	Students conduct a review through information obtained from reading books takes 5-10 minutes

Syntax	Indicators	Learning Activities
Question	• *Declarative knowledge* • *Procedural knowledge* • *Conditional knowledge*	Students analyze the material and make questions related to the material being
Read	• *Procedural knowledge* • *Conditional knowledge* • *Information management strategies*	Students read actively to find answers to questions that have been prepared
Recite	• *Declarative knowledge* • *Information management strategies* • *Debugging strategies*	Students mention answers to prepared questions
Review	• *Comprehension monitoring* • *Debugging strategies* • *Evaluation*	Students review all questions and answers briefly

The data analysis technique in this study was analyzed using Analysis of Covariance (ANCOVA). ANCOVA was chosen as a data analysis technique in this study because it is in accordance with the purpose of ANCOVA, namely to determine or see the effect of treatment on the response variable by controlling other quantitative variables. The ANCOVA prerequisite test in this study was to use the normality test and homogeneity test (Payadnya & Jayantika, 2018). The ANCOVA test was carried out with the help of the SPSS version 22 application for windows.

▪ RESULT AND DISSCUSSION

This research produces quantitative data. The data obtained by using integrated essay questions on learning outcomes and metacognitive ability questionnaires Metacognitive Awareness Inventory Junior (MAI-Jr). The increase in students' metacognitive abilities was obtained from the difference between the pretest and posttest in the learning activities of each class. The maximum value used to assess students' metacognitive abilities is 100. Based on the results of descriptive analysis, in the experimental class the average (mean) pretest is 45.64 with a standard deviation of 10.6 while the posttest average value (mean) for the experimental class is 87.62 with a standard deviation of 4.06. In the control class the mean (mean) of the pretest was 44.86 with a standard deviation of 10.7, while the mean (mean) of the posttest was 55.08 with a standard deviation of 11.9. The data on the graphs of the pretest and posttest show that the students' metacognitive ability before and after carrying out the learning process using the SQ3R learning model is higher in the experimental class compared to the control class.

To find out whether the SQ3R learning model is effective or not on the pretest and posttest that have been given, the normalized n-gain test is carried out. The results of the n-gain test are presented in Figure 1.

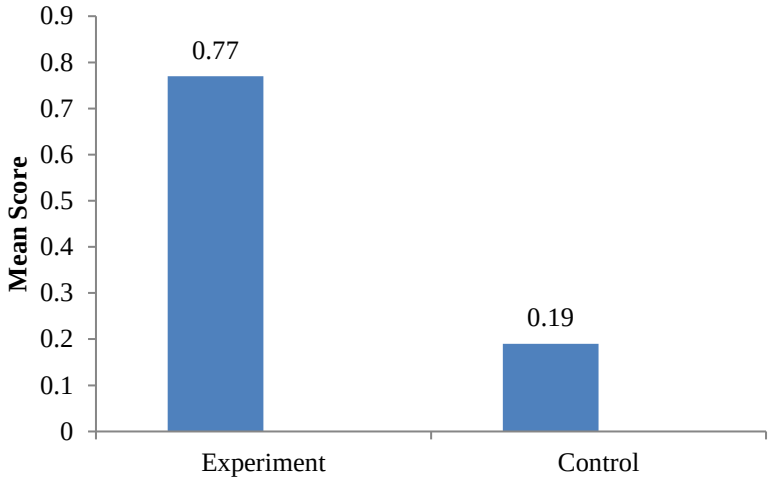

Figure 1. Average n-gain of learning outcomes integrated metacognitive ability essay

Based on Figure 1 above, the average value of n-gain is normalized. In the experimental class, the n-gain score was 0.77. Based on the gain, it can be concluded that the data is in the high category, namely n-gain > 0.7 with a percentage of % i.e. > 76 is in the effective category. Meanwhile, the control class got an n-gain score of 0.19. Based on the normalized gain criteria, it can be concluded that the data is in the low category, namely n-gain < 0.3 with a percentage < 40% which is in the ineffective category. In addition to measuring metacognitive ability using an integrated essay test of learning outcomes, metacognitive ability is also measured through the Metacognitive Awareness Inventory Junior (MAI-Jr) instrument. Further analysis was carried out on indicators of metacognitive ability which include declarative knowledge, procedural knowledge, conditional knowledge, planning, information management strategies, comprehension monitoring, debugging strategies and evaluation which are presented in Figure 2.

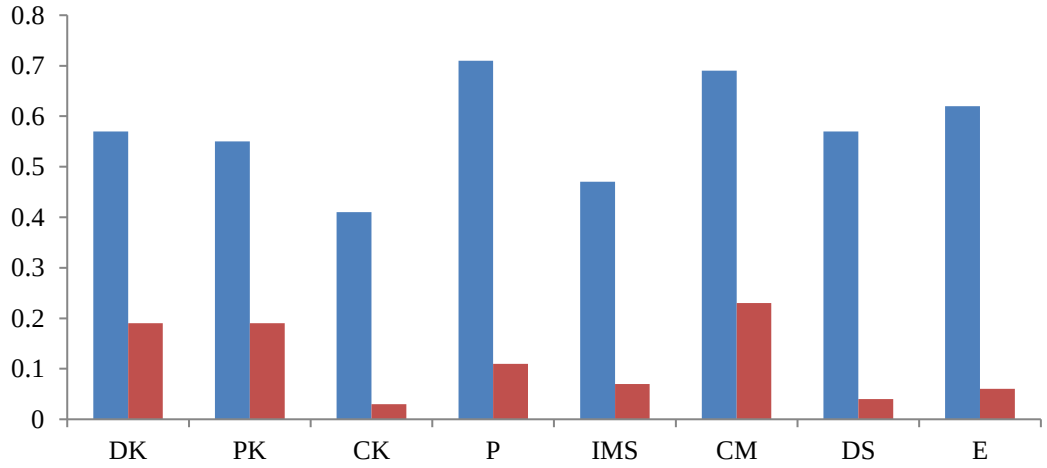

Figure 2. N-gain score of each indicator of metacognitive ability between experiment class (blue) and control class (red)

Based on Figure 2 above, it provides an overview of the n-gain values for the experimental class and the control class obtained from the *Metacognitive Awareness Inventory Junior* (MAI-Jr) questionnaire data taught with the SQ3R learning model and the conventional model. It is known that in the experimental class taught with the SQ3R learning model, the *planning indicator (p)* is in the high category, namely n-gain > 0.7, the *Declarative Knowledge (DK) Indicator, Procedural Knowledge (PK), Conditional Knowledge (CK), Information Management Strategies (IMS), Comprehension Monitoring (CM), Debugging Strategies (DS),* and *Evaluation (E)* were in the moderate category, namely $0.3 \leq g \leq 0.7$.

Meanwhile, in the control class taught using conventional learning models, indicators of *Declarative Knowledge (DK) Indicator, Procedural Knowledge (PK), Conditional Knowledge (CK), Information Management Strategies (IMS), Comprehension Monitoring (CM), Debugging Strategies (DS), and Evaluation (E)* are in the low category, namely n-gain < 0.3. It is known that for each indicator of metacognitive ability, the highest increase occurred in the experimental class. In the experimental class, the increase in the results of the pretest and posttest occurred significantly compared to the increase in students' metacognitive abilities in the control class. Before conducting the ANCOVA test, a prerequisite test was first carried out. In the prerequisite test using normality test and homogeneity test. The normality test was conducted to determine whether the samples taken in the study were normally distributed or not. The data tested are experimental class data and control class data. The results of the normality test can be seen in Table 2.

Tabel 2. Test of normality

Tests of Normality

		Kolmogorov-Smirnov[a]		
	Kelas	Statistic	df	Sig.
Hasil Kemampuan Metakognitif	Pretest Eksperimen	.121	39	.159
	Posttest Eksperimen	.120	39	.164
	Pretest Kontrol	.116	37	.200*
	Posttest Kontrol	.092	37	.200*

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Based on the data obtained in Table 2 using the Kolmogorov-Smirnov test, the sig value is obtained for pretest of the experimental group is 0.159 (sig. > 0.05), and the posttest data in the experimental class obtained sig. 0.164 (sig. > 0.05). While in the control class for pretest, it was obtained that sig. 0.200 (sig. > 0.05) and posttest data sig. 0.200 (sig. > 0.05). Therefore, it can be concluded that all data are normally distributed. After doing the normality test, the next step is to do the homogeneity test. The homogeneity test is carried out with the aim of showing that two or more groups of sample data that have been taken come from populations that have the same variance. Homogeneity test can be seen in Table 3. Sig value is 0.474 that showed the homogeneous variance of the data.

Tabel 3. Test of homogeneity

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Hasil Kemampuan Metakognitif	Based on Mean	.519	1	74	.474
	Based on Median	.373	1	74	.543
	Based on Median and with adjusted df	.373	1	74.000	.543
	Based on trimmed mean	.506	1	74	.479

After the prerequisite test in the form of normality test and homogeneity test, it can be continued with the ANCOVA test. In analyzing the data, this study used the ANCOVA test because there were two classes being compared, namely the experimental class and the control class and using test instruments in the form of pretest and posttest in each class. So that the ANCOVA test is feasible to calculate the required data analysis. To find out the results of the ANCOVA test can be seen in Table 4.

Table 4. ANCOVA test

Tests of Between-Subjects Effects

Dependent Variable: Nilai Posttest

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	22434.831[a]	2	11217.415	240.960	.000	.868
Intercept	8879.933	1	8879.933	190.749	.000	.723
Pretest	2337.621	1	2337.621	50.214	.000	.408
Kelompok	19570.223	1	19570.223	420.386	.000	.852
Error	3398.367	73	46.553			
Total	417373.000	76				
Corrected Total	25833.197	75				

a. R Squared = .868 (Adjusted R Squared = .865)

Based on Table 4, it can be seen that the significance number for the pretest variable is 0.000. If the value of Sig. < 0.05 then H_1 is accepted. Because 0.000 < 0.05, it can be concluded that there is a difference between the pretest and posttest. Based on Table 8, it can be seen that the significance number for the group variable is 0.000. If the value of Sig. < 0.05 then H_1 is accepted. Because 0.000 < 0.05, it can be concluded that there is a difference between the treatment given to the posttest. Therefore, it can be concluded that there is an effect of the SQ3R model on students' metacognitive abilities. Based on Figure 2, in the experimental class the increase in the results of the pretest and posttest occurred significantly compared to the increase in students' metacognitive abilities in the control class. These results can be caused by several things including differences in thinking skills, intelligence, social status, environment and student

learning motivation (Andriyani, 2015). This is in line with previous research by Hasanah et al., (2013) that the metacognitive ability of experimental class students who were taught with the SQ3R learning model increased, while the control class only slightly increased metacognitive abilities from the initial assessment before learning and after learning. In addition, metacognitive ability and learning outcomes have a positive relationship or correlation with high interpretation or in this case metacognitive awareness is very influential on student learning outcomes. Increased metacognitive awareness of a student will help student learning outcomes become better.

The learning syntax carried out at the time of the SQ3R learning model research consisted of 5 stages, namely the *survey, question, read, recite, and review*. The stages in the SQ3R model can facilitate indicators that exist in metacognitive ability variables, including *declarative knowledge*, *procedural knowledge*, *conditional knowledge*, *planning*, *information management strategies*, *comprehension monitoring*, *debugging strategies* and *evaluation*. First, at the ***survey***, the teacher acts as a giver of instructions about the steps that students must take. The purpose of the survey is for students to know the length of the text, sub-chapters, new terms and so on. That way students will be trained to run indicators in metacognitive abilities, namely *declarative knowledge* and *planning*. Next is the ***question***, where students compile a list of questions that are relevant to the text they read. The teacher provides instructions or examples to students on how to formulate clear, concise and relevant questions. The number of questions is predetermined, depending on the length of the text and the number of concepts studied. At this stage students are able to develop indicators of metacognitive ability, namely *declarative knowledge*, *procedural knowledge* and *conditional knowledge*.

Next is the ***read***, at this stage the teacher asks students to actively read and look for answers to the questions that have been prepared. In this case, active reading also means reading that is focused on paragraphs that are considered relevant to the questions that have been prepared previously. At this stage the students can develop indicators of metacognitive abilities, namely *procedural knowledge*, *conditional knowledge* and *information management strategies*. At the ***recite***, the teacher asks students to discuss the answers to the questions that have been compiled in groups. On this occasion students are trained to answer questions without opening books or notes that have been made. And so on so that all questions can be answered. At this stage students can develop indicators of metacognitive abilities, namely *declarative knowledge*, *information management strategies* and *debugging strategies*. Finally, at the ***review***, the teacher asks each group to present the results of the group discussion along with the answers to the questions in the student worksheets (LKPD) in class. At this stage, indicators of metacognitive abilities that can be developed are *comprehension monitoring*, *debugging strategies* and *evaluation*.

Learning with the SQ3R model will make learning active, because students are directly involved in learning, without just waiting for the information provided by the teacher, and will trigger students' curiosity in the learning process, this will be very helpful in improving students' metacognitive abilities. The above is in line with the opinion of Utami (2012), the use of the SQ3R learning model in the learning process, can build a learning atmosphere that does not make students bored and is not passive in carrying out the learning process, thus students can gain skills, skills and attitudes born from experience. and interactions with the environment from their learning outcomes.

From a theoretical point of view, metacognitive abilities are related to learning outcomes. This is in line with the research of Arifin et al., (2012), Fauziyah et al., (2012), Apriani (2014), and Andriyani (2015), where metacognitive abilities affect learning outcomes respectively by 31.9%, 32 .5%, 14.4% and 4.64% Rahman & Philips (2006), explained that their research shows that metacognitive ability has a significant positive relationship to student achievement. This opinion is in line with metacognitive theory which discusses the relationship between metacognition and student learning outcomes, among others: Flavell (1979) formulated that metacognition plays an important role in the learning process. In addition, there are also opinions from other studies such as the opinion of Nuryana & Sugiarto (2012) which states that there is a significant relationship between metacognitive ability and learning outcomes. The higher the students' metacognitive ability, the higher the student's learning outcomes, and vice versa, the lower the students' metacognitive abilities, the lower the student's learning outcomes.

The SQ3R model used in this study has characteristics, including (a) students play an active role in learning, (b) teachers as facilitators and active monitors, (c) learning is formed in small groups and teachers as mentors, (d) students faced with a phenomenon and then asked to conduct a survey first (Selmedani, Septiana, & Lasari, 2021). According to Ilmi et al., (2018), the advantages of the SQ3R model are (1) providing a broader understanding of the subject matter contained in textbooks, (2) making students more active, (3) making direct focus on the essence or main content. implied and explicit material. in the text. So that it does not rule out the possibility of achieving an effective learning process in accordance with the expected goals. In addition, according to Effendi (2013), metacognitive ability has an important role in the learning process, metacognitive is useful for student academic achievement and is one way to understand differences in student academic achievement.

▪ CONCLUSION

Based on the results of research and data analysis conducted, there is a significant effect of the SQ3R model on students' metacognitive abilities. Thus the researchers concluded that 1) there was an effect of the SQ3R learning model on students' metacognitive abilities 2) the experimental class students' metacognitive abilities were better than the control class. This study has limitations on the scope of time during the study and students are not accustomed to using the SQ3R learning model in learning. In the use of the SQ3R learning model, timeliness in every run of the existing syntax is very concerned because of the limited time, so it is hoped that further research can consider and make good use of time according to the scope of the material to be studied and further researchers can use different materials, especially in the eye Biology.

▪ REFERENCES

Andriyani, H. (2015). Hubungan antara kesadaran metakognisi dengan hasil belajar mahasiswa baru jurusan pendidikan MIPA FKIP Universitas Mataram [The relationship between metacognitive awareness and learning outcomes of new students majoring in Mathematics and Natural Sciences, Faculty of Education, Mataram University]. Thesis, Universitas Mataram.

Apriani, N. M. W. (2014). Korelasi antara keterampilan metakognitif dengan hasil belajar IPA siswa kelas vii SMPN 1 Kuripan tahun ajaran 2013/2014 [Correlation between metacognitive skills and science learning outcomes for seventh grade students of SMPN 1 Kuripan in the 2013/2014 academic year]. Thesis, Mataram University.

Arifin, A. N., & Saenab, S. (2014). Perbandingan kesadaran metakognitif siswa yang diajar menggunakan model Problem-Based Instruction (PBI) dengan kooperatif tipe Think Pair Share (TPS) [Comparison of metacognitive awareness of students who are taught using the Problem-Based Instruction (PBI) model with Think Pair Share (TPS) cooperative types]. Bionature, 15(2), 81–89.

Arifin, M.S., Siti, Z., dan Susriyati, M. (2012). Hubungan antara keterampilan metakognitif terhadap hasil belajar biologi dan retensi siswa kelas x dengan strategi reciprocal teaching di SMA Negeri 1 Lawang [The relationship between metacognitive skills on biology learning outcomes and retention of class x students with reciprocal teaching strategies at SMA Negeri 1 Lawang]. Thesis, State University of Malang.

Budiyanto, M. A. K. (2016). Sintaks 45 model pembelajaran dalam Student Centered Learning (CTL) [Syntax 45 learning models in Student Centered Learning (CTL)]. Malang: University of Muhammadiyah Malang.

Cautinho, A. S. (2007). The relationship between goals, metacognition, and academic success. Educate, 7(1), 39–47.

Effendi, N. (2013). Pengaruh Pembelajaran Reciprocal Teaching dipadukan Think Pair Share terhadap peningkatan kesadaran metakognisi belajar biologi siswa SMA berkemampuan akademik berbeda di kabupaten Sidoarjo [Effect of Reciprocal Teaching Learning combined with Think Pair Share on increasing awareness of metacognition learning biology for high school students with different academic abilities in Sidoarjo district]. Journal of Education Santiaji, 3(3), 85-109.

Fahmawati, F., & Komala, R. (2017). Pengaruh model pembelajaran Survey, Question, Read, Recite, Review (SQ3R) dan kemampuan berpikir kritis terhadap hasil belajar peserta didik SMA [The effect of the Survey, Question, Read, Recite, Review (SQ3R) learning model and critical thinking skills on the learning outcomes of high school students]. BIOEDUCATION: Journal of Biology Education, 10(2), 55–62.

Fauziyah, D.R., Aloysius D, C., dan Siti, Z. (2012). Hubungan keterampilan metakognisi terhadap hasil belajar biologi dan retensi siswa kelas x dengan penerapan strategi pembelajaran Think Pair Share di SMAN 6 Malang [The relationship of metacognition skills to biology learning outcomes and retention of class x students with the application of the Think Pair Share learning strategy at SMAN 6 Malang]. Thesis, State University of Malang.

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of american psychologist.

Hasanah, M., Abdullah., & Sugianto. (2013). Pengaruh model pembelajaran Survey, Question, Read, Recite, Review (SQ3R) dan learning strategy terhadap kesadaran metakognisi dan hasil belajar kognitif pada materi pengaruh kepadatan populasi manusia terhadap lingkungan [The effect of Survey, Question, Read, Recite, Review (SQ3R) and learning strategy learning models on metacognitive

awareness and cognitive learning outcomes on the effect of human population density on the environment]. Journal of Educational Biology, 5(2), 48–53.

Hermawan, A. (2014). Konsep belajar dan pembelajaran menurut Al-Ghazali [The concept of learning and learning according to Al-Ghazali]. Qathruna's Journal, 1(1), 84–98.

Ilmi, D. N., Hermawan, R., & Riyadi, A. R. (2018). Metode pembelajaran SQ3R untuk meningkatkan kemampuan membaca pemahaman [SQ3R learning method to improve reading comprehension kemampuan]. Journal of Elementary School Teacher Education, 2(4), 88–99.

In'am, A. (2009). Peningkatan kualitas pembelajaran melalui lesson study berbasis metakognisi [Improving the quality of learning through metacognition-based lesson study]. Educational Journal, 12(1), 125–135.

Jannah, M. (2018). The effect of Survey, Question, Read, Recite, and Review (SQ3R): method and learning motivation of achievement in learning indonesian language. International Research Journal of Engineering, IT & Scientific Research, 4(1), 1–11.

Latief, H., Rohmat, D., & Ningrum, E. (2014). Pengaruh pembelajaran kontekstual terhadap hasil belajar (studi eksperimen pada mata pelajaran geografi kelas VII di SMPN 4 Padalarang) [The effect of contextual learning on learning outcomes (experimental study on geography class VII at SMPN 4 Padalarang)]. Journal of Gea, 14(2), 14–28.

Lestari, W., Selvia, F., & Layliyyah, R. (2019). Pendekatan open-ended terhadap kemampuan metakognitif siswa [An open-ended approach to students' metacognitive abilities]. At-Ta'lim: Journal of Education, 5(2), 93-106.

Livingston, J. A. (2003). Metacognition: An overview. Eric clearinghouse on assesment and evaluation. College Park Maryland.

Lutvaidah, U. (2016). Pengaruh metode dan pendekatan pembelajaran terhadap penguasaan konsep matematika [The effect of learning methods and approaches on mastery of mathematical concepts]. Formative: Scientific Journal of Mathematics and Natural Sciences, 5(3), 279–285.

Margono. (2004). Metodologi penelitian pendidikan [Educational research methodology]. Jakarta: Rineka Cipta.

Masrura, S. I. (2003). Faktor-faktor psikologis yang mempengaruhi kesadaran metakognisi dan kaitannya dengan prestasi belajar matematika [Psychological factors that affect metacognitive awareness and its relation to mathematics learning achievement]. Journal of Mathematics and Learning (MAPAN), 1(1), 1–19.

Nidawati. (2013). Belajar dalam perspektif psikologi dan agama [Study in psychology and religion perspective]. Pioneer Journal. 1(1), 13–28.

Nurfitria. (2021). Implementasi metode pembelajaran SQ3R (Survey, Question, Read, Recite, Review) dalam upaya meningkatkan hasil belajar biologi materi pokok sistem pencernaan makanan kelas XI SMAN 1 Sungai Lala [Implementation of the SQ3R learning method (Survey, Question, Read, Recite, Review) in an effort to improve learning outcomes of biology, the subject matter of the digestive system, class XI SMAN 1 Sungai Lala]. Tambusai Education Journal, 5(3), 5933–5940.

Nurvita., Sinaga, B., & Mukhtar. (2019). Analisis kesulitan metakognisi dan koneksi matematis siswa dengan menggunakan model pembelajaran kooperatif tipe Jigsaw di SMP N 1 Lawe Bulan Aceh Tenggara [Analysis of students' metacognition difficulties and mathematical connections using the Jigsaw type cooperative learning model at SMP N 1 Lawe Bulan Aceh Tenggara]. Paradikma Journal of Mathematics Education, 12(1), 20-25.

Nuryana, E., & Sugiarto, B. (2012). Hubungan keterampilan metakognisi dengan hasil belajar siswa pada materi reaksi reduksi oksidasi (redoks) kelas X-1 SMA Negeri 3 Sidoarjo [The relationship between metacognition skills and student learning outcomes in the material of oxidation reduction reactions (redox) class X-1 SMA Negeri 3 Sidoarjo]. UNESA Journal of Chemical Education, 1(2), 83–91.

Oka, I. B. (2020). Penggunaan model pembelajaran SQ3R (Survey, Question, Read, Recite, Review) sebagai upaya meningkatkan prestasi belajar bahasa inggris [The use of the SQ3R learning model (Survey, Question, Read, Recite, Review) as an effort to improve english learning achievement]. Journal of Education Research, 4(3), 256–263.

Ozsoy, G., & Ataman, A. (2009). An investigation of the relationship between metacognition and mathematics achievement. International Electronic Journal of Elementary Education, 12(2), 227–235.

Payadnya, I. P. A. A., & Jayantika, I. G. A. N. T. (2018). Panduan penelitian eksperimen beserta analisis statistik dengan spss [Experimental research guide along with statistical analysis with spss]. Yogyakarta: Deepublish.

Poetri, D. A., & Nugroho, E. D., & Vlorensius. (2020). Hubungan antara kecerdasan emosional dan keterampilan metakognitif terhadap hasil belajar siswa kelas VII SMP Negeri Di Kabupaten Nunukan [The relationship between emotional intelligence and metacognitive skills on the learning outcomes of seventh grade students of State Junior High School in Nunukan Regency]. Borneo Journal of Biology Education, 2(1), 7–15.

Pratiwi, I., Suratno, S., & Iqbal, M. (2016). Peningkatan kemampuan metakognisi dan hasil belajar siswa dengan pendekatan keterampilan proses melalui Think Pair Share pada siswa kelas X-3 SMAN Yosowilangun Lumajang tahun 2014/2015 [Improving students' metacognitive abilities and learning outcomes with a process skills approach through Think Pair Share in class X-3 students at SMA Yosowilangun Lumajang in 2014/2015]. UNEJ Educational Journal, 3(2), 22-28.

Rahman, S., & Philips, J. A. (2006). Hubungan antara kecerdasan metakognisi, motivasi dan pencapaian hasil akademik pelajar universiti [The relationship between metacognitive intelligence, motivation and academic achievement of university students]. Educational Journal, 31, 21–39.

Rahmita, R., & Setiawan, Y. (2020). Pengaruh SQ3R (Survey, Question, Read, Recite, Review) terhadap kemampuan kognitif siswa SMP di kota Sukabumi [The effect of SQ3R (Survey, Question, Read, Recite, Review) on the cognitive abilities of junior high school students in the city of Sukabumi]. Report of Biological Education, 1(1), 21–29.

Rinaldi. (2017). Kesadaran metakognitif [Metacognitive awareness]. UNP RAP Journal, 8(1), 79–87.

Riyanto, Y. (2009). Paradigma baru pembelajaran, sebagai referensi bagi pendidik dalam implementasi pembelajaran yang efektif dan berkualitas [A new paradigm of learning, as a reference for educators in implementing effective and quality learning]. Jakarta: Kencana.

Rukminingsih, Adnan, G., & Latief, M. A. (2020). Metode penelitian pendidikan [Educational research methods]. Yogyakarta: Erhaka Utama.

Schraw, G., & Dennison, R. S. (1994). Assesing metacognitive awareness. Contemporary Educational Psychology, 19(4), 460–475.

Selmedani, S., Septiana, V. W., & Lasari, Y. L. (2021). Penggunaan model SQ3R untuk meningkatan hasil belajar membaca pemahaman pada peserta didik kelas IV SD [The use of the SQ3R model to improve reading comprehension learning outcomes for fourth grade elementary school students]. Journal of Community Studies and Development, 4(1), 55–66.

Slameto. (2003). Belajar dan faktor-faktor yang mempengaruhinya [Learning and the factors that influence it]. Jakarta: Rineka Cipta.

Solichin, M. M. (2006). Belajar dan mengajar dalam pandangan Al-Ghazali [Learning and teaching in the view of Al-Ghazali]. Tadris, 1(2), 138-139.

Sophianingtyas, F., & Sugiarto, B. (2013). Identifikasi level metakognitif dalam memecahkan masalah materi perhitungan kimia [Identify the metacognitive level in solving chemical calculation problems]. UNESA Journal of Chemical Education, 2(1), 21–27.

Sperling, R. A., Howard, B. C., Miller, L. A., & Murphy, C. (2002). Measures of childrens's knowledge and regulation. Contemporary Educational Psychology, 27(1), 51–79.

Susanti, Y. (2019). Implementasi metode pembelajaran SQ3R dalam upaya meningkatkan hasil belajar biologi materi pokok sistem pencernaan makanan kelas X di SMK Negeri 2 Banjarmasin [Implementation of the SQ3R learning method in an effort to improve biology learning outcomes, the subject matter of the food digestive system for class X at SMA Negeri 2 Banjarmasin]. Journal of Biological Education, 5(2), 59-71.

Turdjai. (2014). Pengaruh pendekatan pembelajaran terhadap hasil belajar mahasiswa [The effect of the learning approach on student learning outcomes]. Triadic, 15(2), 17–29.

Utami, S. (2012). The Influence of Survey Question Read Recite And Review (SQ3R) learning method on the students' achievement in ecosystem concept of the seventh grade at MTS Negeri Pamarican Ciamis regency. Educational Journal.

Wijayanti, T. S. (2020). Penerapan metode SQ3R dalam meningkatkan hasil belajar biologi [Application of the SQ3R method in improving biology learning outcomes]. JISIP (Journal of Social Sciences and Education), 4(4), 224–230.

Wulandari, & Listiana, Y. (2021). Analisis kemampuan metakognisi siswa dalam pemecahan masalah matematik pada pembelajaran berbasis masalah [Analysis of students' metacognitive abilities in solving mathematical problems in problem-based learning]. Journal of Math Education Nusantara, 4(1), 38–51.