Analysis of Metacognitive Awareness, Learning Methods, and Learning Outcomes in Biology of Student

Dian Intan Rahmadhni[1*], Moralita Chatri[1]

[1] Master of Biological Education, Padang State University, Padang, Indonesia.

Abstract: This study aimed to determine the relationship between metacognition awareness, learning methods and learning outcomes in biology based on the academic abilities of students in class X MIPA at SMA Negeri Bangkinang city for the Academic Year 2022/2023. This research was conducted on January 9 - January 17, 2023. This research was a correlational study and data collection used questionnaires, documentation and interviews. The sample in this study were 218 students with different levels of academic ability. Data analysis in this study used the Person Product Moment correlation analysis technique. The results showed that at high academic levels, metacognition awareness (X1), learning methods (X2) and learning outcomes (Y) had a moderate relationship (0.418). In low academic metacognition awareness (X1), learning methods (X2) and learning outcomes (Y) there is a moderate relationship (0.447). For significant test scores obtained at high academic, metacognition awareness (X1), ways of learning (X2) and learning outcomes (Y) t-test (4.75) > t-table (1.98). At low academic levels, metacognition awareness (X1), learning methods (X2) and learning outcomes (Y) t-test (5.16) > t-table (1.98). The results showed that there was a significant relationship between metagonistic awareness, ways of learning and learning outcomes in biology based on the academic abilities of class X students at SMA Negeri Bangkinang city.

Keywords: Biology learning; Learning methods; Metacognitivec awareness

Introduction

Education is a process in which students will continue and until students reach a mature person. This process takes place within a certain period of time. If students have reached adulthood, students will be fully capable of acting independently for the welfare of life and society. This means that education is an obligation for every human being, especially for immature students. Most of the developmental processes that take place through learning activities, in education the efforts made to change one's behavior are called the learning process (Hasbullah, 2006).

Education is a process of influencing students to be able to adapt as well as possible to the surrounding environment, thereby causing changes in themselves that enable them to function well in social life. According to Slameto (2013), learning is a process of effort by a person to obtain a new change in behavior as a whole, as a result of his own experience in interaction with his environment.

According to Trianto (2009), the learning process is essentially a conscious effort from a teacher to teach his students to achieve the expected goals. In essence, a teacher must be able to create dynamic conditions in order to continue to improve the quality of learning. A teacher is also responsible for fostering students in solving the problems they face everyday, so that students are able to be independent by using facts, concepts, principles, and theories obtained in class.

Learning success apart from being determined by learning factors is also determined by the selection of strategies used in learning. According to Slameto (2013) the selection of strategies in learning is important to improve the quality of the learning process. One aspect that has an important role in solving learning problems is metacognition. Suratno (2010) states that metacognition is very necessary in solving learning

problems, metacognitive abilities and abilities in higher order thinking are basic potentials that need to be developed in these students.

Learning patterns that are oriented towards cognitive learning outcomes of students are still the main concern of education experts in measuring the quantity and quality of students' learning processes. This can be seen from the implementation of learning so far, which is related to the strategies and methods used and other technical implementations that do not show any aspects of empowering thinking.

Learning outcomes are abilities possessed by students after receiving learning (Sudjana, 2014). The success of the learning process is generally seen from the learning outcomes achieved by students, the problem that is often encountered in the learning process is the low learning outcomes obtained by students. High or low student learning outcomes can be influenced by several factors, namely internal factors and external factors.

Empowerment of metacognition in students can be done by teaching students to use metacognition strategies. Metacognitive strategies are sequential processes that help a person to control cognitive activity and to ensure that cognitive goals have been achieved (Amnah, 2014). Metacognitive strategies as a way to increase awareness of the prevailing thinking and learning processes so that when this awareness is realized, one can control his thoughts by designing, monitoring and assessing what he learns.

Internal factors that influence learning outcomes other than metacognition are the way students learn. When in the process of change there will be problems that often arise and must receive attention, namely the problem of how students learn. Given that the success of achieving learning goals is also determined by the learning method factors of the students, applying good learning methods will lead to success in learning and conversely applying poor learning methods will lead to less success in learning.

According to Rohmawati et al. (2012) how to learn is a way or strategy of students in carrying out learning activities to achieve good learning outcomes and what they expect. In learning methods, of course, there are good or bad ways of learning, this is in line with what Slameto (2013) said, namely regarding standards for good learning methods, namely making schedules and implementing them, repeating lesson material, reading and making notes, concentrate and do the job.

School is an institution that provides instruction to students. This teaching institution provides formal teaching. Unlike the case with families and communities that provide education informally. In general, school is a place for teaching and learning (Hamalik, 2013).

Many students fail or do not get good learning outcomes because they do not know or do not have effective ways of learning and most of the students try to memorize the lesson and do not understand the content of what they have learned. It can be concluded that if students do not have a good way of learning, students will get low learning outcomes and can cause a decrease in the quality of education.

The results of interviews and observations with biology teachers at Bangkinang High School that this school was classified as a favorite high school, because many students were interested in wanting to enter this school. This is due to the many achievements that have been achieved such as quizzes and the Olympics. However, the researcher found several problems from students regarding biology learning, namely that there were still many students who had low scores. Many student scores are still below the passing grade (75). Problems in this case are found in almost every class. Moreover, in class X the teacher often uses scientific terms so that it is difficult to understand for students who have low learning abilities.

Metacognitive Awareness

According to Livingstone in Matulessy (2012), defines metacognition as Thinking about thinking or thinking about thinking. Metacognition according to the character is the ability to think where the object of thinking is thinking that happens to oneself. Metacognition plays an important role in problem solving. According to Garner and Karmiloff-Smith, as their opinion was quoted by Lee and Bergin in Matulessy (2012) metacognition is an important dimension of problem solving because this ability includes awareness of problems relevant to thought, monitoring of cognitive processes and implementing appropriate strategies.

Metacognition in learning is an important concept in cognition theory. Metacognition is not the same as cognition, for example the skills to read a text are different from the skills to understand the text. Metacognition has advantages where a person tries to contemplate how to think or contemplate the cognitive processes he is doing. Metacognition is simply defined as "rethinking what has been thought", and there are even experts who link metacognition with control or information processing functions. Although the definitions are different, in general metacognition is a person's awareness or knowledge of the processes and results of his cognition and his ability to control and evaluate these cognitive processes.

The level of metacognition is the level of one's awareness of the processes and results of thinking. The level of metacognition proposed by Fitriani (2013) is divided into four, namely: (a) Tacit use: Is the level of

students solving problems by trial and error or origin answers in solving problems in learning, so that students do not show metacognition awareness and are not aware of conceptual errors with the results obtained. (b) Aware use: It is the level of students having the ability to make decisions that have a basis, students are aware of their weaknesses and students know things that are not known. (c) Strategy use: At this level students are able to realize what students are doing. Then able to give good arguments to support the results of thinking and students are able to use strategies that raise awareness in the process of solving problems in questions. (d) Reflective use: At this level students can solve problems well, can master learning material, and can evaluate the results of their work.

Learning Method

How to learn is a way or strategy that is applied by students as a learning effort in order to achieve the desired results (Rohmawati et al., 2012). Good or bad assessment of the effort made will be reflected in the form of student learning achievement. Good learning outcomes will be influenced by good learning methods and bad learning outcomes will be influenced by learning methods as well. The way of learning for each student varies according to the thinking ability of each student. According to Rohmawati et al. (2012) learning method is one of the internal factors that influence student learning outcomes. How to learn is the way or strategy of students in carrying out learning activities to achieve the expected learning outcomes. In the way of learning certainly has ways that are good or not.

How to learn is a way for students to carry out activities in increasing their knowledge and experience. In achieving good learning outcomes, good learning methods are also needed, in fact there are still many students who have bad or not good learning methods. This can be seen from both the learning activities in class and at home, for example by being given homework (PR) there are still students who don't do it so students have to make fun of it at school, then it can be seen that during tests there are still students who try to cheat.

Learning and learning methods have factors that can affect the process of learning, learning as a process or activity that is carried out by many things or factors. These factors can come from within and outside the learner. According to Dalyono (2005) the factors that determine the achievement of learning outcomes are: (a) Internal factors (health, interest and motivation, how to learn). (b) External factors (family, school, surrounding environment)

Learning Outcomes

According to Sanjaya in Chania et al. (2017) learning outcomes are the ability of students to fulfill a stage of achieving learning experience in one basic competency in learning, to achieve the expected learning outcomes the teacher should design varied, interesting and meaningful learning scenarios according to all types of learning diverse learners.

According to Bloom (Suprijono, 2009) the definition of learning outcomes includes cognitive, affective, and psychomotor abilities. Cognitive domains are knowledge (knowledge, memory), comprehension (understanding, explaining, summarizing, examples), application (applying), analysis (describing, determining relationships), synthesis (organizing, planning, forming new buildings), and evaluation (assessing).

Method

This type of research is descriptive research, descriptive research is research that describes a symptom, fact, event and events that are or have occurred (Lufri, 2007). This study used a proportional random sampling technique. According to Sugiyono (2016) this technique is used if the population has members or elements that are not homogeneous and proportionally stratified.
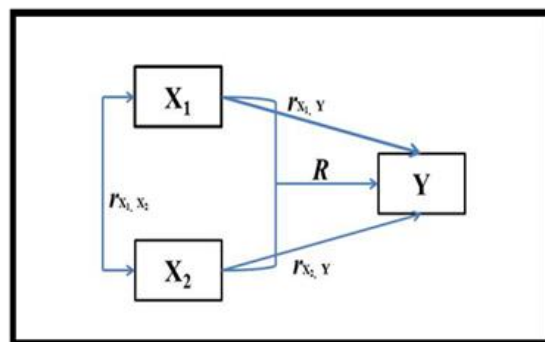

Figure 1. Research design

Result and Discussion

Based on the results of the research conducted on class X students at SMA Negeri Bangkinang Kota, the achievement data was obtained in metacognition awareness and students' learning methods. Data were obtained through metacognition awareness questionnaires and questionnaires on how to learn and the learning outcomes of students obtained through the learning values given by the teacher.

Metacognitive Awareness Data

Data from students' metacognition awareness research were obtained by distributing questionnaires to class X MIPA students who were used as research samples. The questionnaire given to students contains question items arranged based on indicators of

metacognitive awareness. The results obtained from the calculation of each statement based on each sub-indicator are then calculated by the average value and interpreted by 5 categories. The division of these categories includes BB (Not Developed), MSB (Still Very Risky), BBB (Not Very Developed), MB (Starting to Develop), SBB/OK (Already Developing Well), SUPER (Developing Very Good), for more details results of recapitulation of all indicators of metacognitive awareness based on the level of academic ability of class X MIPA students at SMA Negeri Bangkinang city.

Table 1. Recapitulation of All Sub-Indicators of Metacognitive Awareness Based on the Level of Academic Ability of Class X MIPA Students at SMA

| Indicator | Sub Indicator | High | | Low | |
		N	K	N	K
Understanding of metacognition	Procedural understanding	169	S	127	OK
	Declarative understanding	168	S	119	MB
	Conditional understanding	170	S	135	OK
Regulation of metacognition	Information management strategy	169	S	138	OK
	Planning	172	S	153	OK
	Monitoring comprehensive strategy	174	S	144	OK
		174	S	142	OK
	evaluation	170	S	137	OK
Average of sub indicator		171	S	137	OK

Based on Table 1 it shows that high academic students get an average of 171 which is included in the super category and low academic students get an average of 137 which is included in OK.

Students with High Academic Ability

Based on the results of the data analysis of the metacognitive awareness questionnaire of high academic students, the value of each sub-indicator was obtained which illustrates that high academic students have entered the existing category.

Table 2. Recapitulation of Metacognitive Awareness Sub-Indicators of Class X High Academic Students at SMA

Indicator	Sub Indicator	Score	Category
Understanding of metacognition	Procedural understanding	169	Super
	Declarative understanding	168	Super
	Conditional understanding	170	Super
	Information management strategy	169	Super
Regualation of metacognition	Planning	172	Super
	monitoring comprehensive	174	Super
	strategy	174	Super
	evaluation	170	Super
Average of sub indicator		171	Super

Based on table 2, it shows that overall the average number of all indicators of metacognitive awareness of

students with high academic abilities is 171, which is included in the super category. All sub-indicators of metacognitive awareness in high academic students fall into the super category, namely planning and comprehensive monitoring, which have the highest score of 174, while the lowest score is the procedural knowledge sub-indicator of 169.

Students with Low Academic Ability

Based on the results of the analysis of the low academic students' metacognition awareness questionnaire data, the scores obtained from each sub-indicator illustrate that low academic students fall into the existing category.

Table 3. Sub-Indicators of Metacognitive Awareness Recapitulation of Class X Low Academic Students at SMA

Indicator	Sub Indicator	Score	Category
Understanding of metacognition	Procedural understanding	127	OK
	Declarative understanding	119	DEVELOPING
	Conditional understanding	135	OK
	Information management strategy	138	OK
Regulation of metacognition	planning	153	OK
	monitoring comprehensive	144	OK
	strategy	142	OK
	evaluation	137	OK
Average of Sub Indicator		137	OK

Table 3 shows that the total average number of sub-indicators of metacognitive awareness of students with low academic abilities is 137 which are included in the OK category. All sub-indicators of metacognitive awareness in low academic participants included in the OK category, namely planning, had the highest score of 153, while the MB category, namely declarative knowledge, had the lowest score of 119.

Learning Method Data

Data on student learning methods was obtained from a questionnaire with 4 alternative answers, namely: SL (Always), SR (Often), KD (Sometimes) and TP (Never). The questionnaire has a score of each value for a positive (+) item statement with an answer always will get a value of 4 and never will get a value of 1, while a negative statement (-) with an answer will always get a value of 1 and never will get a value of 4.

The questionnaire given to students contained statement items that had been prepared based on indicators. The results obtained from each calculation of

positive and negative statement items based on each sub-indicator are then calculated on average with 4 categories. For more details, it can be seen from the recapitulation of all indicators of how students learn based on the level of academic ability of class X MIPA students at SMA Negeri Bangkinang city.

Table 4. Recapitulation of All Sub-Indicators of Learning Methods Based on the Level of Academic Ability of Class XI MIPA Students at SMA

Indicator	High		Low	
	%	K	%	K
Creating schedule and implementation	81.2	Very Good	51.4	Moderate
Creating books	79.1	Good	74.4	Good
Creating notes	82.5	Very Good	64.1	Good
Following the lesson	85	Very Good	66.8	Good
Restudy the lesson	89.4	Very Good	73.6	Good
Concentrating	87.7	Very Good	78.4	Good
Memorizing	79.5	Good	75	Good
Exam	75.6	Good	71.2	Good
Average of indicator	82.5	Very Good	69.4	Good

Based on table 4, it shows that students who have high academics get an overall average of 82.5 in the very good category of learning indicators, while students with low academics get an overall average of 69.4 in the good category.

Students with High Academic Ability

Based on the results of data analysis on the high academic student learning method questionnaire, the percentage of each indicator that illustrates that high academic students are included in the existing category is obtained.

Table 5. Recapitulation of Learning Method Indicators for Students with High Academic Ability Class X at SMA

Indicator	Percentage (%)	Category
Creating schedule and implementation	81.2	Very good
Creating books	79.1	Good
Creating notes	82.5	Very good
Following the lesson	85	Very good
Restudy the lesson	89.4	Very good
Concentrating	87.7	Very good
Memorizing	79.5	Good
Exam	75.6	Good
Average of indicator	82.5	Very good

Based on Table 5 it shows that overall the average number of all indicators of how to learn biology for students with academic ability is 82.5% which is in the very good category. All indicators of learning methods for high academic students are included in the very good category with a high percentage, namely the repeating

lesson indicator has a percentage of 89.4%, while the lowest percentage is the exam taking indicator of 75.6%.

Students with Low Academic Ability

Based on the results of data analysis on the low academic learning method questionnaire, the percentage of indicators that illustrate that low academic students are included in the existing category is obtained.

Table 6. Recapitulation of Learning Method Indicators for Students with Low Academic Ability Class X at SMA

Indicator	Percentage (%)	Category
Creating schedule and implementation	51.4	Adequate
Creating books	74.4	Good
Creating notes	64.1	Good
Following the lesson	66.8	Good
Restudy the lesson	73.6	Good
Concentrating	78.4	Good
Memorizing	75	Good
Exam	71.2	Good
Average of indicator	69.4	Good

Based on Table 6 shows that overall the average number of all indicators of learning methods of students with low academic ability is 69.4% which is in the good category. For low academic students, two different categories were obtained, namely good and sufficient, for indicators of concentration included in the good category with a percentage of 78.4%, while making schedules and implementation were included in the sufficient category with a percentage of 51.4%.

Student Result Data

Learning outcomes are results achieved by a person after carrying out learning activities and assessments that have been achieved by students to find out the extent to which learning materials have been taught and received by students. Dimyati et al. (2013) suggest that learning outcomes are the results obtained from the interaction of learning and teaching. The act of teaching carried out by the teacher ends with the process of evaluating learning outcomes, while the learning outcomes of students are the process of learning. To determine the level of success achieved by students marked with a scale in the form of letters or words. In this study, researchers took the mid semester scores. As a benchmark used in studying learning outcomes is based on passing grade according to Arikunto which has been explained in chapter 3.

Table 7 shows that the number of students in the high category is 109 students with a percentage of 50%, and in the low category there are 109 students with a percentage of 50%. In the above description it can be seen regarding the acquisition of the percentage of

metacognition awareness, learning methods and learning outcomes of students, it can be seen in general the comparison of the three variables based on the level of academic ability with Table 8.

Table 7. Learning Outcomes of Class X MIPA Students at SMA

Result	Interval	Frequency	Percentage (%)
High	81 – 100	109	50%
Medium	61 – 80	0	0
Low	41 – 60	109	50%
Poor	21 – 40	0	0
Very poor	< 21	0	0
Total		218	100

Table 8. Acquired Percentage of X1, X2 and Y Scores Based on Academic Ability Level

Variable	High	Low
metacognition awareness (X1)	171	137
Learning method (X2)	82.5%	69.4%
Learning outcome (Y)	50%	50%

Correlation Analysis

Table 9. Results of Student Correlation Analysis Based on Academic Ability

Correlation between variables	Academic ability			
	High		Low	
	r_{test}	r_{tabel}	r_{test}	r_{tabel}
Metacognition awareness (X1) with learning outcome (Y)	0.361	0.20-0.399 (medium)	0.354	0.20-0.399 (medium)
Learning method (X2) with learning outcome (Y)	0.308		0.358	
Metacognition awareness (X1) and learning method (X2) with learning outcome (Y)	0.418	0.30-0.499 (strong)	0.447	0.30-0.499 (strong)

Correlation analysis was used to determine whether there was a relationship between metacognition awareness (X1), learning methods (X2) and student learning outcomes (Y), in this study using the Pearson product Moment formula. After getting the results of the correlation analysis, it will be compared with the interpretation of the correlation coefficient. The results of the calculation have been carried out with a correlation number of metacognition awareness (X1), learning method (X2) and student learning outcomes (Y) at a high academic level of 0.418, based on the correlation coefficient interval, the calculation is included in the strong category (Appendix 23), and while for the correlation number of metacognition awareness (X1), learning method (X2) and student learning outcomes (Y)

at a low academic level of 0.447 based on the correlation coefficient interval, the calculation is included in the low category.

Significance Test

This significant test was carried out to find out whether there is a significant relationship between metacognitive awareness (X1) and learning outcomes (Y), learning methods (X2) and learning outcomes (Y), metacognitive awareness (X1), learning methods (X2) and learning outcomes (Y) students based on the level of academic ability. The results of the analysis of significant test data can be seen in Table 10.

Table 10. Significant Test Results for Higher Academic Student

Variable	t_{test}	t_{able}	Category
Variable X1 with Y	3.99		$t_{test} > t_{able}$, hipotesis
Variable X2 with Y	3.34	1.98	accepted
Variable X1, X2 and Y	4.75		(Ho rejected, Ha accepted)

Based on Table 10, it shows that metacognitive awareness (X1) and learning outcomes (Y) have Ttest (3.99) > t-table (1.98). Learning methods (X2) with learning outcomes (Y) are known t-test (3.34) > ttable (1.98). Whereas metacognition awareness (X1), learning method (X2) and learning outcomes (Y) have t-count (4.75) > t-table (1.98), then Ho is rejected and Ha is accepted. There is a significant relationship between metacognition awareness and learning outcomes, learning methods and learning outcomes, as well as metacognition awareness, learning methods and learning outcomes of class X students at SMA Bangkinang city.

Table 11. Significance Test Results for Low Academic Students

Variable	t_{test}	t_{able}	Category
Variable X1 with Y	3.91		$T_{test} > t_{tabel}$, hypothesis
Variable X2 with Y	3.96	1.98	accepted
Variable X1, X2 and Y	5.16		(Ho rejected, Ha accepted)

Based on Table 11, it shows that metacognitive awareness (X1) and learning outcomes (Y) have tcount (3.91) > ttable (1.98). How to learn (X2) with learning outcomes (Y) known Ttest (3.96) > ttable (1.98). Whereas metacognition awareness (X1), learning method (X2) and learning outcomes (Y) have Ttest (5.16) > ttable (1.98), then Ho is rejected and Ha is accepted. There is a significant relationship between metacognition awareness and learning outcomes, learning methods and learning outcomes, as well as metacognition awareness, learning methods and learning outcomes of class X students at SMA Bangkinang city.

Discussion

This research was to find out the relationship between metagonistic awareness, ways of learning, and learning outcomes in biology X at SMA Negeri Bangkinang city in the 2022/2023 academic year. This research was conducted using a research instrument in the form of a questionnaire using a measuring scale in the form of a Likert scale to measure students' attitudes, opinions and perceptions. In this study, measuring metacognitive awareness has 2 main indicators and 3 sub-indicators for metacognitive knowledge and 5 sub-indicators for cognition regulation, while learning methods have 8 indicators to measure learning methods.

Metacognitive Awareness
Relationship between Metacognition Awareness and Learning Outcomes

Metacognition is a relationship with students' way of thinking about themselves and the ability to use certain learning strategies appropriately (Nur, 2011). According to Flavell (1979) metacognition includes everything related to cognition. Metacognitive awareness can lead students to recognize their own way of thinking so that students do not only memorize concepts and principles in learning and can understand them correctly. There are 2 main indicators for measuring metacognitive awareness, namely metacognitive knowledge with sub-indicators: a) procedural knowledge, b) declarative knowledge, c) conditional knowledge. Meanwhile, indicators of cognition regulation with sub-indicators: a) management strategy, b) planning, c) comprehensive monitoring, d) strategy, e) evaluation.

Higher Academic Students

Based on the results of the analysis of metacognitive awareness questionnaire data for high academic students, it shows that there are no high academic students who are in the BB, MSB, BBB, MB category, but are included in the SUPER category with the overall result of the metacognitive awareness sub-indicator score of 171 which is included in super category. According to Yustina et al. (2012) the success of students in learning is influenced by their metacognitive abilities. If each learning activity is carried out with reference to indicators from learning how to learn, optimal results will definitely be easily achieved. According to Amnah (2014) there are no more students who have not used metacognition in learning and have no awareness that thinking is a process. Students who are in the category have used metacognitive awareness regularly to regulate the process of thinking and learning independently. Furthermore, according to Yowono (2014) through metacognition students are able to become independent learners, cultivate an honest attitude, dare to admit mistakes and can improve learning outcomes significantly.

For high academic participants, it shows that the indicator of cognition regulation on the strategy sub-indicator with a value of (174) is included in the SUPER category. One is shown in statement number 44 which has the highest score on the sub-indicator, namely "I ask myself whether what I am reading is related to what I already know" as many as 71 students (65.1%) gave very frequent responses. Based on the results of the questionnaire, students have entered the strategic use level, at this level students are able to realize what is being done. Students are also able to provide good arguments to support the results of their thinking, and students are able to use strategies that raise awareness in the process of solving problems in questions and what students are reading.

The lowest sub-indicator is declarative knowledge which has a value of 168 which is included in the super category. One of them is shown in statement number 32 "I made another example myself to make information (knowledge) more meaningful" which had the highest score of 67 students (61.5%). Based on the results of the questionnaire students gave responses by making their own examples of information (knowledge), students could find out more about the information (knowledge) they got and students could apply the information (knowledge) in learning either at school or at home. Furthermore, additional information obtained by researchers through interviews conducted with teachers, it can be seen that students who have high academic ability must have a high willingness to learn. So that activities such as reading make them happy, apart from that the activeness in the teaching and learning process is very large. Being able to easily understand the explanation of the material conveyed by the teacher and students being able to organize themselves in learning will easily achieve goals and have their own satisfaction in achieving the learning they want.

Based on the results of the correlation test between metacognition awareness and biology learning outcomes, it shows that high academic students have a significant relationship with an r-count of 0.361 which is in the low category with a contribution of 13%. Metacognition awareness is able to influence learning outcomes, because the presence of students who are able to use metacognition will affect the mindset that is becoming increasingly developed. Developing students' metacognition is able to generate effectiveness in processing the information received, so that students can more easily understand the learning process. In line with the opinion of Monawati (2015) that the intelligence factor is one of the factors that determine learning

achievement. Smart students will be successful in learning activities, because it is easier to capture and understand the lessons and easier to remember them. This reference illustrates that high academic students have better metacognitive awareness, because they can control cognitive processes and have awareness in motivating the learning activities carried out. Students who have been able to use metacognitive tend to be more successful with metacognitive learners can better manage their cognitive activities (Amnah, 2014).

Low Academic Students

Based on the results of the analysis of the low academic students' metacognition awareness questionnaire data, it shows that there are no low academic students who are in the BB, MSB, BBB and SUPER categories but fall into two categories, namely MB declarative knowledge, while OK on procedural knowledge, conditional knowledge, management information strategy, planning, comprehensive monitoring, strategy, evaluation. The overall value obtained from the sub-indicator of metacognitive awareness is 137, which is in the OK category. According to Yustina et al. (2012) the success of students in learning is influenced by their metacognitive abilities. If each learning activity is carried out with reference to indicators from learning how to learn, optimal results will definitely be easily achieved. Furthermore, according to Yowono (2014) through metacognition students are able to become independent learners, cultivate an honest attitude, and dare to admit mistakes and can improve learning outcomes significantly.

For low academic participants, the highest sub-indicator is planning with a value of (153) which is in the OK category. One is shown in statement number 8 "I set goals in doing assignments" with as many as 51 students (46.8). Because students, by setting goals in doing assignments, will do more assignments. However, some of the students copied what their friends had done. Students who have a plan in learning eat easily set goals, activate resources and choose the right strategy in a task.

The lowest sub-indicator is declarative knowledge with a value of 119 which is included in the MB category. One is shown in statement number 46 "I manage time to achieve goals well" with as many as 45 students (41.3). Students argue that they are starting to set their schedule in learning, so that students are not far behind and it is not difficult to understand the lessons given by the teacher. If learning according to students is difficult, then students begin to arrange schedules to repeat and read books about material that students consider rather difficult to understand, and students can discuss with friends about the material.

Based on the results of the correlation test between metacognition awareness and biology learning outcomes, it shows that low academic students have a significant relationship with an r-test of 0.354 which is included in the low category with a contribution of 12.5%. This is because the learning outcomes of students are not only influenced by the metacognitive awareness factor but many other influencing factors, one of which is family and environmental factors.

From the results of the study, it was found that students' metacognition awareness is basically a method or learning strategy that is applied as a learning effort in order to achieve the desired learning outcomes. This cannot be separated from the ability of students to process good metacognition awareness which will make it easier for students to learn. The realization of students' metacognitive awareness must be encouraged by the teacher. Assessment of the good and bad ways of learning or strategies applied by students will be seen from the learning outcomes obtained by these students. So that good learning outcomes are also influenced by good learning methods as well as metacognition awareness.

How to Learn
Higher Academic Participants

Based on the analysis of the learning method questionnaire data, the indicator that has the highest percentage is repeating lessons at 89.4% in the very good category. On the results of the questionnaire and the reasons for the students in the interview questionnaire and observation of the students, the indicators of repeating lessons were in the very good category. One of them is shown in statement number 14 which has the highest percentage on this indicator, namely "I take tutoring in certain subjects outside of school to repeat lessons" as many as 91 students (83.5%) give an answer always. Students think that if they take tutoring outside of school, students can repeat certain subject matter that students have not understood, then students can re-understand subject matter that students think is difficult. For other questions on this indicator, students provide responses such as students repeating school lessons independently at home, so that students understand the lessons that have been delivered by the teacher so that when there are tests or exams students can answer questions properly. In line with the opinion of Slameto (2013) argued that the factor of poor learning methods is the cause of the fact that there are still many students who are actually smart but only achieve achievements that are no better than students who are actually less intelligent but are able to achieve high achievements because they have a good way of learning. Many students fail or do not get good results in learning because they do not know effective learning methods.

The indicator that has the lowest percentage is the indicator of taking the exam with a percentage of 75.6%

which is in the good category. Shown in question number 25 "I am working on practice questions or sample questions that have been discussed" as many as 53 students with good responses (48.6%). Based on the results of the assessment and the students' reasons, they will discuss examples of questions at home that have been given by the teacher. In order to be able to repeat the lessons that have been delivered by the teacher, the students repeat again discussing the example questions so that during the exam they do not fail. In line with Gie (1998) every test is usually only possible to pass with students if they have prepared themselves as well as possible. Therefore, the main foundation and main activity for advancing in exams is to study as well as possible.

Based on the results of the correlation test of high academic students between learning methods and learning outcomes, it shows that academic students have a significant relationship with an r-test of 0.308 which is in the low category with a contribution of 9.4%. This is because the learning fatigue of students is not only influenced by the learning method, but there are many other factors that influence it. From the several explanations of the indicators for how to learn above, it is reinforced by an opinion which illustrates the importance of these indicators in achieving maximum learning outcomes. According to Gie (1998) studying diligently and systematically is important for someone who wants to succeed in their academic achievements. Learning must be well managed so that time, energy and thoughts can be used effectively and efficiently.

According to Indrawati (2015) that students who have high intelligence and learn in a good and appropriate way will be able to develop new concepts by combining various basic concepts as a support for solving problems, because in students there is persistence, interest, tenacity, curiosity and power.

According to Ernita et al. (2006) the ways of learning that we understand are methods or tips to improve learning achievement that must be passed to achieve certain goals in learning and these methods will become habits in learning. A small example when students start learning by praying first, the way of learning is also closely related to students' skills in managing study time, book reading skills, lesson memorization skills, note-taking skills.

Low Academic Students

Based on the results of the data analysis of the learning method questionnaire, the indicator that has the highest percentage is the indicator of concentration with a percentage of 78.4% which is in the good category. Based on the results of the students' questionnaire, this indicator is in the good category because with a calm class situation, students will easily concentrate on

learning. This is indicated by the number of students answering frequently as many as 43 students (39.45%). With a calm atmosphere it will help students focus on understanding the material so that when asked by the teacher they can answer it, but some of the students still like to fight because they are still passive during the learning and teaching process. Characterized by material that is not understood, students are lazy to ask questions to the teacher and are more silent because they are embarrassed and afraid of being laughed at.

Furthermore, the indicator that has the lowest percentage, namely making a schedule and implementing it with a percentage of 51.4% is in the sufficient category. Based on the results of the student questionnaire, this indicator is in the moderate category marked by the number of students who sometimes give answers to statement number 1 "I make a study schedule or divide study time" as many as 68 students (62.39%). Students rarely make a schedule for studying, they will make a schedule and share their study time if they want to face exams like last night's race. Leisure time of students is mostly used for playing gadgets, watching and hanging out with friends. Students admit that they rarely even never arrange a study schedule because school hours are long so that after school students immediately take a break.

According to Iffah (2021), the center of learning begins is to choose an efficient study time. Determination of learning time is a very central role. Preferably, study time is structured in the form of daily activities. Placement of study time in daily activities must consider environmental conditions, physical and physiological conditions. According to Slameto (2013) that for the smooth learning and success of children, it is necessary to cultivate good relations within the family. If parents are concerned, then the child will study regularly at home or at school without feeling forced. Then the results of this study are in line with the opinion of Rohmawati et al. (2012) stating that learning methods are one of the internal factors that influence learning outcomes. Students who have a good way of learning will have good understanding skills and easily manage time in learning, so they will easily get maximum learning results.

From the results of the study, it was found that students' metacognition awareness is basically a method or learning strategy that is applied as a learning effort in order to achieve the desired learning outcomes. This cannot be separated from the ability of students to process good metacognition awareness which will make it easier for students to learn. The realization of students' metacognition awareness must be encouraged by the teacher. Assessment of the good and bad ways of learning or strategies applied by students will be seen from the learning outcomes obtained by these students.

So that good learning outcomes are also influenced by good learning methods as well as metacognition awareness.

The correlation between metacognition awareness, way of learning and students' biology learning outcomes is known by conducting correlation analysis. Researchers use the Product Moment correlation formula (PPM) from the results of the analysis that:

The correlation coefficient (R test) is 0.418 with a significant level of 5%, this shows metacognition awareness, ways of learning and biology learning outcomes of class X high school students at SMA N Bangkinang city District have a moderate correlation. From testing the hypothesis obtained t test (4.75) > t table (1.98). It means that Ho is rejected and Ha is accepted, which reads that there is a significant relationship between metacognitive awareness, way of learning and learning outcomes of class X high school students in Bangkinang City High School. Then from the results the coefficient of determination was obtained at 17.4%, meaning that the variables of metacognition awareness (X1) and learning methods (X2) gave positive things to learning outcomes (Y) obtained by students at 17.4% while 82.6% was determined by variables or other factors that can affect student learning outcomes that are not discussed in this study.

The correlation coefficient (r test) is 0.447 with a significant level of 5%, this shows metacognition awareness, learning methods and biology learning outcomes of students from low to high class X in SMA N Bangkinang city has a moderate correlation. From testing the hypothesis obtained t test (5.16) > t table (1.98). It means that Ho is rejected and Ha is accepted, which reads that there is a significant relationship between metacognitive awareness, ways of learning and learning outcomes of class X low academic students at SMAN Bangkinang city District. Then from the results the coefficient of determination was obtained at 44.7%, meaning that the variables of metacognition awareness (X1) and learning methods (X2) gave positive things to learning outcomes (Y) obtained by students at 44.7% while 55.3% was determined by variables or other factors that can affect student learning outcomes that are not discussed in this study.

There is an interaction between metacognition awareness, way of learning and learning outcomes of class X biology students at SMA N Bangkinang city.

Interaction of Metacognition Awareness, How to Learn with Learning Outcomes

The interaction between metacognition awareness and students' learning methods at school and at home with biology learning outcomes obtained based on the level of academic ability of class students. Based on this,

it can be seen that metacognition awareness and learning methods are one of the factors that have a contribution in determining the learning outcomes obtained by students.

The results of this study are in line with research conducted by Masrura (2017) examining the effect of metacognition awareness on the academic achievement of FMIPA students at the University of West Sulawesi. The results of this study indicate that: (1) most students of FMIPA, University of West Sulawesi have metacognition awareness which is in the high category. (2) metacognition awareness has a positive and significant effect on student academic achievement.

Conclusion

Based on the results of research data and analysis of research data that has been described, it can be concluded that: there is a significant relationship between metacognition awareness, way of learning and metacognitive awareness with learning outcomes based on the ability level of high academic students in class X at SMAN Bangkinang city with an r test of 0.418 in the medium category. There is a significant relationship between metacognitive awareness, ways of learning and metacognitive awareness with learning outcomes based on the level of low academic ability of class X students at SMAN Bangkinang city with an r test of 0.447 in the medium category. There is an interaction between metacognitive awareness and the way students learn.

Author Contributions
Dian Intan conceptualized research ideas, designed methodology, conducted research, analyzed data, management and coordination responsibility. Moralita Chatri conducts literature reviews and provides suggestions in compiling articles.

Conflicts of Interest
The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results

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