International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

http://ijpsat.ijsht-journals.org
Vol. 22 No. 1 August 2020, pp. 118-126

The Influence of the Question Students Have Learning Model by Paying Attention to Initial Ability on Participants' Competencies Class X student at SMAN 4 Kerinci

Fitria, J[1], Chatri, M. [2], Lufri[3] and Syamsurizal*[4]

[1]Master Degree Program of Biology Education, Faculty of Mathematics and Sciences,
Universitas Negeri Padang
Jl. Prof. Dr. Hamka Air Tawar Barat Padang - 25131 Indonesia

[234] Lecturer of Biology Department, Faculty of Mathematics and Sciences,
Padang State University

Abstract – This study aims to determine the effect of the question students have learning model by paying attention to the initial ability of students' learning competencies. This type of research is a quasi-experimental research design with a randomized control group postets only design. The research sample consisted of class X MIPA3 as the experimental class and class X MIPA4 as the control class. The instruments used were test and non-test. Data analysis was performed using the two-way ANOVA test for knowledge competence and t-test for attitude and skill competency. The findings show that there is a significant difference between the competence of students in the experimental class and the control class, where the competence of students in learning biology in the experimental class is higher than the control class. The assessment is carried out on the competence of students such as aspects of knowledge, attitudes, and skills. In the aspect of knowledge the average value of the experimental class students was 79.13 and the control class was 69.07. In terms of students' attitudes, the average score in the experimental class was 80.93 and in the control class was 74.05. Aspects of skills, the average score in the experimental class is 85.37 and 76.03 in the control class. The results of statistical tests showed significantly different learning outcomes in the aspects of knowledge, attitudes and skills. The application of question students have learning in biology learning can improve the learning competence of students in the aspects of knowledge, attitudes and skills.

Keywords – Question Students Have Model, Initial Ability and Learning Competence.

I. INTRODUCTION

The role of the teacher in the learning process does not only appear as a teacher, but instead acts as a trainer, supervisor and manager of learning from students in the learning process (Hamdayama, 2016). Learning is an activity to create situations and conditions that can attract students to learn (Rochman, 2007).

Learning activities that occur in school, the teacher is the party most responsible for the learning outcomes of students. The role of the teacher in the learning process, the teacher does not only appear as a teacher, but switches as a trainer, mentor and manager of learning from students (Hamdayama, 2016).

Biology is a body of science. Biology is always related to everyday life such as health, the environment, food to the interaction of living things, and so forth. Biology subjects are developed through the ability to think analytically, inductively and deductively to solve problems related to natural events around them (Depdiknas, 2016).

Corresponding Author: Syamsurizal

Biology learning is said to be ideal if it is able to improve the learning competence of students (Lestari, et al., 2019). Achieving good learning competencies does not only depend on the ability of the teacher but also depends on the environment, memory or input of these learners. If the environment and student input are good, the learning outcomes will also be good and if the environment and student input are low, the learning outcomes will be less good (Huang, 2008).

Some of the causes and problems that exist in the field, it is known that teachers still emphasize aspects of the knowledge of students only. Teachers more assess the competence of students from their learning outcomes. The learning competence of students, not only from knowledge, but includes aspects of attitudes and skills that have an equal role in knowledge to achieve good learning outcomes.

The 2013 curriculum in building student competencies does not only focus on attitudes and knowledge competencies, but skills competencies are inseparable from graduate competency standards, content standards, process standards and assessment standards (Yanti, et al).

Based on the results of the questionnaire analysis that the researcher conducted with 40 students in class X SMAN 4 Kerinci on October 23, 2019, it was known that 75.21% of teachers used the lecture, discussion and question and answer method. 88.75% of teachers use textbooks during the learning process. 43.75% of students ask and answer questions from the teacher.

Based on the results of observations in class X SMAN 4 Kerinci through interviews with biology teachers, it is known that there are still many students who do not participate actively in learning, especially in asking and arguing, the rest is only students who have the potential above the average number of students in the class. who are able to dare to ask or have an opinion. This will affect understanding biology material well and students will find it difficult to interact with teachers or with other students when learning takes place. Students consider biology learning as a subject that is difficult for them to understand, so that their competence in learning biology is still low.

The low learning outcomes indicate the initial ability of class X students not being noticed by the teacher. The initial ability of students obtained by researchers is based on daily tests of class X MIPA in the 2019/2020 Academic Year ie the average value is still below the KKM value (75). The low learning outcomes of students are also influenced by external factors, namely the influence of the learning methods or models used by the teacher and internal factors, namely the initial abilities of students that have not been considered by the teacher so that it will have an impact in understanding the material to be studied next.

Initial ability is a prerequisite that students must have before entering the next higher subject matter (Sudjana, 2005). By knowing students' initial mastery of abilities, the teacher can determine where to start the lesson. The initial abilities possessed by students can be the basis for teachers in providing and managing the learning process that is applied (Ali, 2004).

Based on the above problems, to build concepts on the plantae and animalia material as well as participation, and the activeness of students in asking questions, one alternative that is thought to be able to overcome these problems is by applying the question students have learning model.The question students have learning model is an easy way to learn the desires and expectations of students. This method uses a technique to get participation in asking questions through writing rather than conversation (Siliberman, 2009). Question student learning model have is an easy way to learn about the desires and expectations of students and this method uses a technique of getting participation through writing rather than verbal or conversation (Hamruni, 2012).

Based on the description of the background of the problem above, it is known that there has been no application of the question students have learning model in class X SMAN 4 Kerinci and also knowing the advantages of using this model, the researchers are interested in conducting research on "The Effect of Question Students Have Learning Model by Paying Attention to Ability. The Beginning of the Competence of Class X Sman 4 Kerinci Students ".

II. METHODOLOGY

This research is a quasi-experimental research. The population is class X MIPA SMAN 4 Kerinci students who are registered in the 2019/2020 academic year. The research sample was taken by sampling, so that class X MIPA 3 was obtained as the experimental class by applying the question students have learning model and class X MIPA4 as the control class using the conventional model. Data analysis was performed using a two-way ANOVA test for knowledge competence, and t-test for attitude and skill competency.

III. RESULTS AND DISCUSSION

The data obtained in this study were the competence of knowledge, attitudes and skills of students towards the experimental and control classes. Syamsurizal, (2018) states,

collecting information and evidence of achievement of student learning outcomes can be done formally (tests) or informally (non-tests). The test is used in the domain of knowledge, namely objective questions, while non-tests in the realm of attitudes and skills use observation sheets.

A. Results

1. Knowledge Competence

Table 1. Data Analysis of Students' Knowledge Competencies after Learning Using the Question Students Have Model by Paying Attention to the Initial Ability of Class X Students at SMAN 4 Kerinci.

Parameter	Class		Information
	Eksperiment	Control	
Average	79,13	69,07	$\bar{x}_1 > \bar{x}_2$
Normality test	0,16	0,15	Normally Distributed
Homogeneity Test	0,11 (α = 0,05)		Variance Homogeneous

Based on Table 1 above, it is known that the average value of the learning competence of students in the experimental class is 79.13 and 69.07 in the control class. These results indicate that the average score of the experimental class students in the realm of knowledge is higher than the control class. The results of the normality test for the domain of knowledge of the two sample classes obtained values of 0.16 and 0.15 (> 0.05), which means that the data were normally distributed. The results of the homogeneity test of the knowledge domains of the two sample classes obtained a value of 0.11 (> 0.05) which means the data is homogeneous. Hypothesis testing used two-way ANOVA test using SPSS 16 application. Two-way ANOVA test results data can be seen in Table 2.

Table 2. Data of Two Way Anova Test Results Competency Knowledge and Initial Ability of Students in Sample Classes

Parameter	Mean Square	F	Sig.	Information
Class(Model)	1520,06	158,34	0,00	Significant
Initial Ability	1401,66	146,00	0,00	Significant
Class * Initial Ability	24,06	2,50	0,11	No Interaction

Based on Table 2, the two-way ANOVA test results on class parameters obtained the sig value. equal to 0.00 (<0.05) so it can be concluded that there is a significant difference in the knowledge competency scores of students between the experimental class and the control class. In the initial capability parameter sig. of 0.00 (<0.05), so it can be concluded that there is a significant difference in the knowledge competency scores of students between the groups of students who have high initial abilities and the groups of students who have low initial abilities.

2. Attitude Competencies

The results of the research on the effect of the question students have learning model on the competence of students' attitudes on Plantae and Animalia material in class X MIPA can be seen in Table 3.

Table 3. Analysis of Attitude Competency Data After Learning Using the Question Students Have Model for Class X SMAN 4 Kerinci Students

Parameter	Class		Information
	Experiment	Control	
Average	80,93	74,05	$\bar{x}_1 > \bar{x}_2$
Normality test	Sig = 0,20 > α = 0,05	Sig = 0,20 > α = 0,05	Normally Distributed
Homogeneity Test	Sig = 0,76 > α = 0,05		Variance Homogeneous
Hypothesis testing	Sig.= 0,00 < α = 0,05		Hypothesis accepted

Based on Table 3, the average attitude score of the experimental class students was higher, namely 80.93 compared to the control class, namely 74.05. The results of the normality test of the attitude data for the two sample classes obtained values of 0.20 and 0.20 (> 0.05), which means that the data were normally distributed. The results of the homogeneity test of the knowledge domains of the two sample classes obtained a value of 0.76 (> 0.05), which means that the data was homogeneous, then continued with the t-test. The results obtained in the attitude hypothesis test are 0.00 (<0.05), this means that the hypothesis is accepted.

3. Skill Competencies

The results of research on the effect of the student have question learning model on the students' competency skills in plantae and animalia material in MIPA Class X, can be seen in Table 4.

Table 4. Data Analysis Skills Competency After Learning Using Question Students Have Model Students Class X SMAN 4 Kerinci

Parameter	Class		Information
	Eksperiment	Control	
Average	85,37	76,03	$\bar{x}_1 > \bar{x}_2$
Normality test	Sig = 0,19 > α = 0,05	Sig = 0,18 >α = 0,05	Normally Distributed
Homogeneity Test	Sig = 0,28 > α = 0,05		Variance Homogeneous
Hypothesis testing	Sig.= 0,00 < α = 0,05		Hypothesis accepted

Based on Table 4, the average skill score of the experimental class students was higher, namely 85.37 compared to the control class, namely 76.03. The results of the normality test of the realm of the skills of the two sample classes obtained values of 0.19 and 0.18 (> 0.05), which means the data are normally distributed. The results of the homogeneity test of the knowledge domains of the two sample classes obtained a value of 0.28 (> 0.05), which means the data was homogeneous. Then it was followed by the t-test, the results obtained were sig. 0.00 (<0.05), this means that the hypothesis is accepted.

B. Discussion

1. Knowledge Domain Competencies

Getting optimal learning outcomes for students cannot be separated from careful preparation and a predetermined learning plan. Based on the results of the research that has been conducted, by applying the question students have learning model has a positive impact on learning competencies in the realm of knowledge of students. This can be seen from the average score of knowledge competency from the tests that have been given to the experimental class. Assessment of knowledge competencies can be carried out using tests (Sudjana, 2008). The type of test conducted in this study is posttest. The posttest aims to measure the level of mastery of the plantae and animalia concepts in the sample class after being given treatment.

The results obtained from this posttest that the average score in the experimental class using the question students have learning model was higher, namely 79.13 compared to the control class using conventional learning, namely 69.07. The increase in learning outcomes in the realm of knowledge is in line with the results of previous research conducted by Aprianto (2017) which shows that the learning outcomes of students in the realm of knowledge after being given the question students have learning model are higher than the learning outcomes of students given conventional learning models. Applying the question students have learning model is more effective on student learning outcomes than conventional learning (Nurhayati, 2009).

Based on the results of the first hypothesis test on the learning competence of the students in the experimental class who apply the question students' learning model there is a real difference from the control class applying conventional learning with a significance value of 0.00 which indicates that the hypothesis is accepted. This means that the knowledge competence of students who follow the question students have learning model is better than the knowledge competence of students who take conventional learning.

The high competence of students' knowledge in the experimental class compared to the control class is due to the increased activity and motivation of students who follow the question students have learning model. There are several factors that cause an increase in student learning outcomes

using the question students have learning model. First, the question students have learning model requires students to actively ask questions and express ideas. The questions that are made require them to first read the material to be studied so that these students have to think about solving the problem.

Second, the question students have learning model emphasizes mutual cooperation with students regarding these problems with their teachers or friends and they think and share. This can be seen from students who are busy in group discussions discussing questions that have been made by each student so that it makes learning fun and student-oriented.

Growing student-oriented learning, the teacher can do one of them, namely, asking students to make questions in written form (Rusman, 2012). In question students have learning activities can involve all students actively in learning, because each student is required to make questions about the learning material studied in pieces of paper that have been provided.

In this study, it was also seen that students who previously did not dare to express questions orally became more enthusiastic because they could express the questions they had through writing, meaning that students would gain new insights from their own questions. The question students have learning model is a technique that is easy to do and easy to use to find out the needs and expectations of students (Zaini, 2008). Thus students have more control over and understand the subject matter and learning competencies in the realm of the knowledge of the students that are obtained for the better.

The question student learning model has in its implementation developed through group discussions. Students in groups will analyze the data obtained to find a concept in the teaching material (Dougla and Chiu, 2012). Each student can work directly to make questions and read each question in the group into their responsibility. Group members consist of students with various abilities, consisting of 6 people in 1 group. This is supported by KeenGwe (2009) which states "diverse learners imply that teachers provide opportunities for every student to learn in a safe and conducive environment".

Learning that involves students actively in thinking activities by generating understandings about themselves and their environment, students learn to work together in a process (Sigler and Saam, 2007). In conventional learning, teachers design learning using the lecture and discussion method. In this case the proportion of the lecture method is greater than the time provided by the teacher to carry out the discussion. Thus the time for students to share with their themes is little, causing the low enthusiasm of students in following the learning process.

In the control class, learning outcomes in the domain of knowledge are lower than in the experimental class, because the control class uses conventional learning. When learning activities take place, students still seem less active in the learning process. When students are exposed to discussions, students find it difficult to interact with friends and teachers during question and answer activities. Only a few students are active in discussions, the rest students are more silent and rely more on the explanation of the material presented by the teacher, so that the learning capital of students is low.

The difference in the learning process, in this case, it is clear that the difference in the learning process in the experimental class and the control class is clear, so that with these differences, it is also seen that there are differences in learning outcomes in the domain of students' knowledge. Students who take the question students have learning model have an average value of competency in the domain of knowledge that is better than students who take conventional learning.

The learning process in the experimental class and the control class both classifies students based on students' initial abilities based on their posstest scores. In this study consisted of an experimental group with high initial abilities and low initial abilities. Determination of high and low initial students by dividing students with the percentage of 50% in the high initial ability and 50% with low initial ability based on the scores obtained by students. Based on the results of the study, the experimental class average value based on high initial ability is 83.33 d higher than the control class average value, namely 74.53. Likewise, the students' low initial ability in the experimental class with an average value of 74.93 was higher than the control class, namely 63.60.

Then the results of the first hypothesis test with the two-way annova test on the learning competence of students with high and low initial abilities in the experimental class, there is a significant difference with the control class with a small significant value of α (0.05) which shows the hypothesis is accepted, then the test is carried out. further namely the Bonferroni test. The results of the Bonferroni test show that there is a significant difference between groups of students with high and low initial abilities in the class using the question students have and conventional learning models. This can be seen from the significance value between the initial ability groups which is smaller than α. So it can be concluded that all groups have significant differences. Thus

it is known that the knowledge competence of students with high initial abilities and students with low initial abilities who are given the question students have learning treatment has a positive influence on the competence of students' knowledge domains compared to conventional learning.

One of the benefits of early abilities is helping students to connect initial abilities and new concepts so that a good understanding of concepts can be formed by students (Svinicki in Irawati, 2015). Grouping students based on ability so that teachers can find out the initial abilities of students before learning takes place (Harjanto, 2006).

The results of previous research by Rahmi (2015) also stated that the learning outcomes of experimental class students based on high initial ability using the question students have learning model were better than the learning outcomes of the control class with high initial ability using conventional learning and vice versa. . The initial ability obtained from academic scores has a better effect on learning outcomes in the realm of student enforcement by using the question students have learning model than using conventional learning (Bahri, 2011). The choice of learning model greatly affects the learning outcomes of students with high initial abilities and low initial abilities (Andriani, 2017).

This is because the student have question learning model divides students into groups heterogeneously, so that students can help each other, discuss with each other and issue opinions. So that it allows interaction in the teaching and learning process between teachers and students as well as between students and other students, whereas in conventional learning only requires students to solve the problems that exist in the questions in the textbook without knowing further the problems actually experienced by participants students, therefore teachers need to pay attention to the factors that may affect learning outcomes before implementing learning strategies in class.

Judging from the results of the two-way ANOVA test on the interaction between the class (model) and the initial ability, the significance value is greater than α for the class interaction parameter with initial ability. This means that the hypothesis which states that there is an interaction between the learning model and the initial ability to the learning outcomes of competent knowledge is rejected. The interaction between learning models with different initial abilities does not significantly affect the learning outcomes of knowledge competencies.

The curves of the two-way ANOVA test results do not intersect each other, so the curve formed shows that there is no interaction between the learning model and the initial ability. If the curves cross each other, there is interaction, if the curves are up, parallel and do not cross each other, there is no interaction, and if the curves are horizontal and parallel there is no interaction (Sugiyono, 2012). The results of previous research conducted by (Bahri, 2013) also stated that the interaction between the question students have learning model and initial abilities did not have a significant effect on learning outcomes in the realm of knowledge.

The student have question learning model that is implemented is able to improve students 'learning competence in biology so that it can be used as an appropriate model in the learning process to see students' initial abilities. The initial ability of students is important for the teacher to know so that they can provide the right learning model (Sadirman, 2006). So, the main factor that can increase the competence of students' knowledge in biology is not the initial ability but the application of the question students have learning model. Even though the learning outcomes of students are evidence, both as a whole and seen from each of the students' initial abilities. Learning outcomes will be influenced by the learning model, curriculum design, and teaching (Hung Lin, 2017).

2. Attitude Competence

Attitude is defined as an internal state that affects the individual towards actions directed at objects (objects) or events. Attitude is an assessment of students' behavior and beliefs about an object, phenomenon / problem (Salamah, 2018). The attainment of attitudinal competence from the research results showed that the average score of students in the experimental class was 80.93, while in the control class it was 74.05. Based on data analysis on the third hypothesis test, a significance value is obtained, namely 0.00, which indicates that the hypothesis is accepted. This means that the attitude competence of students who follow the question students have learning model is better than the attitude competence of students who take conventional learning.

The high value of competence in the realm of attitude in the experimental class is inseparable from the high activity and involvement of students in learning. This is because the experimental class uses question students have learning which can stimulate students to be more able to develop good attitude values in the biology learning process. Attitude is an assessment of the behavior and beliefs of students towards an object, phenomenon or problem (Salamah, 2018). The question students have learning model in learning helps

students to develop learning competencies in the realm of attitudes.

Based on the observation of the assessment of students' attitudes during the question students have learning activities, students have a high responsibility in solving the questions they have, students share known information with their friends during the discussion. The curiosity of students is higher towards the material being studied, this can be seen from the questions that have been written by students. The disciplinary attitude of students is also higher, it can be seen from the students being present on time at the time of learning biology, students paying attention to the teacher when explaining the material and collecting assignments on time. The teacher as a teacher does not dominate activities, but helps create conducive conditions and provides motivation and guidance so that students can develop their potential and creativity, through learning activities (Sadirman, 2004).

Students in the experimental class provide a different atmosphere in learning, because students have the opportunity to write down what they do not understand. In group discussions, students discuss questions together, thereby fostering a positive attitude in students. Learning with the question students have learning model provides more opportunities for students to further develop themselves. This is in accordance with the statement of Majid (2014), in the learning process students need to have a positive attitude, with a positive attitude in students themselves will grow and develop learning intentions, will be easier to be motivated, and will easily absorb the lessons taught.

The competence of the attitudes of students in the control class as a whole obtained attitude assessment criteria with sufficient predicate. This is because, in the control class that applies conventional learning students are still less active in the learning process, so that students' curiosity, responsibility and disciplinary attitude towards students in surrounding conventional learning is still lacking. This can be seen from the low understanding of the material, there is still a sense of shame and anxiety in asking questions, and having opinions.

Based on the explanation above, the learning process in the two samples, namely the experimental class and the control class, has a significant difference in the realm of attitudes. Learning that applies the question students have learning model is better than the control class by applying conventional learning.

3. Skills Learning Competencies

Achievement of competence in the realm of skills from the results of the study, the average competence of students' skills in the experimental class was 85.37, while in the control class it was 76.03. Based on the data analysis on the fourth hypothesis test, a significance value is obtained, namely 0.00, which indicates that the hypothesis is accepted. This means that the skill competencies of students who take the question students have learning model are better than the skill competencies of students who take conventional learning.

Based on the researchers' observations, it was found that positive skill changes occurred in students who were filled in by the observer every time the learning took place. The high acquisition of competency skills in the experimental class is due to the influence of the question students have learning model, where students are required to be more skilled in asking questions properly in learning activities, and skilled in writing discussion reports according to the material being studied. Active learning is that students become active participants in the learning process, which is an important means of developing the skills of students (Karamustafaoglu, 2009). Learning in the question students have learning model is a learning model developed to train students to have the ability and skills to ask questions (Suprijono, 2009).

The teacher is also in charge of providing motivation so that students are more active and serious in discussions during the learning process, because the motivation and willingness to learn of students will determine the learning outcomes achieved so that students are able to make conclusions correctly, precisely and in accordance with the material being studied. This is in accordance with what Yong (2009) stated that discussion of students in small groups can increase the activity of students so that it becomes motivation that can improve student learning outcomes. Group discussions make students talk, ask questions, and are directly involved in learning, compared to teacher-centered learning (Lord, 2001).

In the control class using conventional learning models, students are still less motivated to learn and still lack understanding of learning concepts. This can be seen in the discussion process of students and when students work on assignments given by the teacher, the results of the discussions written based on the tasks in the textbook are not neat and not clean, because participants feel lazy to fill in the exercises. Students also do not understand the concepts of material in discussion, which is clearly seen during group discussions and presentations. During the group discussion,

only a few asked, responded and tended to be only smart students who responded. Students who appear also do not understand the material that is being studied, so that they require the teacher to explain the material again in detail.

The learning process of the two sample classes, namely the experimental class and the control class, has a significant difference. The competency of the skills domain of students who follow the question students have learning model is better than the competence in the domain of skills of students who take conventional learning.

IV. CONCLUSION

The conclusion of this study is that the question students have learning model by paying attention to the initial ability can increase the knowledge competence of students. The question students have learning model can improve the competence of attitudes and skills of students and there is no interaction between the learning model and the initial ability to the learning competence of students.

REFERENCES

[1] Aprianto, R. 2019. Pengaruh Strategi Pembelajaran Aktif *Questions student have* (QSH) Berbantuan Media Gambar dan Kemampuan Awal Terhadap Kompetensi Belajar Peserta Didik Kelas X SMA Negeri 10 Kerinci. (*Tesis*). Padang: Univeristas Negeri Padang.

[2] Arikunto. 2015. *Dasar-dasar Evaluasi Pendidikan*. Jakarta: Bumi Aksara.

[3] Ali, M. 2004. *Penelitian Pendidikan, Proses dan Strategis*. Bandung: Anglkasa.

[4] Andriani, A. 2017. Interaksi Antara Model Pembeljaran dengan Kemampuan Awal Matematika Terhadap Peningkatan Kemampuan Pemecahan Masalah Matematika Mahasiswa FMIPA Pendidikan Matematika. *Jurnal SEMANSTIKAUNIMED*. ISBN: 978-602-17980-9-6.

[5] Bahri, A., Azis, A. A., dan Amin, N. F. 2012. Penerapan Strategi Pembelajaran Aktif Question Student Have dan Kemampuan Akademik Terhadap Hasil Belajar Kognitif Siswa Kelas VIII SMPN 2 Camba. *Sainsmat*, *1*(1), 41-51.

[6] Douglas, E. P., dan Chiu, C. C,. 2012. Process-oriented guided inquiry learning in engineering. *Procedia-Social and Behavioral Sciences*, *56*, 253-257.

[7] Depdiknas. 2016. *Permendikbud Nomor 2003 Tahun 2016 "Tentang Standar Penilaian Pendidikan"*.

[8] Hamdayama, J. 2016. *Metodologi Pengajaran*. Jakarta: Bumi Aksara.

[9] Huang, Y. M. H. T. C., and Hsieh, M. Y. 2008. Using Annotation Services in a Ubiquitous Jigsaw Cooperative Learning Environment. *International Journal of Educational Technology & Society.* 11(*2).*

[10] Harjanto. 2006. *Perencanaan Pembelajaran.* Jakarta: Rineka Cipta.

[11] Hamruni. 2012. *Strategi Pembelajaran*. Yogyakarta: Insan Madani

[12] Irawati, R. K. 2015. The Effect of Problem Solving and Problem Posing Models and Innate Ability to Students Achievement. *Jurnal Pendidikan Sains*, *2*(4), 184-192.

[13] Karamustafaoglu, O. 2009. *Active Learning Strategies in Physics Teaching*. *Online Submission*, 1(1), 27-50.

[14] Keengwe, J., G. Onchawari, & Onchawari, J. 2009.*Techanology and Student Learning: To Word A Learner Centered Teaching Model. AACE Journal*. 17(2): 11-12.

[15] Lufri. 2007[a]. *Strategi Pembelajaran Biologi Teori, Praktek dan Penelitian*. Padang: UNP Press.

[16]. 2017[b]. *Metodologi Penelitian*. Padang: UNP Press.

[17] Lestari, S. 2008. Pengaruh Penggunaan Model Pembelajaran Inquiri Terbimbing dengan Media Audio Visual dan Modul Bergambar Disertai LKS Terhadap Prestasi Belajar Fisika Ditinaju dari Kemampuan Awal dan Aktifitas Belajar Siswa. (*Tesis*). Surakarta: Universitas Sebelas Maret.

[18] Lestari, A., Darussyamsu, R., Farma, S., & Syamsurizal, S. (2019). The Influence of the Cooperative Learning Model PQ4R Type Containing Science Literacy on Students Learning Competencies of Ecosystem Material at SMA Negeri 1 Baso. *Atrium Pendidikan Biologi*, *4*(4), 52-62.

[19] Lord. T. R. 2001. "101 Reason For Using Cooperative Learning In Biology Teaching". *The American Biology Teacher*, 63(1). 31-34.

[20] Majid, A. 2014. *Perencanaan Pembelajaran.* Bandung: Remaja Rosdakarya.

[21] Nurhayati, S., Mahatmanti, F. W., & Khodijah, F. D. (2009). Keefektifan Pembelajaran Berbasis Question Student Have dengan Bantuan Chemo-Edutainment Media Key Relation Chart Terhadap Hasil Belajar Siswa. *Jurnal Inovasi Pendidikan Kimia*, *3*(1).

[22] Rahmi, A. 2015. Efektifitas Penerapan Strategi Pembelajaran Aktif *Questions student have* (QSH) Terhadap Kompetensi Hasil Belajar Pada Materi Sistem Eksresi Ditinjau dari Kemampuan Awal Siswa MAN 1 Padang. (*Tesis*). Padang: Univeristas Negeri Padang.

[23] Rusman. 2012. *Model-model Pembelajaran: Mengembangkan Profesional Guru*. Bandung: PT Rajagrafindo Presada.

[24] Sigler, E., & Saam, J. 2007. Constructivist or expository instructional approaches: Does instruction have an effect on the accuracy of Judgment of Learning (JOL)?. *Journal of the Scholarship of Teaching and Learning*, 22-31.

[25] Silberman, M. 2009. *Active Learning: 101 Strategies to Teach Any Subject*. Translated by Sarjuli, Ammar, Sutrisno, Ahmad, dan Muqowim. Yogyakarta: Pustaka Insan Madani.

[26] Sadirman. 2006. *Interaksi dan Motivasi Belajar Mengajar*. Jakrta: PT Rajagrafindo Persada.

[27] Sudjana, N. 2005. *Metode Statistika*. Bandung: Tarsito.

[28]. 2008. *Evaluasi Program Pendidikan Luar Sekolah.* Bandung: PT Rosdakarya Offset.

[29] Syamsurizal, S., Ardi, A., & Muttaqiin, A. (2018). Classroom Based Assessment Development for Improving Science Teacher's Competency in Secondary School at Koto Tangah District. *Pelita Eksakta*, *1*(1), 10-14.

[30] Utami, Y. S., Chatri, M., Yogica, R., & Syamsurizal, S. (2019). The effect of problem based learning (pbl) models containing science literacy on student's learning competencies in digestive system human material at Junior High School 29 Padang. *Atrium Pendidikan Biologi*, *4*(1), 21-29.

[31] Zaini. Hisyam. 2008. *Strategi Pembelajaran Aktif*. Yogyakarta: Pustaka Insan Madan