International Journal of Social Science and Human Research

ISSN (print): 2644-0679, ISSN (online): 2644-0695

Volume 08 Issue 01 January 2025

DOI: 10.47191/ijsshr/v8-i1-06, Impact factor- 7.876

Page No: 46-53

Influence Of Discovery Learning Model and Learning Motivation on Physics Learning Outcomes in Students

Fauziah[1], Muhammad Arsyad[2], Helmi[3]

[1,2,3]Physics Education, Postgraduate Program, Makassar State University, Makassar, Indonesia.

ABSTRACT: The purpose of this study is to (1) analyze the differences in physics learning outcomes of students in class XI MIPA SMAN 1 Woha who are taught with discovery learning and guided inquiry, (2) analyze the differences in physics learning outcomes of students who are taught with discovery learning and guided inquiry was reviewed from high learning motivation and low learning motivation and (3) analyzed the interaction between discovery learning and learning motivation on students physics learning outcomes. The population consists of class XI MIPA SMAN 1 Woha. The number of samples used in classes XI MIPA 1 and XI MIPA 2 in the experimental and control classes was 66 student. The results of the study showed that (1) $F_{hitung}(4,118)$ > $F_{tabel}(2,901)$**,** meaning that there was a difference in physics learning outcomes between students who were taught with discovery learning and students who were taught with guided inquiry, (2) F_{hitung}**(4,959) >** F_{tabel} **(4,149),** meaning that judging from high learning motivation, there was a difference in physics learning outcomes between students who were taught with discovery learning and students taught with guided inquiry, (3) F_{hitung} **(4,701) >** F_{tabel} **(4,149),** meaning that from the perpective of low motivation, there was a difference in physics learning outcomes between students who were taught with discovery learning outcomes between students who were taugh with discovery learning and students who were taught with guided inquiry, (4) F_{hitung} **(2,692) <** F_{tabel} **(4,149),** meaning that there was on interaction between learning models and learning motivication on the physics learning outcomes of SMAN 1 Woha.

KEYWORDS: Discovery learning, guided inquiry, motivication, physics learning outcomes.

I. INTRODUCTION

Education in the 21st century is an education that integrates knowledge skills, skills, and attitudes, as well as mastery of technology. The competencies of 21st century skills according to the Directorate of Secondary School Development of the Directorate General of Elementary and Secondary Education of the Ministry of Education and Culture in 2017 include: critical thinking and problem-solving skills, communication skills, creativity and innovation skills, and collaboration skills. These skills can be developed through various learning activities based on competency characteristics and learning materials.

Basically, this 21st century competency has been adapted in the education system in Indonesia through the 2013 curriculum. Learning in the 2013 curriculum has the goal of developing students' talents, interests, and potentials to be characterful, competent, and literate (Wahyudin, 2017). To achieve these results, learning experiences ranging from simple to complex experiences are needed. The 2013 curriculum emphasizes character education and the mastery of complete competencies from the aspects of attitudes, knowledge, and skills. (Nursamsu, 2016). This is in accordance with the 2013 curriculum which is a set of plans and arrangements regarding the objectives, content, and subject matter as well as the methods used as guidelines for the implementation of activities. Learning to achieve educational goals. The 2013 curriculum was developed as a step to improve the previous curriculum which is expected to be able to realize the goals of national education and improve the learning mindset such as student-centered learning from the original teacher-centered.

The learning activities in the 2013 curriculum carried out by teachers are inseparable from the application of the learning model. The learning model is one of the ways used by teachers in delivering subject matter. It is hoped that the delivery of the subject matter can be absorbed and understood by students, because this has an impact on the goals to be achieved in the learning process. Improving the quality of learning must be the top priority for a teacher, because the development of a nation is inseparable from a quality and quality education, which starts from the learning process. Therefore, if a nation wants its country to be able to compete with other countries and have a better level of education, then the world of education must be improved in such a way.

In the context of education, student learning outcomes are a very important indicator to measure the effectiveness of the education system. Good learning outcomes reflect understanding, improvement, skills and achievement of educational goals. Therefore, improving student learning outcomes is the main goal of education. The educational objectives are implemented in several subjects, one of which is physics.

Physics is a branch of natural science (IPA) that is closely related to the behavior, structure of objects and one of the subjects that is very closely related to human activities in daily life. Physics as a knowledge that studies natural events and phenomena so that it becomes an interesting lesson to discuss. Therefore, physics lessons should be more oriented to the process of direct activities, experimental discovery. The physics learning process in schools is expected to provide scientific experience to students, provide opportunities to work together to solve problems so that they are able to achieve better results. By using *the discovery learning* model.

Discovery learning is a learning model that can improve students' learning outcomes by finding and solving problems with physics concepts by themselves, which will make the material stored in students' memories longer. *Discovery learning* is expected to help students in providing stimulation, identifying problems, collecting data, processing data, proving, and drawing conclusions. In *discovery learning* , the role of students is more dominant and students are more active, while teachers direct and guide students to the right and correct direction.

According to Junaedi (2019), *discovery learning* is a learning that emphasizes the active role of students. These roles include: (1) exploring and discovering knowledge through observation and experimentation. (2) advise students to review and assess carefully before giving statements or answers. The impact of *discovery learning* is to improve learning outcomes and learning motivation. This is in line with research conducted by Retno (2021), stating that *the discovery learning* model has an influence on increasing students' learning motivation.

Learning motivation is very influential, because without learning motivation students' activities when participating in learning will be reduced. Motivation can also refer to the process of directing activities to the goals that are triggered and initiated beforehand, with the existence of motivation in the learning process can foster a passion for students, as well as the existence of mutual relationships, therefore learning motivation is very important to encourage the will of students so that activities to learn arise. Meanwhile, the external factor is the use of an appropriate learning model, of course, it can motivate students to be active, and the comparative model is the guided inquiry learning model (Timotius, 2020).

The guided inquiry learning model is a learning model that actively involves students in every step of the activity. The main goal in the inquiry-based learning process lies in the ability of students to understand, then identify carefully and thoroughly, and end by providing answers or solutions to the problems presented (Anam, 2016).

Based on the results of observations at SMAN 1 Woha, it was found that in the physics learning process they get, namely: (1) students tend to think that physics learning is complicated, (2) students are less interested in physics lessons so that their curiosity about physics lessons decreases, (3) the learning process is still focused on educators so that learning is very far from the activeness or learning experience of students and (4) The learning process of students sometimes does not pay attention to the explanations given by the teacher because they feel bored and difficult to understand, but there are some students who show high motivation to learn about physics lessons, and feel happy in the learning process.

This is reinforced by the results of an interview with one of the physics teachers at SMAN 1 Woha, who stated that in the learning process at school, students tend to pay less attention, and cannot focus when educators deliver learning materials in class. However, there are indeed some students who show high motivation to learn every time the learning takes place. This can be seen from the value of students' learning outcomes in each task and daily test, some students who have high learning motivation are in the moderate range and the rest are in the low range, so that the students' learning outcomes are still not in accordance with expectations.

Observing the problems that occur, it is necessary to make efforts to overcome learning problems. By paying attention to the habits of students in the learning process who are the same age as them have a higher curiosity, like to search or investigate, then to meet the needs of students at that age, researchers want to see the influence of *the discovery learning* model and students' learning motivation on learning outcomes in physics learning. This learning model expects students to understand physics learning more easily, with an experimental learning method that involves students directly. In learning and at the same time can foster students' motivation to continue learning.

This condition, there is a need for innovation in using several approaches, strategies and learning models. The learning model has a very important role in the success of education. The use of the right model will determine the effectiveness and efficiency of a learning process. One of the learnings that can help students to develop learning outcomes so that students become active in learning becomes student-centered is the *discovery learning learning model.*

The use of the learning model in the classroom is also accompanied by students' motivation to learn or it can be said that students' attention during the learning process to achieve learning outcomes. In this case, learning motivation also plays a considerable role in the achievement of student learning outcomes. Without motivation, students cannot learn. Motivation also depends on the learning model used by the teacher and how to apply it in the classroom during the learning process. A learning model that actively involves students in the learning process makes it easier for students to understand the material because students have experience in solving their own problems, and students feel that they find a learning model that is fun and motivates students to be active in learning that has an impact on learning outcomes that are in accordance with expectations.

Based on this, the researcher is interested in conducting a study entitled Influence of *Discovery Learning* Model and Learning Motivation on Students' Physics Learning Outcomes.

METHOD

A. Types of research

This type of research is an nexperimental research with a true-experimental design. This study consists of an experimental group taught using the discovery learning model and a control group taught using a guided inquiry learning model.

B. Research design

The design of this study uses a 2 x 2 factorial design. Independent Variable is divided into two classes, namely the experimental class and the control class. In the experimental class, the discovery learning model was treated, while in the control class, the guided inquiry learning model was used. The dependent variable is the physics learning outcome in students, and the moderator variable is learning motivation which is divided into two groups, namely students who have high learning motivation and low learning motivation.

Table 1 2x2 Factorial Design

Motivation for learning (B)	Learning Model (A)	
	Discover Learning (A1)	Guided Inquiry (A2)
High (B1)	$Y[A_1B_1]$	$Y[A_2B_1]$
Low (B2)	$Y[A_1B_2]$	$Y[A_2B_2]$
$\sum$	$Y[A_1B_1] + Y[A_1B_2]$	$Y[A_2B_1] + Y[A_2B_2]$

C. Population and sample

The population in this study is all students of class XI MIPA SMA Negeri 1 Woha which consists of seven (7) classes with a total of 237 students. The sample in this study was determined using a simple random sampling technique . The class randomization was carried out by drawing classes that would be used as research samples. From the random class in XI MIPA 1 and XI MIPA 2 as an experimental class with a total of 33 students, then for the control class XI MIPA 2 was obtained with a total of 33 students, so that to determine the category of motivation for learning physics of students according to the design of this study, a division based on the normal curve distribution was used, namely 27% of the student group was selected for high physics learning motivation and 27% from the student group for low motivation to learn physics (Sugiyono 2008). So 60 27% were obtained by 9 students. This means that there are 9 students who are in the high motivation group and 9 students who are in the low physics learning motivation group and each group is taught using ×the discovery learning model and the guided inquiry learning model.

D. Instrument

The research instruments used in this study are as follows.

1. Physics Learning Motivation Instrument

The determination of learning motivation in this study is in the form of a questionnaire sheet. This questionnaire sheet is prepared in the form of a written statement whose answer choices have been provided so that students give a check mark (√) to one of the answers. Answer choice format that contains alternative answer choices: SS: Strongly Agree; S: Agreed; KS: Disagree; TS: Disagree and STS: Strongly Disagree and are given a score of 5, 4, 3, 2, and 1 for positive statements, while for negative statements with answer choices: SS: Strongly Agree; S: Agreed; KS: Kuraang agrees; TS: Disagree and STS: Strongly Disagree and are given scores of 1, 2, 3, 4, and 5. The maximum number of scores that students will get if they succeed in filling in all statements with 5 is 148.

2. Physics Learning Outcomes Instrument

The students' physics learning outcome test is prepared in a written test in the form of multiple choice. The questions are made in the classification of cognitive domains which include: knowledge, understanding, application, and analysis. The answer choice items in the question amount to 5 (five) pieces with the symbol A, B, C, D, and E. Each question item (item) has only one correct answer choice. If students answer correctly, they get a score of 1 (one) and if they answer incorrectly, they get a score of 0 (zero). Further details will be seen in appendix C2 page 172.

E. Preparation phase

Before carrying out physics learning through a problem-based learning model and interest in learning critical thinking skills as intended in this research, several preparations are first carried out, such as conducting observations at the research location and determining the class that will be used as the research object. Then analyze the curriculum to see competency standards and basic competencies so that the subject matter that will be taught is visible. Then create learning tools based on basic competencies that are adapted to the material being taught. The learning tools prepared are RPP, LKPD, and teaching materials. The next preparation is to prepare research instruments in the form of a physics learning interest questionnaire and a test instrument for students' critical thinking skills based on several indicators

F. **Implementation Stage**

Conducting a criterion validation test on a learning outcome test instrument and a learning motivation questionnaire consisting of an expert validation test, an empirical validity test and a reliability test. As for the learning outcome test instrument, it is also equipped with a difficulty test and a difference test. This test was carried out in the classes included in the research sample, namely 33 students of XI MIPA 1 and 33 students of class XI MIPA 2. Providing this learning motivation questionnaire was given to students to determine 4 groups of participants, namely 1) students with High motivation taught using the Discovery Learning model, 2) Students with low learning motivation who are taught using the Discovery Learning model, 3) Students with high learning motivation who are taught using the guided inquiry learning model, and 4) Students with low learning motivation who are taught using the guided inquiry learning model.

Carry out the learning process according to the teaching materials that have been prepared with the discovery learning model and have been validated by experts in the experimental class, namely class XI MIPA 1. At the same time, the learning process was also carried out using a guided inquiry model in the control class, namely class XI MIPA 2.

G. **Final Stage**

This stage is the final stage which includes the implementation of research to obtain research data and make research report results. Some of the preparations made before conducting the research are as follows the provision of learning outcome tests is in the form of multiple-choice questions that have been validated and tested and then given to students who are samples in the study, namely class XI MIPA 1 as an experimental class, and class XI MIPA 2 as a control class. This test aims to measure the learning outcomes of students. Conducting an analysis of the data obtained, then drawing conclusions based on the results of data analysis by comparing the research results of the experimental class and the control class. And make research reports.

H. **Data analysis technique**

The data analysis technique in this research is divided into two parts, namely data analysis related to the instruments that will be used in the research and analysis of data obtained during the research.

RESULTS AND DISCUSSION

The collected data is examined to answer the hypothesis by carrying out prerequisite tests. The prerequisite tests in this research consist of a normality test and a homogeneity test. Normality test results in Table 2 and Table 3

Table 2 Data Normality of Physics Learning Outcome for Experiment Class and Control Class

Class	Sample Size	L count	L table	Information
Experiment	33	0.116	0.154	Usual
Control	33	0.148	0.154	Usual

Can be seen for $\alpha = 0.05$ with the number of samples of 33 students in the experimental class obtained L count = 0.116 and L table = 0.154 which means that the data is normally distributed. In the control class with a sample of 33 students, L count = 0.148 and L table = 0.154 were obtained, which means that the data was normally distributed. Thus, it can be concluded that the physics learning outcome score data of students in class XI MIPA SMAN 1 Woha who use *the discovery learning* model in the experimental class and the guided inquiry learning model in the control class are normally distributed.

Table 3 Data Normality Test of Learning Motivation Score for Experiment Class and Control Class

Class	Sample Size	L count	L table	Information
Experiment	33	0.125	0.154	Usual
Control	33	0.119	0.154	Usual

Can be seen for $\alpha = 0.05$ with the number of samples of 33 students in the experimental class obtained L count = 0.125 and L table = 0.154 which means that the data is normally distributed. In the control class with a sample of 33 students, L count = 0.119 and L table = 0.154 were obtained, which means that the data was normally distributed. Thus, it can be concluded that the physics learning outcome score data of students in class XI MIPA SMAN 1 Woha who use *the discovery learning* model in the experimental class and the guided inquiry learning model in the control class are normally distributed.

Table 4 Data Homogeneity Test

Class	Sampl e Size	Variance	$f$count	$f$table	Information
Experime nt	33	34.45	1.18	4.17	Homogeneous
Control	33	29.23			

From the calculation results, it is obtained or 1.49 < 1.54 for a significance level of 5%. Than it can be concluded that the data on students' critical thinking skills scores for classes taught using the problem-based learning model and discovery learning model is homogeneous.

After fulfilling the prerequisite tests, the hypothesis was tested using two-way ANOVA.Hypothesis testing using two-way ANOVA can be carried out to test the differences in the influence and interaction of the independent and moderator variables on the dependent variable. Explanation of hypothesis test results in Table 5.

Table 5 Two Way ANOVA Test Results

Motivation for Learning Physics	Statistics	Learning Model (A)		∑B
		Discovery Learning (A1)	Guided Inquiry (A2)	
High (B1)	N	9	9	18
	∑X	266	200	466
	∑X^2	7970	4766	1273
	Ẋ	29,55	22,22	51,77
Low (B2)	N	9	9	18
	∑X	201	191	392
	∑X^2	4901	4247	9148
	Ẋ	22,33	21,22	43,55
∑K	Nt	18	18	18
	∑Xt	467	391	858
	∑Xt^2	12871	9013	21884
	Ẋt	25,94	21,72	23,83

Table 5 Overall, there is a difference in the learning outcomes of physics students who are taught using *the discovery learning* model and those taught using the guided inquiry learning model. Shows F_{hitung} =4,118 and =2,901() so it is rejected. This means that there is a difference between the physics learning outcomes $F_{tabel} F_{hitung} > F_{tabel} H_0$ of students who are taught using the *discovery learning* model and those who are taught using the guided inquiry learning model.

There was no interaction between the learning model and physics learning motivation on students' physics learning outcomes.

The interaction effect with the source of the variance of the learning model and the motivation to learn physics resulted in = 2.692 and = 4.149 (). Accepted. This means F_{hitung} $F_{tabel} F_{hitung} < F_{tabel} H_0$ that there is no interaction between the learning model and physics learning motivation on students' physics learning outcomes.

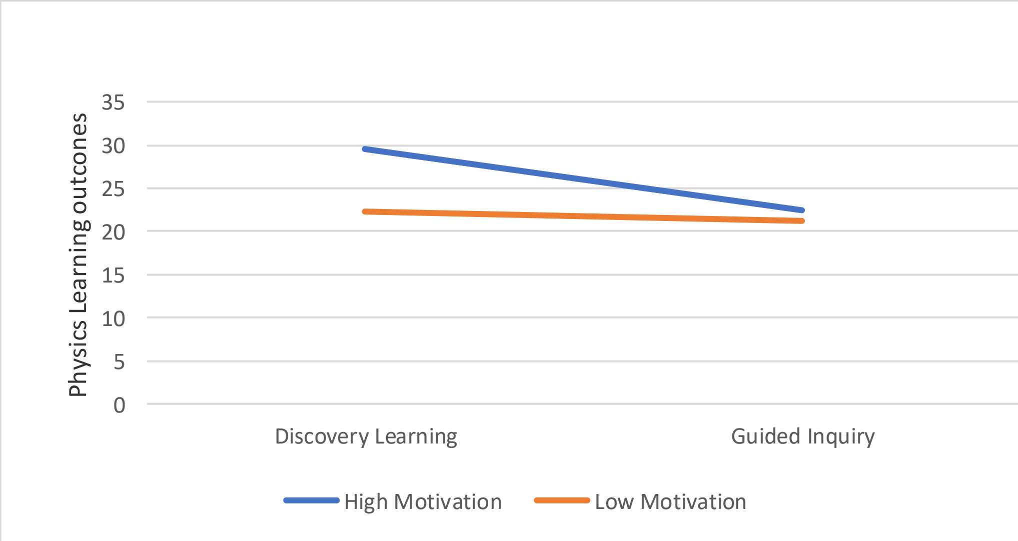

Figure 1 Interaction Patterns of Learning Models and Physics Learning Motivation on Physics Learning Outcomes

Overall, there was a difference in students' physics learning outcomes between those taught using the *discovery learning* model and those taught using the guided inquiry learning model.

The physics learning results of students for classes taught using *the discovery learning* model showed that the material of optical tools increased compared to classes taught using the guided inquiry learning model, where the average score of students with the *discovery learning* modelwhich shows the final test of magnitude and the class taught using the guided inquiry learning model shows the final test result of . $\bar{x} = 26{,}83$ $\bar{x} = 22{,}27$

The first hypothesis testing based on the ANAVA analysis shows and so can be concluded rejected or in other words accepted. This means that overall there is a difference in physics learning outcomes between students who are taught using $F_{hitung} = 4{,}118 F_{tabel} = 2{,}901 (F_{hitung} > F_{tabel}) H_0 H_1$ *the discovery learning* model and students who are taught using the guided inquiry learning model in students in class XI MIPA SMAN 1 Woha.

For students who have high motivation to learn physics, there is a difference in learning outcomes between students who are taught using *the discovery learning* model and students who are taught with the guided inquiry learning model.

The results of this study show that there is a difference in physics learning outcomes of students who have high motivation to learn physics, between students who are taught with *the discovery learning* model and those who are taught with the guided inquiry learning model. Shows values F_{hitung} = 4.959 and = 4.149 (). $F_{tabel} F_{hitung} > F_{tabel}$ This shows that the results of the study are in accordance with the third hypothesis, so it is accepted. This states that the influence of high learning motivation on the physics learning outcomes of students in this study has a significant effect. H_1

The discovery *learning model* applied to the experimental classroom on optical equipment material has an effect on the physics learning outcomes of students with high learning motivation because they are increasingly challenged to develop their knowledge through the problems given. Students who have high motivation to learn are more enthusiastic about carrying out the tasks given, cooperate well, be responsible and have high curiosity. The *discovery learning* model is discovery learning, using highly motivating and interesting questions, tasks or problems to provide knowledge in the context of working together to solve problems. In the control class with guided inquiry learning on optical tools, students, even though they have a high interest in learning, have not been able to develop the ability to think in all directions, which means that students still tend to think in a convergent manner.

For students who have low motivation to learn physics, there is a difference in physics learning outcomes between students who are taught using *the discovery learning* model and the guided inquiry learning model.

Shows a significance value for low learning interest of -F_{hitung} = 4.701 and = 4.149 (). $F_{tabel} F_{hitung} > F_{tabel}$ This shows that H_0 it is rejected and accepted. This means that for students who have low motivation to learn physics, there is a difference in physics learning outcomes of students who are taught with H_1 *the discovery learning model* and students who are taught with the guided inquiry learning model. The total score of physics learning outcomes of students in the experimental class was higher than the physics learning outcome scores of students in the control class.

There is no interaction between the learning model and physics learning motivation on students' physics learning outcomes

Presents the interaction effect with the source of the learning model variance and the physics learning motivation resulting F_{hitung} = 2.69 and = 4.149 (). $F_{tabel} F_{hitung} < F_{tabel}$ This shows the fourth hypothesis that it is accepted and rejected. This means that there is no influence of the interaction between the learning model and physics learning motivation on the students' physics learning outcomes. Students who are taught using the problem-based learning model or the guided inquiry learning model do not have an interaction effect on high or low physics learning motivation. This is because the average physics learning outcome score of students in the experimental class is higher than that of the control class, both in the group of students with high motivation to learn physics as well as in the group of students with low motivation to learn. $H_0 H_1$

The absence of interaction between the application of the learning model and learning motivation is caused by many factors that affect the learning process. Syah (2015) stated that the success of the learning process is influenced by internal and external factors. Internal factors that exist in individuals include attention, motivation, talent, motivation, readiness, and fatigue. External factors include family factors, school factors, and community factors. All internal and external factors in learning are interrelated and affect each other, so that in the learning process it is not only influenced by the learning model and learning motivation but many factors that influence.

Researchers cannot control all factors involved in the learning process, thus there is no interaction between the learning model and students' learning motivation on learning outcomes. The absence of interaction between the learning model and learning motivation on students' physics learning outcomes is suspected to be caused by the strong influence of each variable. This is in line with what Amanda (2014) stated, which states that no interaction occurs because two or more independent variables carry very strong (significant) separate influences on the variable

CONCLUSION

Based on research it can be concluded that: 1) The first hypothesis based on the ANAVA analysis shows and so can be concluded that it is rejected or in other words accepted. This means that overall $F_{hitung} = 4{,}118 F_{tabel} = 2{,}901 (F_{hitung} > F_{tabel}) H_0 H_1$ there is a difference in physics learning outcomes between students who are taught using *the discovery learning* model and students who are taught with the guided inquiry learning model. 2) Testing of the second hypothesis shows values F_{hitung} = 4.959 and = 4.149 (). $F_{tabel} F_{hitung} > F_{tabel}$ This shows that H_0 it is rejected and accepted. This means that for students who have high motivation to learn physics, there is a difference in physics learning outcomes of students who are taught with H_1 *the discovery learning* model and students who are taught with the guided inquiry learning model. 3) The third hypothesis test of the significance value for low learning motivation as low learning as low learning = F_{hitung} 4.701 and = 4.149 (). $F_{tabel} F_{hitung} > F_{tabel}$ This shows that H_0 it is rejected and accepted. This means that for students who have low motivation to learn physics, there is a difference between the physics learning outcomes of students taught and H_1 *discovery learning* and students who are taught with a guided inquiry learning model. and students who are taught with a guided inquiry learning model. 4) Testing the fourth hypothesis of the interaction effect with the source of the variance of the learning model and the motivation to learn physics resulted in F_{hitung} = 2.692 and = 4.149 (). $F_{tabel} F_{hitung} < F_{tabel}$ This shows that H_0 it is accepted and rejected which means that there is no interaction between the learning model and learning motivation on the learning outcomes of students' physics. There was no interaction between the learning model and students' motivation to learn physics on physics learning outcomes. H_1

ACKNOWLEDGMENTS

The researcher would like to thank the supervisor who guided him in preparing the article, the PHYSICS teacher who allowed him to carry out research in the class he taught, as well as the class XI students of SMA Negeri 1Woha. who have participated in collecting research data.

REFERENCES

1) Akanmu, M.A., & Olobusuyi, F.M. 2013. Guided discovery learning strategy and senior school students performance in physics in Ejigbo, Nigeria. Journal of Education and Practice.
2) Ali. M.S & Khaeruddin. 2012. Evaluasi Pembelajaran. Makassar: Badan Penerbit UNM.
3) Amanda, N. W. Y. 2014. The Influence of the Discovery Learning Model
4) Nursamsu & Baihaqi. 2016. Implementation of the 2013 Curriculum for Teachers of Aceh Tamiang State High School. Journal of Physics Education, 5 (3), 193-199.
5) Roestiyah. 2008. Teaching and Learning Strategies. Jakarta: Rineka Cipta.
6) Sugiono. 2017. Qualitative and R&D Quantitative Research Methods. Bandung: Alfabeta.
7) Syah, M. 2015. Psikologi Belajar. Jakarta: Bumi Aksara.
8) Timothy, D. 2020. Motivation for Work. Yogyakarta: CV Budi Utama.
9) Wahyudin, D., Rusman, & Rahmawati, Y. 2017. Penguatan Life Skill dalam Implementasi Kurikulum 2013 pada SMA di Jawa Barat. Mimbar Pendidikan: Jurnal Indonesia untuk Kajian Pendidikan, 2 (1), 65-80.