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Implementation of the Project Based Learning (PJBL) to Increase Students Learning Interest and Learning Outcomes in Biotechnology Concept

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Abstract: The success of learning can be influenced by various factors including students learning interests. However, there are still many students who have a low interest in learning, and the interest in learning that is owned by students can affect the learning outcomes of students during the learning process. This study aims to determine the increase in learning interest and student learning outcomes in biotechnology material. The research method used is the class action research method (CAR). The subjects in this study were all students in class IX B of junior high school 1 Baregbeg totalling 35 people with details on 17 boys and 18 girls. The data analysis technique used in quantitative descriptive research allowed the data obtained from the results of the research to be processed with the help of Microsoft Excel 2016 to find out the proportions of student interest in learning, the proportion of interest in learning each cycle, and the proportion of completeness of student learning outcomes on the cognitive aspect. Based on the results of the research it shows that the Project Based Learning (PJBL) model can increase student interest in learning and learning outcomes of students in biotechnology concept with an interest in learning in cycle I obtaining a proportion of 67% and in cycle II of 77%. Then the learning outcomes of students in cycle I were 49% mastery and in cycle II they increased to 91%. Therefore, with the proportion that has increased in cycle II the Project Based Learning (PJBL) model is very effective to be applied in the learning process as an effort to increase interest in learning and student learning outcomes in biotechnology concept in class IX.

Keywords: learning interest, learning outcomes, biotechnology concept, project based learning (PJBL)

INTRODUCTION

Education is a process that must be undertaken by the whole society. With education, an individual can be directed to achieve his goals. Then, with education, an individual can obtain various knowledge and various kinds of skills for his future. Education is inseparable from the learning process. Learning is an obligation for every individual. By learning, an individual can learn from what previously could not be armed with the knowledge obtained or possessed. According to Prayitno (Kusnawan, 2021) learning is an effort to learn new things and for the effort obtained from learning activities. Learning is not only carried out in the family environment, but one of the learning activities can be carried out in schools, with the learning process guided by teachers in schools. With the learning process carried out in schools, an individual not only gains knowledge but can also learn about how to behave or have a good attitude.

The learning process is usually carried out within the scope of learning in the classroom or outside the classroom. An effective and efficient learning process can be created by the teacher so that students can obtain learning according to their characteristics and abilities. According to (Putri & Adirakasiwi, 2021) learning is a process of learning activities where the teacher acts as a facilitator and students as subjects to achieve certain goals, and through learning, students can develop their potential. When implementing an effective learning process so that learning objectives can be achieved, one of the successes of the learning process can be influenced by students' learning interests.

Interest in learning is a desire or willingness to learn that arises from within an individual or student. According to Tanjung (s a desire or willingness to learn that arises from within an individual or student. According to (Tanjung, 2022) interest in learning is an aspect of a person's psychology, such as the desire and feelings of liking to carry out the process of changing behavior through various activities. Interest in learning can foster the enthusiasm of students to study at school or at home. With an interest in learning, the learning process in schools can run effectively because students can be actively involved in the learning process. Learning interests owned by students can affect their learning outcomes. High student learning interest is followed by high student learning outcomes this shows a positive relationship between learning interest and student learning outcomes (Tiwow et al., 2022).

Learning outcomes are achievements obtained by students in the learning process, for example, in the aspect of knowledge or cognitive abilities of students. Learning outcomes of students in cognitive ability can be measured using the cognitive domain of Bloom's taxonomy, which is used as a reference to determine the level of ability of students from their learning outcomes and the achievement of learning objectives. According to (Bloom et al., 1956) learning outcomes are divided into three domains: the domain of knowledge (cognitive domain), the domain of attitudes (affective domain), and the realm of skills (psychomotor domain).

Based on the results of observations through a questionnaire given to students, which was carried out on February 7, 2023 data and information were obtained that during the implementation of learning, students seemed less enthusiastic about learning; for example, students preferred to sit at the back when studying in class. Students had a less happy feeling when learning because they did not like being asked to express their opinions in front of the class. So that the role of the teacher is very important to encourage and foster students learning interests so that students have the desire to study independently and student learning outcomes can increase. Based on the results of observations made prior to the implementation of the research, it was found that the learning outcomes of students were still low, as evidenced by the data obtained from the test results, which showed that only a few students had achieved the minimum completeness criteria. Based on this, it can be assumed that students learning interest is still low, so it is suspected that students learning interest can affect student learning outcomes. One of the efforts to increase students interest and learning outcomes is by applying appropriate learning models to the learning process in the classroom.

The learning model is a systematic step that must exist in the implementation of learning so that the learning process goes according to the learning implementation plan. There are many learning models that can be used in the learning process in the classroom, such as the Discovery Learning (DL) model, Problem Based learning (PBL), and other learning models. One of the innovative and student-centered learning models is the project-based learning (PJBL) model. In accordance with 21st century learning, this learning model includes a learning model in which there are higher-order thinking skills (HOTS). According to Brookhart (Nurlaela et al., 2021) HOTS abilities that must be mastered include understanding science by formulating concept that can produce new understandings, solving problems by identifying problems and solving problems using strategies, as well as the ability to think critically. This PJBL learning model is a learning model that presents problems that are solved on a project basis so that the application of this learning model is adjusted to the basic competence of the concept. One of the science material that supports project implementation is biotechnology concept. So that in biotechnology concept it is appropriate to apply the Project Based Learning (PJBL) learning model, this is in accordance with the basic competencies in biotechnology concept, namely that students are required to present a conventional biotechnology product.

From the various descriptions that have been presented, it can be concluded that the Project Based Learning (PJBL) learning model can be applied in the learning process as an effort to increase student interest and learning outcomes, especially in science subjects, namely biotechnology concept. This biotechnology concept has the potential to be applied to the project-based learning model because biotechnology concept requires students to make a product, so the implementation of learning must be carried out on a project basis. So that this biotechnology material is considered appropriate for measuring students' interest in learning and learning outcomes.

The implementation of the variables in this study can be reflected through research that has been conducted on biology subjects by (Hamidah & Citra, 2021) stating that the project-based learning (PJBL) learning model is effective in increasing learning interest and student learning outcomes in biology subjects in senior high schools and that students are more active in developing and practicing skills. So it is hoped that with the implementation of appropriate learning models using various methods, students interest and learning outcomes can increase. This should be further investigated to find out how much the interest and learning outcomes of students have increased through the application of the project based learning model to the biotechnology concept.

METHOD

The research method used in this study is the Classroom Action Research (CAR) method. According to (Lodico et al., 2006) classroom action research (CAR) is research that is oriented towards improving the scope of education. The research is carried out by teachers and other stakeholders in the school environment with the aim of improving the quality of teaching and the success of students in their studies. Then according to (Abdillah et al., 2021) action research is a process of solving problems practically through the application of the scientific method, which involves the collaboration and cooperation of all stakeholders. The research was conducted in February 2023 at Baregbeg 1 Junior High School. The subjects of this study are IX B students at Baregbeg 1 Junior High School for the 2022/2023 academic year, with a total of 35 students. This classroom action research was conducted in two cycles using the classroom action research model developed by Kemmis and McTaggart. Each cycle consists of four stages of activity: the planning stage, the action stage, the observing stage, and the reflection stage. The classroom action research model used can be seen in Figure 1.

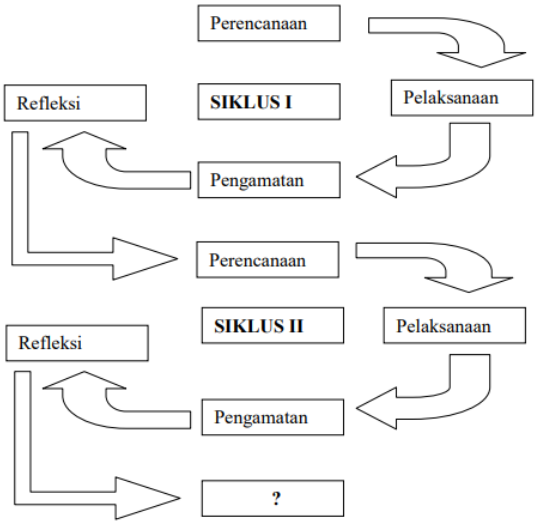

Figure 1. Classroom Action Research Model

Source: (Arikunto et al., 2020)

The instrument used in this research is an instrument for measuring interest in learning by using a questionnaire consisting of 20 statement items adapted from (Putra, 2021). The instrument of interest in learning is arranged based on aspects (Slameto, 2018) namely feelings of pleasure, involvement in learning, student interest, and attention to learning. Then the instrument for measuring learning outcomes in the cognitive aspect uses multiple choice questions on biotechnology material with a total of 10 questions, the instrument for learning outcomes is made based on learning objectives that refer to the basic competencies of the biotechnology concept.

The data analysis technique used in this study is descriptive quantitative. The data was processed with the help of Microsoft Excel 2016 to determine the percentage of each students learning interest, the percentage of interest in learning each cycle, and the percentage of completeness of student learning outcomes on the cognitive aspect. Indicators of the completeness of students learning outcomes can be seen based on the Minimum Completeness Criteria (KKM) in science subjects namely a minimum score of 80. To find out the percentage of interest in learning from each student, the criteria for learning interest can be used in Table 1.

Table 1. Criteria for the Percentage of Interest in Learning

Percentage (%)	Criteria
76-100	High
56-75	Medium
0-55	Low

Source: Arikunto (Septiani et al., 2020)

RESULT AND DISCUSSION

Based on the results of the research that was carried out in class IX B of junior high school 1 Baregbeg, scores of learning interest and student learning outcomes were obtained in cycle I and cycle II. Learning interest instruments were given to 35 students. Students interest in learning was measured using positive and negative statement items totaling 20 statement items adapted from research (Putra, 2021). The learning outcomes measured in this study were learning outcomes on cognitive abilities. Learning outcomes instruments were given to 35 students. Student learning outcomes were measured using multiple choice questions totaling 10 questions that were made based on learning objectives and referred to the basic competencies of biotechnology concept as well as questions made based on the cognitive domain.

To find out the level of student interest in learning, it can be seen based on the percentages of high, medium, and low categories and the percentage level of student interest in learning from each cycle. Students interest in learning the

biotechnology concept using the project-based learning (PJBL) model in cycles I and II can be seen in Table 2.

Table 2. Learning Interests of Students in Cycle I and Cycle II

No	Learning Interest Criteria	Cycle I		Cycle II	
		Amount Student	Percentage	Amount Student	Percentage
1.	High	12	34%	21	60%
2.	Medium	21	60%	14	40%
3.	Low	2	6%	0	0%
Learning Interest Percentage		67%		77%	
Enhancement Cycle		10%			

Table 2 presents the learning interests of students in cycle I and cycle II as obtained from 35 students in class. Based on the table, it shows that in the first cycle, students have a high category of interest in learning by obtaining a percentage of 34% for a total of 12 students, while in the second cycle, students have a high category of interest in learning with a percentage of 60% for a total of 21 students. Then some students in cycles I and II have an interest in learning in the medium category with a percentage of 60% with a total of 21 students in cycle I and 40% in cycle II with a total of 14 students, and in the low category only in cycle I have an interest in learning with a percentage of 6%.

The more detailed explanation for the percentage of each category of interest in learning and the percentage of increasing interest in learning from cycle I to cycle II is explained in the discussion below. The percentage of categories or criteria for students' learning interests can be seen in Figure 2.

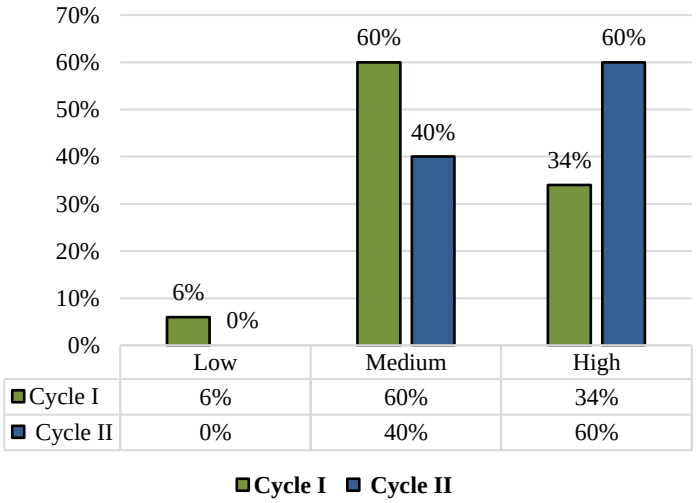

Figure 2. Percentage Diagram of Learning Interest Criteria Cycle I and Cycle II

Figure 2 shows the percentage of students learning interest criteria in cycle I and cycle II, while the criteria used to determine learning interest in each student are with low, medium, and high learning interest criteria. On the criteria of interest in learning with low criteria, cycle I got 6% and cycle II 0%. With a reduced percentage, this shows that students already have an interest or desire to learn and follow the learning process in class to study biotechnology concept.

On the criteria of moderate learning interest, cycle I obtained 60% of students with moderate learning interest criteria and in cycle II it became 40%. With the reduced percentage of the medium criteria in cycle I, this shows that students who previously had a low interest in learning some of whom already have an interest in learning with moderate criteria in cycle II, show an increase towards the criteria of high learning interest and it can be assumed that some students who have low criteria begin to have interest and enthusiasm to study biotechnology concept in cycle II.

In the criteria of learning interest with high criteria, there was an increase in the percentage from cycle I to cycle II, namely 34% to 60%. This shows that the interest of students in the learning process using the Project Based Learning (PJBL) learning model from cycle I to cycle II has increased. There is an increase in students learning interest because the teacher always provides motivation to students before carrying out learning and the teacher provides teaching materials that are easily accessible to students on mobile phones namely in the form of biotechnology material e-modules, as well as with the presentation of each group on project assignments that have been carried out after learning in cycle I namely students presenting the results of conventional biotechnology products in the food sector in the form of cassava tape products, so that the learning atmosphere becomes fun and students from each group evaluate their experiences after carrying out the project.

Then, the percentage increase in student interest in learning from cycle I to cycle II can be seen in Figure 3.

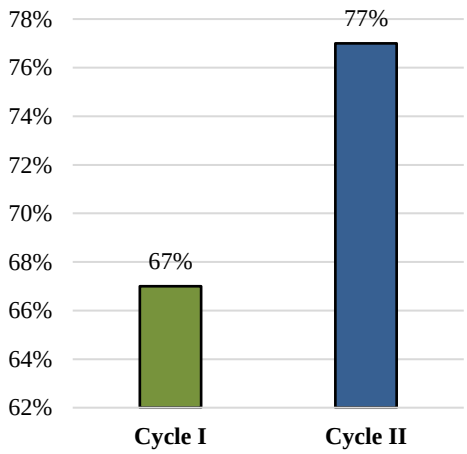

Figure 3. A Percentage Diagram of Increasing Interest in Learning Cycle I and Cycle II

Figure 3 presents the percentage increase in students learning interest in the learning process from cycle I to cycle II by applying the Project Based Learning (PJBL) model in biotechnology concept. The percentage of student interest in learning as a whole from 35 students in cycle I reached 67% and in cycle II it reached 77%. This shows an increase in student interest in learning through the application of Project Based Learning (PJBL). This is in accordance with research conducted by (Yuliana et al., 2022) that found that in learning Indonesian through the application of the project based learning model, there is an increase in each cycle namely in cycle I, the average percentage of students interest in learning is 74,25% which is included in the good category and in cycle II the percentage of students learning interest of 88,78% is included in very good. Based on the percentage diagram showing that the increase in students learning interest from learning cycle I to cycle II experienced an increase in learning interest of 10%, it can be assumed that the project-based learning model is effective for increasing students learning interest because this learning model involves students actively in classroom learning.

Therefore, implementation the PJBL learning model, which is centered on students and students being actively involved in learning, especially in completing projects this can be one of the factors that increases student interest in learning. This is supported by the statement (Sucipto, 2017) that the application of the PJBL learning model in each cycle has increased, as evidenced by the enthusiasm of students to learn and the increased activity of students in class. Then, in line with the statement (Yuniharto & Rochmiyati, 2022) with a high interest in learning and an interactive learning model, one is able to develop collaboration between students and exchange ideas in discussions to exchange ideas in completing projects.

To find out the learning outcomes of students in the cognitive aspect on biotechnology concept, it can be seen based on the percentage of completeness of learning outcomes in each cycle and the percentage of improvement in learning outcomes of students from cycle I to cycle II. Completeness is based on the minimum completeness criteria (KKM) in science subjects applied in school with a score of 80. Student learning outcomes in biotechnology concept using the Project Based Learning (PJBL) model in cycles I and II can be seen in Table 3.

Table 3. Student Learning Outcomes for Cycle I and Cycle II

No	Component Analysis	Learning Outcomes of Cycle I	Learning Outcomes of Cycle II
1.	Average value	73,4	89,7
2.	Minimum value	40	60
3.	Maximum value	100	100
4.	Not completed	51%	9%
5.	Completed	49%	91%

No	Component Analysis	Learning Outcomes of Cycle I	Learning Outcomes of Cycle II
6.	Enhancement of learning outcomes	42%	

Table 3 presents the learning outcomes of students in cycles I and II in biotechnology concept, based on the learning outcomes obtained from 35 students. Based on the table, it shows that the learning outcomes of students in the first cycle obtained an average value of 73,4 and an average score of 89,7 in the second cycle. Then the highest value in each cycle is 100, while the lowest value is 40 for cycle I and 60 for cycle II. Increasing learning outcomes from cycle I to cycle II experienced an increase in learning outcomes of 42%.

As for a more detailed explanation of the percentage of complete learning outcomes and the percentage increase in learning outcomes from cycle I to cycle II, see the discussion below. The percentage of completeness of student learning outcomes in biotechnology concept can be seen in Figure 4.

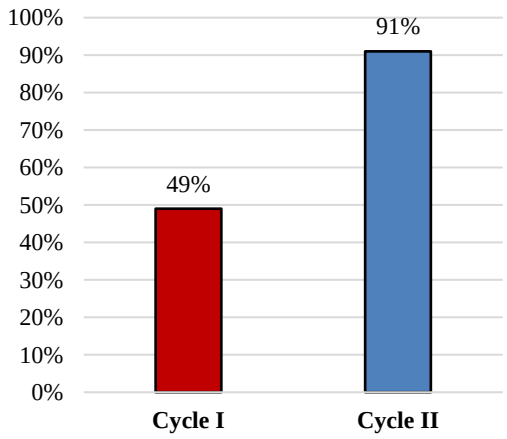

Figure 4. Completeness Percentage of Learning Outcomes for Cycle I and II

Figure 4 presents the percentage of completeness of student learning outcomes on biotechnology concept in cycles I and II. Based on the diagram, it shows that the percentage of completeness of student learning outcomes in cycle I was 49% and in cycle II the completeness of learning outcomes reached 91%, indicating an increase in student learning outcomes in biotechnology concept by 42%.

The results of the research indicate that there is an increase in student learning outcomes in biotechnology concept through the application of the Project Based Learning (PJBL) model and the scientific method. The PJBL learning model is a project-based learning model where in the learning process students are required to actively complete the planned project so that they can present a product. This is supported by the statement (Sunardin, 2019) that

project based learning can be viewed as a learning environment approach that can encourage students to construct their knowledge and skills personally. In the learning process of cycle I, students plan projects to make conventional biotechnology products, and when the learning process takes place, the teacher provides learning media in the form of learning videos about examples of making conventional biotechnology products. To find out the learning outcomes of students, a post-test was carried out at the end of the first cycle of learning and the second cycle. In cycle I, mastery of learning outcomes reached 49%, with a total of 17 students who achieved completeness of learning outcomes with a score of ≥ 80. The percentage of students with complete learning outcomes increased to 91% in learning cycle II with a total of 32 students achieving completeness. This is because in the learning process in cycle II, students are given learning e-modules that can be accessed via mobile phones as additional teaching concept to understand biotechnology concept and in cycle II learning students have completed their projects in making food biotechnology products so students can test the products and convey their learning experiences while completing the project. So that in cycle II there was an increase in student learning outcomes. Learning with the project-based learning model has an impact on learning effectiveness this can be seen in the increase in the value of each student based on the percentage of completeness in learning the recorder fingering technique (Kusnawan, 2021). Then this is supported by the statemen (Attalina, 2020) that the application of the project-based learning model can improve learning outcomes in both cognitive, affective, and psychomotor aspects of elementary citizenship education learning subjects at the tertiary level; this is evidenced by each increase in the percentage of completeness in learning outcomes.

There is an increase in student learning outcomes from cycle I to cycle II implementation the Project Basic Learning (PJBL) model to biotechnology concept this shows that the PJBL model can improve student learning outcomes. This PJBL learning model can improve learning outcomes because in the learning process students are required to be actively involved (student centered). In addition, this PJBL learning model also trains students creativity to make a product and increases students understanding of biotechnology concept. This is in accordance with research conducted by (Sucipto, 2017) that shows the Project Basic Learning (PJBL) model can improve student learning outcomes in each cycle this can be seen when learning takes place. Students can answer questions given by the teacher and participate fully during the learning process because in this model students are required to be able to construct knowledge and try to find alternative solutions to problems.

Based on the presentation in the discussion, it can be concluded that the Project Based Learning (PJBL) model can increase interest in learning and student learning outcomes in biotechnology concept. This is supported research conducted by (Irfana et al., 2022) that shows the application of the PJBL learning model can increase student interest and learning outcomes in the cognitive aspect and shows that the PJBL learning model is effective in increasing student interest and learning outcomes.

CONCLUSION

Based on the results of classroom action research that has been carried out for two cycles and an analysis of the data obtained, it can be concluded that the Project Based Learning (PJBL) model can increase learning interest and student learning outcomes in biotechnology concept, as evidenced by an increase in interest in student learning and student learning outcomes on biotechnology concept after carrying out learning in cycle I and cycle II. Student learning interest obtained a percentage of 67% in learning cycle I and became 77% in learning cycle II. Then there was an increase in student learning outcomes from 49% in cycle I to 91% in cycle II. With the data obtained from the research results, the Project Based Learning (PJBL) model is very effective for increasing interest in learning and student learning outcomes in biotechnology concept in class IX.

REFERENCES

Abdillah, L. A., Fauziah, A., Napitupulu, D. S., Sulistiyo, H., Fitriyanti, Sakti, B. P., Khusnia, A. N., Noveni, N. A., Tarjo, Suwarno, Chamidah, D., Puri, V. G. S., Salma, I., & Nurkanti, M. (2021). *Penelitian Tindakan Kelas: Teori dan Penerapannya* (A. H. Prasetyo (ed.)). Adab.

Arikunto, S., Suhardjono, & Supardi. (2020). *Penelitian Tindakan Kelas*. PT Bumi Aksara.

Attalina, S. N. C. (2020). Penerapan Model Pembelajaran "Project Based Learning" Pada Mata Kuliah Pembelajaran Pendidikan Kewarganegaraan Sekolah Dasar Di Unisnu Jepara. *Refleksi Edukatika : Jurnal Ilmiah Kependidikan*, *10*(2), 267–274. https://doi.org/10.24176/re.v10i2.4705.

Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (1956). *Taxonomy of Educational Objectives The Classification of Educational Goals*. David McKay.

Hamidah, I., & Citra, S. Y. (2021). Efektivitas Model Pembelajaran Project Based Learning (PjBL) terhadap Minat dan Hasil Belajar Siswa. *BIOEDUSAINS:Jurnal Pendidikan Biologi Dan Sains*, *4*(2), 307–314. https://doi.org/10.31539/bioedusains.v4i2.2870.

Irfana, S., Attalina, S. N. C., & Widiyono, A. (2022). Efektifitas Model Pembelajaran Project Based Learning (Pjbl) dalam Meningkatkan Minat Dan Hasil Belajar Siswa di Sekolah Dasar. *Journal of Professional Elementary Education*, *1*(1), 56–64. https://doi.org/10.46306/jpee.v1i1.8.

Kusnawan, H. (2021). Upaya Meningkatkan Hasil Belajar Seni Budaya Siswa Kelas IX melalui Model Project Based Learning. *Jurnal Pendidikan Indonesia Gemilang*, *1*(1), 7–12. https://doi.org/10.53889/jpig.v1i1.18.

Lodico, M. G., Spaulding, D. T., & Voegtle, K. H. (2006). *Methods In Educational Research*. Jossey-Bass.

Nurlaela, E., Mustofa, R. F., & Ardiansyah, R. (2021). Hubungan Self Confidence Dengan Kemampuan Berpikir Kritis Peserta Didik Pada Materi Sistem Respirasi. *Jurnal Bioterdidik: Wahana Ekspresi Ilmiah*, *9*(2), 77–84. https://doi.org/10.23960/jbt.v9i2.22850.

Putra, I. M. A. A. (2021). *Korelasi Antara Minat Belajar dan Tipe Kepribadian Terhadap Prestasi Belajar Fisika Siswa Kelas X MIPA SMA Negeri di Kota Negara*. Universitas Pendidikan Ganesha.

Putri, Y. P., & Adirakasiwi, A. G. (2021). Analisis Minat Belajar Siswa Kelas X SMA At-Taubah pada Materi SLPTV dengan Metode Pembelajaran Daring. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *5*(3), 2934–2940. https://doi.org/10.31004/cendekia.v5i3.987.

Septiani, I., Lesmono, A. D., & Harimukti, A. (2020). Analisis Minat Belajar Siswa Menggunakan Model Problem Based Learning Dengan Pendekatan Stem Pada Materi Vektor Di Kelas X MIPA 3 SMAN 2 Jember. *Jurnal Pembelajaran Fisika*, *9*(2), 64–70. https://doi.org/10.19184/jpf.v9i1.17969.

Slameto. (2018). *Belajar dan Faktor-faktor yang Mempengaruhi*. Rineka Cipta.

Sucipto, H. (2017). Penerapan Model Project Based Learning untuk Meningkatkan Minat dan Hasil Belajar IPS. *Jurnal Pendidikan : Riset & Konseptual*, *1*(1), 77–86. https://doi.org/https://doi.org/10.28926/riset_konseptual.v1i1.10.

Sunardin, S. (2019). Peningkatan Hasil Belajar Siswa Pada Pembelajaran IPS melalui Penerapan Model Project Based Learning. *Indonesian Journal of Educational Studies*, *21*(2), 116–122. https://doi.org/10.26858/ijes.v21i2.8641.

Tanjung, Y. P. (2022). Hubungan Minat Belajar dan Motivasi Belajar dengan Hasil Belajar Matematika Pada Siswa Kelas V Di Mis Nurul Hikmah Ujung Padang. *Pionir: Jurnal Pendidikan*, *11*(1), 102–119. https://doi.org/10.22373/pjp.v11i1.13108.

Tiwow, D., Wongkar, V., Mangelep, N. O., & Lomban, E. A. (2022). Pengaruh Media Pembelajaran Animasi Powtoon Terhadap Hasil Belajar Ditinjau dari Minat Belajar Peserta Didik. *Journal Focus Action of Research Mathematic (Factor M)*, *4*(2), 107–122. https://doi.org/10.30762/factor_m.v4i2.4219.

Yuliana, M., Ahmad, J., & Hidayati, Y. M. (2022). Peningkatan Minat Belajar Bahasa Indonesia Melalui Model Pembelajaran Project Based Learning Pada Siswa Kelas III Sekolah Dasar. *Educatif: Journal of Education Research*, *4*(3), 154–160. https://doi.org/10.36654/educatif.v4i3.216.

Yuniharto, B. S., & Rochmiyati, S. (2022). Peningkatan Minat Belajar dan Kreativitas Melalui Project Based Learning pada Siswa Kelas V SDN Sariharjo. *Autentik: Jurnal Pengembangan Pendidikan Dasar*, *6*(2), 226–235. https://doi.org/https://doi.org/10.36379/autentik.v6i2.225.