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Problem-Based Learning Towards Student's Motivation: An Action Research

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ABSTRACT

Students' learning motivation is still very low, this can be seen when there are still many students who pay less attention to the teacher's explanation, lack enthusiasm when participating in learning, and prefer to chat with other students and play alone in learning. This study aims to increase students' learning motivation in science learning using Problem-Based Learning. This research is a class action research consisting of 2 cycles. The sample in this research amounted to 33 students from one of the junior high schools in Bandung City consisting of 16 male students and 17 female students.. This research instrument is a questionnaire of student learning motivation consisting of 5 indicators, namely intrinsic motivation, career motivation, self-determination, and efficacy of and value motivation with 5 questions for each indicator and a total of 25 questions. Data analysis in this study is a descriptive analysis by comparing the percentage of students' learning motivation results in cycle 1 with cycle 2. Based on the results of data analysis that has been done, the results of student learning motivation in cycle 1 are 65% and in cycle 2 to 70%. Thus, there was an increase of 5% from cycle 1 to cycle 2. So, it can be concluded that the Problem-Based Learning model can increase students' learning motivation in the material of motion and force of science class VII SMP.

Keywords : Problem-Based Learning, Motivation, Action Research, Cycle

I. INTRODUCTION

Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves and society [1]. The purpose of education according to Ki Hadjar Dewantara is to guide all the natures that exist in children so that they can achieve the highest safety and happiness both as humans and members of society. Since the COVID-19 era, the curriculum has changed from the K13 curriculum to the independent curriculum. The concept of an independent curriculum is taken from the philosophical thoughts of Ki Hajar Dewantara, one of which is the among system and leads children to become independent human beings [2].

The independent curriculum is a curriculum with diverse intracurricular learning where content will be optimized so that students have enough time to explore concepts and strengthen competencies [3]. In the independent curriculum, the term independent learning is known, the principle of independent learning emphasizes the need to contribute effectively to improving economic standards for students so that they learn optimally [4]. In addition to changing the curriculum, improvements are also made regarding its components such as improving the quality of teachers and the quality of learning such as updating approaches, models, methods, and media as well as increasing the number of textbooks [5].

Science (Science of Nature) is one of the subjects at the junior high school level with contextual learning that can provide direct learning experiences to students, and lead students to have basic science concepts and apply them in everyday life [6]. Therefore, Indrawati, et al [7] stated that it is necessary to present creative, innovative, and fun learning so that science learning is not monotonous and that it can increase students' interest in being able to actively discover the concepts, principles, theories, and facts of science. However, in reality, teachers are still often fixated on achieving the target of completing the material presented to students, without following science learning according to the independent curriculum which pays attention to the process and meaningful understanding of the learning.

Based on observations made by researchers in one of the schools, it was found that the motivation of students to learn was still very low, this was seen when there were still many students who paid less attention to the teacher's explanation and preferred to chat with other students and play alone in learning. In addition, it is also seen that the enthusiasm for learning of students is still relatively low, such as the lack of enthusiasm and competitiveness of students when responding to questions given by the teacher, so students tend to be passive and unmotivated during learning. Learning motivation is an energy or drive in a person characterized by the emergence of feelings, reactions, and responses to something. Thus, motivation in the learning process is needed as an initial stage to encourage the material to be learned [8].

Low learning motivation can occur because of the way to teach teachers who are boring and can even with monotonous teaching. With such conditions an effort should be made to increase motivation and develop student potential. In the learning process, teachers must use effective and varied learning models so that students show more interest in learning actively in the learning process [9]. Beside that, One of the things that can help increase student motivation is creating learning activities that can actively involve students to find out and build their knowledge the teacher's role is only as a facilitator and motivator, it aims to make students become more independent/skilled and actively gain experience during learning so that student learning motivation can increase [5]. To create learning that involves students actively / learner-centered, teachers must be able to choose the right learning model. One of the learner-centered learning models is the problem-based learning model. Problem-based learning is a learning method where relevant problems are introduced to students early in the teaching cycle and used to provide context and motivation for subsequent learning [10]. In line with that, the Problem-Based Learning model is a learning model that emphasizes more on the activities of students looking for solutions and can solve problems in real life [11]. The Problem-Based Learning model focuses on problems where learners can build their knowledge, develop inquiry skills, and think at a high level. Learners can be able to formulate temporary answers to a problem that requires logical intelligence, courage, and active solutions in real situations [12]. In addition, according to Kemdikbud [13], Problem-Based Learning is a learning model that presents contextual problems to stimulate students to learn in groups to solve problems from real-world problems and bind students to curiosity about learning, so that they have their learning model. The Problem-Based Learning model is also a learning model that provides authentic experiences that encourage learners to learn actively, construct knowledge, and integrate the context of learning at school and learning in real life naturally [14].

Problem-based learning motivates learners more than traditional teaching methods. Students are more motivated in this learning because of the problems that must be solved and students are more active in participating in all learning steps during the learning process [15]. Compared to conventional learning, the Problem-Based Learning learning model has many advantages including being able to prepare students to face problems in real-world situations, producing students who can construct their knowledge, and helping students develop communication, reasoning, and critical thinking skills. This is because, in the learning process with this method, the teacher acts as a guide and facilitator who directs students. Students work in groups and ask, answer, criticize, correct, and clarify any concepts or arguments that arise in the discussion [16]. Therefore, the Problem-Based Learning model can improve the teaching and learning process because it focuses more on developing students as independent learners compared to conventional learning which only encourages students to be fed/centered on the teacher [17]. The syntax of PBL are, 1) Problem orientation, explaining learning objectives, explaining the logistics required, motivating students to carry out problem-solving activities, and proposing problems. 2) Organizing students to learn, students are divided into groups, helping students determine and organize learning tasks related to the problem. 3) Guiding individual and group investigations. learners gather appropriate information, conduct experiments and investigations to obtain explanations, and solve problems. 4) Developing and presenting work. Learners plan and prepare appropriate work. 5) Analyzing and evaluating the problem-solving process, learners reflect on or evaluate their investigations and the processes they use [18].

Based on the results of observations made on October 3 and 10, 2023, several problems arise when implementing learning activities, namely, the low activeness of students in science learning activities, inappropriate learning methods, and media used so that students look easily bored and easily influenced by other things, which has an impact on students having difficulty in following lessons so that it also has an impact on students' learning motivation which is not as good as other subjects. So, based on this description, the author is

interested in conducting research with the title "Implementation of Problem-Based Learning to Increase Students' Learning Motivation: A Classroom Action Research". Previous research used a learning motivation instrument in the form of a learning motivation questionnaire developed by the researchers themselves which consisted of 2 categories, namely extrinsic and intrinsic with a total of 20 questions and an observation sheet [15]. However, this study uses a student learning motivation questionnaire translated through a student learning motivation questionnaire written by Hye Sun You, Kyungun Kim, Karynne Black, and Kyung Woo Min which consists of 5 categories namely intrinsic motivation, career motivation, self-determination, self-efficacy, and value motivation, each category consists of 5 questions so that the total number of questions in the questionnaire is 25 questions. The contribution of this research can add new knowledge about Problem-Based Learning to student learning motivation through class action research. This study aims to determine the effect of the Problem-Based Learning learning model on student learning motivation on the material of motion and force in grade 7 junior high school.

II. METHOD

a. Research Design

The type of research used in this study is classroom action research (PTK). This research consists of 2 cycles, each cycle consists of 4 steps, namely:

1. Planning; At this stage, the researcher prepares the syllabus, makes lesson plans, and research instruments for motion material in cycle 1 and force material in cycle 2.
2. Action: At this stage, carry out learning by applying the Problem-Based Learning learning model using the syntax proposed by Arend on motion material for cycle 1 and force material for cycle 2.
3. Observation: Observations were made by observers from fellow teachers.
4. Reflection: At this stage, the teacher and the observer discuss the actions that have been taken. What things need to be improved in the next lesson and whether it has achieved the intended goals. Based on Figure 1, the research design was carried out in Cycle 1 and Cycle 2 [19].

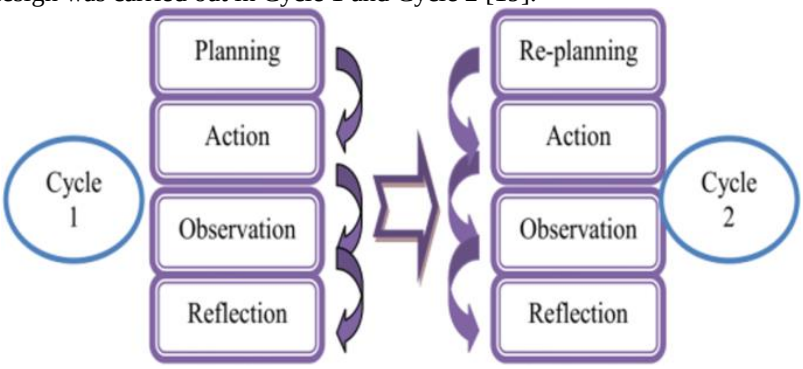

Fig 1. Research Design

b. Participants

This research was conducted in one of the schools in Bandung in the 2023/2024 school year, namely from October to November. The population of this study was all seventh-grade students in one of the schools in Bandung in the 2023/2024 school year and the sample in this study was seventh-grade students totaling 33 students consisting of 16 male students and 17 female students. The age of the learners is around 12-13 years old. The distribution of participants based on gender, the number of learners, and the percentage can be seen in Table 1 which shows the distribution of participants.

Table 1. Participation Distribution

Gender	Number of Students	Percentage
Male	16	48.50%
Female	17	51.50%
Total	33	100 %

c. Research Instrument

The method used for data collection is by giving a questionnaire on student learning motivation. The learning motivation lift was given after the implementation of cycle 1, namely after the motion material was completed, and after the end of the implementation of cycle 2, namely after the material of Newton's force and law. The instrument used in this study is a questionnaire on student learning motivation [20]. This learning motivation questionnaire consists of 5 indicators, namely intrinsic motivation, career motivation, self-

determination, and efficacy of and value motivation with 5 questions for each indicator and a total of 25 questions. The questionnaire on student learning motivation is in the form of a questionnaire with a closed answer type using a Likert scale (0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Often, 4 always).

Cronbach alpha reliability of the science learning motivation questionnaire shows the suitability of internal consistency. The intrinsic motivation indicator shows that the accepted level of reliability is 0.89, the career motivation indicator shows that the accepted level of reliability is 0.93, the self-determination indicator shows that the accepted level of reliability is 0.85, the self-efficacy indicator shows that the accepted level of reliability is 0.90, and the value motivation indicator shows that the accepted level of reliability is 0.83. Based on the Cronbach alpha score, the science learning motivation questionnaire is in the valid and reliable category.

d. Data Analysis

The data analysis technique that will be used is the descriptive analysis technique. The results of the questionnaire will be analyzed by calculating the percentage of motivation of students based on indicators of learning motivation and then the results of the percentage of learning motivation of students in cycle 1 compared to the results of the percentage of learning motivation of students in cycle 2. The way to calculate the percentage is as shown in equation 1:

$$\text{Percentage} = \frac{Number\ of\ Score}{Maximum\ Number\ of\ Score}\ x\ 100\% \quad (1)$$

The range of categories of student learning motivation is shown in Table 2.

Table 2. Percentage Categories of Science Learning Motivation Results

Percentage Range of Learning Motivation Result (%)	Category
81 – 100	Very High
61 – 80	High
41 – 60	High Enough
21 – 40	Less High
0 - 20	Very Low

III. RESULTS AND DISCUSSION

The data on the results of student learning motivation used in this study are learning motivation data obtained from the results of distributing questionnaires on student learning motivation consisting of 5 categories with a total of 25 questions conducted after the application of the Problem-Based Learning learning model in grade 7 in one of the junior high schools in Bandung for motion material in cycle 1 obtained a percentage of student learning motivation of 65% and the application of the Problem-Based Learning learning model on force material in cycle 2 and obtained a percentage of student learning motivation of 70%. Percentage Results of Learner Motivation can be seen in Figure 2.

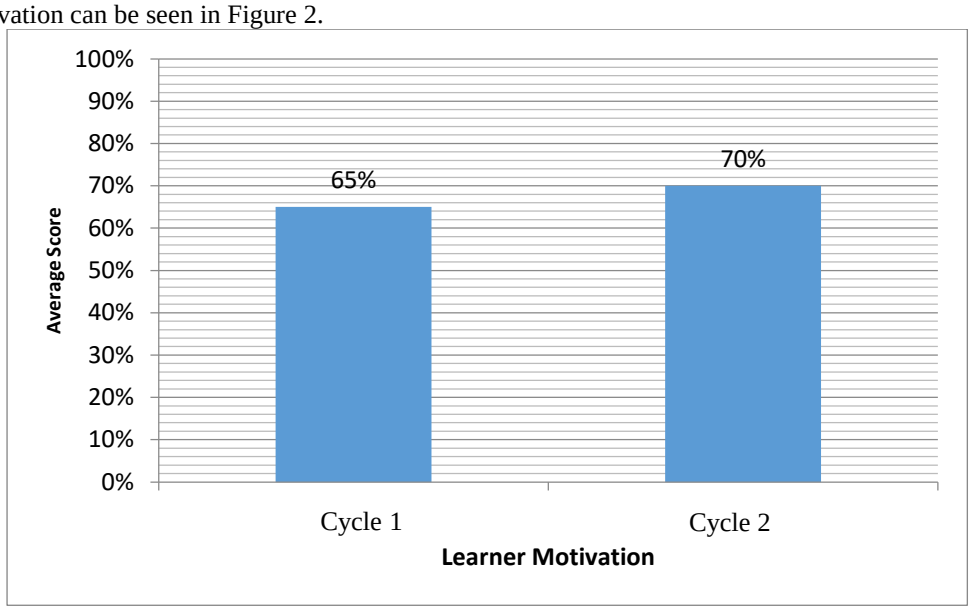

Fig 2. Percentage of Learner's Motivation

The learning motivation of students in cycle 1 and cycle 2 has increased as shown in Figure 2. The learning motivation of students in class 7 consisting of 33 students in cycle 1 of 65% increased to 70% in cycle 2, so it is

said to have increased by 5%. In cycle 1 students applied the Problem-Based Learning model for motion material and in cycle 1 students applied the Problem-Based Learning model for force material.

Students learning motivation on Motion and Force material is analyzed by calculating the percentage of students' motivation based on learning motivation indicators using equation 3.1. Based on the data on students' learning motivation obtained, the percentage of students' learning motivation for each indicator on Motion and Force material in Cycle 1 and Cycle 2 can be seen in Table 3.

Table 3. Learners Learning Motivation for Each Indicator

Assessment Aspect	Cycle 1	Category	Cycle 2	Category
Intrinsic Motivation	62 %	High	64%	High
Career Motivation	58%	High Enough	68%	High
Self- Determination	65%	High	68%	High
Self- Efficacy	66%	High	68%	High
Grade Motivation	73%	High	80%	High
Total	65%	High	70%	High

Based on the results of the analysis in Table 3, it can be seen that student learning motivation has increased for each indicator in cycle 2. It can be seen that the highest increase occurred in the "Career Motivation" indicator, namely by 10% from a percentage of 58% in cycle 1 to 68% in cycle 2, while the smallest increase of only 2% occurred in the "Self-Efficacy" and "Intrinsic Motivation" indicators, in cycle 1 obtaining a percentage of 66% increased to 68% and a percentage of 62% in cycle 1 increased to 64% in cycle 2 and the value motivation indicator obtained the largest percentage of 73% in cycle 1 and 80% in cycle 2. In addition, based on the results of the analysis of Table 3, out of 33 students, it was found that most students in cycle 1 fell into the category of very high enough with 16 students, followed by the high category with 13 students, and very high with 4 students. As for cycle 2, most of the students were in the high category as many as 20 students, then the good enough category with a total of 7 students, and a very high category of 6 students.

Based on Table 3, in cycle 1 for "Instructional Motivation" a percentage of 65% was obtained which was in the High category, based on these results out of 33 learners there were 4 learners, 14 learners, 12 learners, and 3 who got the categories less high, quite high, high, and very high, while in cycle 2 there was an increase in percentage by 5% to 70% where out of 33 learners, While in cycle 2 there was an increase in percentage by 5% to 70% where out of 33 learners, initially there were 4 learners with a category of less high decreased to 1 learner, but learners with a high enough category which initially only 14 learners increased to 17 learners and learners with a high category which in cycle 1 amounted to 12 learners decreased to 11 learners, while for the very good category, there was an increase in the number of learners, which in cycle 1 amounted to 3 learners, in cycle 2 increased to 4. Whereas for the indicator "Career Motivation" there was an increase in the percentage of 10% from initially 58% which was in the high enough category in cycle 1 increased to 68% which was in the high category in cycle 2, with details in cycle 1 of 33 learners there were 7, 14, 8, and 4 learners with categories of less high, quite high, high and very high, while in cycle 2 with the number of each category 2, 13, 8, and 10 learners with categories of less high, quite high, high and very high. Furthermore, for the indicator "Self-Determination" there was an increase in the percentage of 3% from initially 65% in cycle 1 to 68% in cycle 2, with details in cycle 1 of 33 students there were 2, 12, 13, and 6 students in the categories of less high, quite high, high and very high, while in cycle 2 with the number of each category 16, 10 and 7 students in the categories quite high, high and very high, while for the category less high none of the students obtained it. Then, for the indicator "Self-Efficacy" there was an increase in percentage of 2% from initially 66% in cycle 1 to 68% in cycle 2, with details in cycle 1 of 33 students there were 2, 10, 15, and 6 students with categories of less high, quite high, high and very high, while in cycle 2 with the number of each category 1, 12, 13, and 7 students with categories of less high, quite high, high and very high. Finally, for the indicator "Value Motivation" there was an increase in the percentage of 7% from initially 73% in cycle 1 increasing to 80% in cycle 2, with details in cycle 1 of 33 students there were 1, 13, 8, and 11 students in the categories of less high, quite high, high and very high, while in cycle 2 with the number of each category 4, 14 and 15 students in the categories quite high, high and very high and none of the students obtained the category less high. Of all the percentages of these categories, the total percentage of student learning motivation in cycle 1 was 65% in the High category and increased by 5% in cycle 2 to 70% which was still in the High category.

The stages of research carried out in cycle 1 begin with planning steps, namely researchers identifying and formulating problems, as well as preparing lesson plans (RPP) along with media and learning resources for the implementation of learning on motion sub-materials. Then the implementation stage, at this stage the researcher begins to apply the problem-based learning model for motion material in accordance with the teaching module that has been made, at this stage, students solve problems in heterogeneous groups through literacy and experimentation activities. This stage of implementation uses PBL syntax which consists of 5 stages, namely problem orientation, organizing students, guiding group investigations, developing and presenting work, and analyzing and evaluating the problem-solving process. 1) At the problem orientation stage, the problem given in cycle 1 is a problem related to displacement and distance, and speed, 2) the stage of organizing students, the author divides students into several groups with group members who are always different at each meeting, 3) the group investigation stage, the author guides and supervises students doing experiments directly and using Phet media and student worksheets given, 4) the stage of developing and presenting the results of the work, students present the results of the student worksheet that has been done, 5) the last stage, analyzing and evaluating the problem-solving process, the teacher gives a formative test in the form of several questions to measure the level of achievement of individual students. Furthermore, the stages of research carried out are the observation stages carried out by two types of observations, namely the learning process of students carried out by researchers, then observing the learning process with the problem-based learning model carried out by peers and subject teachers. Finally, at the reflection stage, self-reflection activities are carried out with students, and then discussions are also held with observers, namely peers and science teachers regarding what has been carried out, both strengths and weaknesses during the implementation of learning using the problem-based learning model. Based on the results of the reflection, the shortcomings are that the problems given by the teacher are still less interesting to discuss the right way used by students to overcome these problems is still monotonous and few, and the ability of researchers to manage the class.

In cycle 2 for the planning stage, researchers made a draft lesson plan that was adjusted to the results of the reflection in cycle 1, improving all the weaknesses/obstacles that occurred, such as the methods used were not limited to group discussions and experiments, but also added to the project method. Furthermore, in the implementation stage, researchers apply the problem-based learning model for force material in accordance with the teaching module that has been made and revised based on the results of reflection on cycle 1, the PBL stages begin with 1) problem orientation, at this stage students solve problems in heterogeneous groups, each group solves problems through literacy activities, 2) the stage of organizing students, the author divides students into groups with group members who are always different at each meeting using roulette, 3) the group investigation stage, the author guides and supervises students working on experiments and student worksheets given, Especially in the sub-material of Newton's law 3, the teacher provides a project to solve the problem, so at this stage the teacher guides and supervises students when working on projects and trying projects that have been made, 4) the stage of developing and presenting work, students present the results of the student worksheet that has been done, Especially for the meeting of Newton's law 3, students in addition to presenting the results of their student worksheets, students also try the tools that have been made, at the last stage for this PBL model, 5) analyzing and evaluating the problem solving process, the teacher's activities provide formative tests in the form of several questions to measure the level of achievement of individual students. Then the third stage in this research is the observation stage which is the process of re-analyzing the learning process that has been passed, reviewing the strengths and weaknesses of the implementation, as a consideration for continuing to the next stage. The last stage is the reflection stage, the researcher together with the students re reflects using a sheet of paper containing feelings, criticisms, and suggestions during the learning process and for peers and teachers to discuss things that have been done during the learning process.

After applying the Problem-Based Learning (PBL) learning model, the results obtained were an increase of only 5%, which in cycle 1 obtained a percentage of 65% which increased to 70% in cycle 2. The increase of only 5% was caused by several things, including that there were still some students who were not really serious about answering the questionnaire on student learning motivation given by the teacher, this was because the cycle 2 questionnaire was given after doing the daily test (UH) of the motion and force chapter which was carried out in the last hour of learning and students were no longer focused on answering the questionnaire because of their desire to go home quickly. In addition, the application of the PBL model still cannot be applied optimally, due to the lack of mastery of the class by the teacher, who feels there is limited time at each meeting and there are still many students who still lack the ability to think critically and the lack of literacy levels of students. So, sometimes learning time is more spent on the explanation process by the teacher when students do not understand. However, based on the results of observations made during learning, it is clear that the learning motivation of students has increased considerably when applying the PBL model in each cycle. This can be seen from the increasing activity of all students when participating in learning, besides that, it can be seen when almost all students always ask the teacher if they do not understand what is being learned. Finally, the learning motivation of students seems to be increasing for each cycle because the learning outcomes of all students such

as practice questions, student worksheets, and daily tests (UH) increase than before applying the PBL model. Problem-based Learning implementation in a traditional curriculum requires more instructor support to encourage the students to invest in the transformation of their learning [21].

Research by Sumitro and Setyosari [22] with the research title "Application of Problem-Based Learning Model Increases Motivation and Learning Outcomes of Ips" found that there was an increase in student motivation in all four aspects with details, in the aspect of attention by 11.28% from 73, 04% in cycle I to 84.32% in cycle II, in the relevance aspect increased by 9.64% from 76.55% in cycle I to 86.19% in cycle II, in the confidence aspect increased by 10.62% from 71.56% in cycle I to 82.18% in cycle II, and in the satisfaction aspect increased by 14.88% from 71.79% in cycle I to 86.67% in cycle II. Besides that, in previous research, it was found that the *problem-based learning* model can increase student learning motivation with an increase of 75% well-endowed in cycle I. increased to 87.5% which was very well-endowed in cycle II [23]. Furthermore, problem-based learning model can influence student learning motivation with the results of t-hit = 14.61> t-table = 1.99, which can be concluded that the use of PBL learning models can increase student motivation in the material of the human digestive system in class eleven MAN Blangpidie [24].

PBL learning can provide opportunities for students to carry out the stages of investigation independently in groups [25]. The application of problem-based learning in physics learning makes students' creativity learners' creativity increase and their attention to problems and the learning provided is very good. Learners will be freer in conveying ideas, thoughts, and opinions, and learners' cooperation looks very good in group work [26]. In the application of the PBL model, students are increasingly motivated to learn because students are dealing directly with the context of problems that are commonly encountered, this is because a person's motivation will tend to increase if it is directly related to the real aspects that occur around him [25]. In addition, according to Suari [5], the PBL learning model will encourage students to think creatively, imaginatively, and reflectively about models and theories, introduce ideas at the right time, try new ideas, and encourage students to gain confidence. This PBL learning model is suitable for application in science subjects because in science learning students are required to be active to think creatively, imaginatively, and with others. In line with that, this Problem-Based Learning model is active learning and is very effective in creating knowledge, and can improve analysis, evaluation, and creation skills which help students to develop skills in identifying problems Students are required to work together in solving problems obtained from their real life which helps increase their learning motivation [27].

In Problem-Based Learning, learners are no longer given lectures or notes but must learn for themselves based on the problem at hand. They will not acquire information if they do not read, explore, or ask for it. They need to work in groups, exchange ideas and opinions, proactively argue for what others think, and be trained to accept failure and mistakes. In addition, in PBL there is no one right answer. Therefore, there is freedom for them to decide on the solution they consider correct [17]. PBL promotes metacognition and self-regulated learning as students generate strategies for problem definition, information gathering, data analysis, and hypothesis building and testing. PBL engages students' learning in ways that are similar to real-world situations and assesses learning in ways that demonstrate understanding and not mere replication. PBL makes students more engaged in learning because they are hard-wired to respond to dissonance and because they feel they are empowered to have an impact on the outcome of the investigation [28]. The Problem-Based Learning model involves the role of students in the learning process. Students are given the freedom to think creatively and actively participate in developing their reasoning in solving problems that exist in everyday life. The advantage of the Problem-Based Learning model is that students learn actively and independently with integrated material presentation relevant to the actual reality, which is often called student center [29]. Problem-Based Learning (PBL) is a pedagogical approach that allows students to be actively involved with problems. *PBL* is an effective teaching and learning approach, especially when evaluated for long-term retention and application of knowledge [30]. Based on the results of the analysis and observations that have been made, it can be said that the application of the Problem-Based Learning (PBL) learning model can increase the learning motivation of students in the material of Motion and Force Science class VII SMP.

IV. CONCLUSION

Based on the results of the research that has been obtained, it can be concluded that the application of the Problem-Based Learning learning model can increase the Learning Motivation of students in the material of Motion and Force Science Class VII SMP. This can be seen from the increase in the percentage of learning motivation for each indicator, namely in intrinsic indicators, there was an increase of 2% which obtained 62% in cycle 1 to 64% in cycle 2, then for career motivation indicators there was an increase of 10% which obtained 58% in cycle 1 to 68% in cycle 2, then for self-determination indicators, there was an increase of 3% which obtained 65% in cycle 1 to 68% in cycle 2, then for self-efficacy indicators, there was an increase of 2% which obtained 66% in cycle 1 to 68% in cycle 2 and finally for value motivation indicators there was an increase of 7% which obtained 73% in cycle 1 to 80% in cycle 2. So the percentage increase for the whole indicator is 5%

which in cycle I obtained 65% which is in the high category and increased in cycle II to 70% which is in the high category.

Suggestions in this study include teachers giving students the freedom to choose their learning resources so that students are advised to diligently read the learning resources that have been chosen to be able to solve the problems given during the learning process and add insight as well. In addition, teachers are advised to always provide a forum for students to develop their potential, such as presentation skills, critical thinking skills, and creative skills, and use various kinds of learning innovations to create interactive, interesting, and fun learning that causes students to feel happy and motivated in learning. Then, for schools, it is recommended to always provide policies that lead to increased learning resources and increased human resources for school residents. Finally, other researchers are advised to conduct research using more complex variables so that problems in the world of education can be minimized.

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REFERENCES

[1] L. Mirnawati, "Pengaruh Model Pembelajaran Kooperatif Tipe Group Investigation terhadap Kreativitas Mahasiswa Semester 1 PGSD UM Surabaya pada Mata Kuliah Pengantar Manajemen Pendidikan," *Pedagogia: Jurnal Pendidikan,* vol. 6, no. 1, pp. 84-97, 2017.

[2] P.M. Efendi, T. Muhtar, Y.T. Herlambang, "Relevansi Kurikulum Merdeka Dengan Konsepsi Ki Hadjar Dewantara: Studi Kritis Dalam Perspektif Filosofis-Pedagogis," *Jurnal Elementaria Edukasia,* vol. *6,* no. 2, pp. 548-561, 2023.

[3] A.T. Purnawanto, "Perencanakan Pembelajaran Bermakna dan Asesmen Kurikulum Merdeka," *Jurnal Ilmiah Pedagogy,* vol. 20, no. 1, pp. 75-94, 2022.

[4] M. Marisa, "Inovasi Kurikulum "Merdeka Belajar" di Era Society 5.0," *Santhet: Jurnal Sejarah, Pendidikan Dan Humaniora,* vol. 5. no. 1, pp. 66-68, 2021.

[5] N.P. Suari, "Penerapan Model Pembelajaran Problem Based Learning untuk Meningkatkan Motivasi Belajar IPA," *Jurnal Ilmiah Sekolah Dasar,* vol. 2, no. 3, pp. 241-247, 2018.

[6] P.J. Sutarto, S. Hariyadi, and I. Wicaksono, "Development of student worksheets based on STEM approach to improve students' critical thinking skills," *Journal of Physics: Conference Series,* 2104(2021), pp. 1-6, 2021.

[7] Indrawati., I.K. Mahardika, J. Prihatin, Supeno., S. Astutik, Sudarti., and I. Wicaksono, "The effect of the group investigation-guided inquiry (GI-GI) learning model to improve students' collaboration and science process skills," *Journal of Physics: Conference Series*, vol. 2104(2021), pp. 1-5, 2021.

[8] L.A. Far'i, M. Fahrurrozi, and Marhamah, "The Effect of The Multimedia-Assisted Problem-Based Learning Model on Student Learning Motivation," *IJE Interdiciplinary Journal of Education*, vol. 1, no. 1, pp. 139-149, 2023.

[9] F.Y. Hermanto, "Improving Student Motivation Using *Problem Based Learning* Models in Science Material," *Journal of Xi'an University of Architecture & Technology,* vol. 12, no. 10, pp. 276-282, 2018.

[10] A.S. Argaw, B.B. Haile, B.T. Ayalew, and S.G. Kuma, "The Effect of *Problem Based Learning* (PBL) Instruction on Students Motivation and Problem Solving Skill of Physics," *EURASIA Journal of Mathematics Science and Technology Education*, vol. 13, no. 3, pp. 857-871, 2016.

[11] S. Meilasari, M. Damris, and U. Yelianti, "Kajian Model Pembelajaran *Problem Based Learning* (PBL) Dalam Pembelajaran Di Sekolah," *Jurnal Pendidikan Biologi dan Sains*, vol. 3, no. 2, pp. 195-207, 2020.

[12] M. Munawaroh, and N.S. Setyani, "The effect of *Problem Based Learning* (PBL) model on student learning motivation inproducts, creative and entrepreneurship subject in Eleventh Grade of SMK PGRI 1 Jombang," *IOP Conf. Series: Journal of Physics: Conf*, Series *1464* (2020), pp. 1-10, 2020,

[13] E. Rahmayanti, "Penerapan *Problem Based Learning* dalam Meningkatkan Kemampuan Berpikir Kritis Peserta Didik pada Pembelajaran Pendidikan Pancasila dan Kewarganegaraan Kelas XI SMA.," *Prosiding Konferensi Nasional Kewarganegaraan III,* vol. 11(2017), pp. 242-248, 2017.

[14] P. Sellavia, N. Rohadi, and D.H. Putri, "Penerapan Model Problem Based Learning Berbasis Laboratorium untuk Meningkatkan Keterampilan Proses Sains Peserta Didik di SMAN 10 Kota Bengkulu," Jurnal Kumparan Indonesia, vol. 1, no. 3, pp. 13-19, 2018.

[15] Y. Fitria, R. Yetti, R. Amini, and R. Eliyasni, " Effectiveness of Problem Based Learning for Improving Motivation and Critical Thinking Skills," International Journal of Innovation, Creativity and Change, vol. 5, no. 4, pp. 300- 316, 2019.

[16] M. I. Hasrawati, and Hajidin, "Improving students' problem-solving ability and learning motivation through Problem Based Learning model in senior high school," *Journal of Physics: Conference Series*, vol. 1460(2020), pp. 1-6, 2020.

[17] N.F. Harun, K.M. Yusof, M.Z. Jamaludin, and A. Helmi, "Motivation in Problem-based Learning Implementation," *Procedia - Social and Behavioral Sciences*, vol. 56 (2012), pp. 232- 242, 2012.
[18] H. B. Gusman, R.C. Rachmawati, M. Ulfah, Maria, and R. E. Priyanta, "The effectiveness of Problem Based Learning in increasing students' cognitive outcomes and learning motivation," *Jurnal Mangifera Edu*, vol. 8, no. 1, pp. 32-39, 2023.
[19] Hu, H, "Rethinking Nature Journaling in the Kindergarten Program Action Research in Learning and Teaching*," Journal of Outdoor and Environmental Education*, vol. 25, no. 2, pp. 159- 179, 2022,
[20] H.S. You, K. Kyungun, K. Black, and K. Woo,"Assessing Science Motivation for College Students: Validation of the Science Motivation Questionnaire II using the Rasch-Andrich Rating Scale Model," *EURASIA JOURNAL of Mathematics, Science and Technology Education*, vol. 14, no. 4, pp. 1161-1173, 2018.
[21] S. Fuzukawa, C. Boyd, J. Cahn, "Students Motivation in Response to Problem Based Learning," *Collected Essays on Learning and Teaching*, vol. X(2017), pp. 175-188, 2017.
[22] A. Sumitro, P. Setyosari, "Penerapan Model Problem Based Learning Meningkatkan Motivasi dan Hasil Belajar IPS," *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*, vol. 2, no. 9, pp. 1188 – 1195, 2017.
[23] Arofiq, "Increased Motivation and Student Outcomes Through Problem Based Learning (PBL) in Mathematics Learning," *IJECA International Journal of Education & Curriculum Application*, vol. 2, no. 3, pp. 50-54, 2019.
[24] R. Simbolon, H. D. Koeswanti, "Comparison of PbL (Project Based Learning) Models with Pbl (Problem Based Learning) Models to Determine Student Learning Outcomes and Motivation," *International Journal of Elementary Education*, vol. 4, no. 4, pp. 519-529, 2020.
[25] R. B. Anila, R. Masruri, F. Irawati, H. C. Kurniawan, P. R. Primandiri, and A. M. Santoso, "Penerapan *Problem Based Learning* (PBL) untuk Meningkatkan Motivasi Belajar, Keterampilan Inkuiri dan Keterampilan Argumentasi Ilmiah Peserta didik SMPN Kediri pada Materi Perubahan dan Pencemaran Lingkungan," *Prosiding Seminar Nasional XII Pendidikan Biologi FKIP UNS (2015),* SP- 007-8, pp. 446-449, 2015.
[26] W. Andaresta, A. Putra, "Perbedaan Pencapaian Hasil Belajar Siswa dalam Pembelajaran Fisika antara Penerapan Model Problem Based Learning dan Discovery Learning," *Pillar of Physics Education*, vol. 12, no. 2, pp. 249-256, 2019.
[27] Z. Hasanah, S. Ritonga, and Z. Ikhsan, "The Implementation of Problem Based Learning Integrated with STEMBased Worksheets to Improve Learning Motivation," *Asian Journal of Science Education*, vol. 2, no. 2, pp. 102-112, 2021.
[28] B. AKCAY, "Problem Based Learning in. Science Education," *Journal of Turkish Science Education.*,vol. *6*, no. 1, pp. 26-36, 2009.
[29] R. T. Hidayat, H. Yurnetti, "Pengaruh Penggunaan Model Problem Based Learning (PBL) berbantuan Handout terhadap Kompetensi Fisika Siswa di Kelas X MIPA SMAN 2 Kota Solok," *Pillar of Physics Education,*vol. *12*, no. 4, pp. 705-712, 2019.
[30] M. D. Kristyanawati, S. Suwandi, "Improvement of Exposition Text Writing Motivation and Skills Through the Application of the Problem Based Learning Model," *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal*, vol. 2, no. 2, pp. 278-287, 2019.