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The Effectiveness of Forming a Pancasila Student Profile by Implementing a Project Based Learning Model on Newton's Law Material

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Abstract

This study aims to find the effectiveness of forming a Pancasila student profile by applying a project based learning model in the physics learning process for Newton's Law material in class X MIPA students at SMAN 1 Bajawa. The dimensions of the Pancasila Student Profile include three dimensions, namely the ability to think critically, creatively, and mutual cooperation. This type of research is a mixed method sequential explanatory. Data collection instrument were tests and observation guidelines. The results of the data analysis show that the project based learning model contains Pancasila student profile values. Based on the research data, it was obtained that the students' abilities on the Pancasila student profile is in the good category. The ability to critical thinking and crietive thinking has increased and can foster an attitude of mutual cooperation in students after being treated using a project based learning model. The N-gain value of critical thinking is 64.3% and classic completeness is 93%, the N-gain creative thinking increases by 68.5% and classic completeness is 90%, the students' cooperative attitude is 83% in the good category. This shows that the project based learning model that was implemented is effective in strengthening the profile of Pancasila students. The class control uses the PBL model N-gain value of critical thinking was 57.7%, the N-gain creative thinking increased by 53.3%, the mutual cooperation attitude of the students was in the with the medium category.

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INTRODUCTION

Learning is essentially a process of interaction activities between educators and students and learning resources in a learning environment, so that students can build attitudes, knowledge and skills to achieve goals (Sufairoh, 2016). Learning requires a specific strategy to create an atmosphere of active, critical thinking, analytical thinking, and creativity in solving problems through the development of thinking skills. The designed learning process continues to provide the best service by fostering creativity, innovation, skills and character values of students during learning activities (Wibowo, 2018). The learning system implemented seeks to instill Pancasila values in students so that they form good character and behavior.

The formation of the character of students in the learning process can improve competitive attitudes, good ethics, have morals and manners and establish relationships with the community. Students who behave well are able to manifest ethical, responsible, moral, tolerant and disciplined personalities (Haruna et el., 2021). Student character values will be formed through the Pancasila Student Profile profile.

The Pancasila Student Profile is one of the Ministry of Education and Culture's 2020 strategies in building the character of students. The Pancasila student profile is applied in learning so that each student has global competence and behaves according to Pancasila values. The profile of Pancasila students has the characteristics of global diversity, mutual cooperation, creativity, critical reasoning, independence, and faith, piety to God Almighty, and noble character (Brata et al., 2022)

Based on the results of observations at SMAN 1 Bajawa, the character of the students is still very low. The character of students is said to be still low because students still do not have a sense of responsibility for the tasks given by educators. Students do not try to find various information. The value of student honesty in admitting mistakes made is still low and there is still a lack of curiosity about new things and the sense of cooperation between students is very low.

Learning needs to apply a relevant learning model that places more emphasis on students constructing their own knowledge into meaningful knowledge through a project-based learning model (PjBL). PjBL is student-centered learning and is facilitated by educators in the learning process by involving project activities as a learning medium for the success of 21st century skills (Albar & Southcott, 2021). Students are given the opportunity to learn and take action on their own and are facilitated by educators in generating project ideas, action plans, designs, operations and project presentations from the experience gained (Pusztai, 2021). PjBL can be in the form of group and individual activities in producing a product.

The PjBL model emphasizes learning on student activities to produce products by applying the skills of researching, analyzing, making, up to presenting products based on real experience. The PjBL model focuses on the activeness of students in developing creative thinking, problem solving and linking knowledge, attitudes and skills to create new knowledge (Chaijum & Hiranyachattada, 2020)

This model has a positive influence on students' abilities, responsibilities and skills in producing products (Nilsook et al., 2021). PjBL can train the spirit of mutual cooperation by collaborating between students. Designing and producing a product can develop students' critical and creative thinking skills so that they are able to solve problems systematically.

METHODS

The research method used is the mixed method with a pretest-posttest control group design technique. Collecting Pancasila student profile data on the elements of critical thinking, creative thinking, and mutual cooperation of students through tests and observations. The learning model used is the project-based learning model.

This research was conducted at SMAN 1 Bajawa East Nusa Tenggara. The population of this study students of X MIPA who had not received Newton's Law material. The research sample was class MIPA 1 and MIPA 3. MIPA 1 class students as the control class using problem based learning and MIPA 3 class students as the experimental class using project based learning. PBL directors students to think critical in solving problem. While PjBL requires students to create a project to improve critical thinking and creative thinking.

Data collection techniques using observation and tests. The research instrument consisted of observation sheets and pretest and posttest questions. Data analysis used the t test, gain test and classical mastery test to determine the effectiveness of forming a Pancasila Student Profile through elements of critical thinking, creative and mutual cooperation with the Project based learning model. Elements of critical thinking, creative thinking, and mutual cooperation in the profile of Pancasila students have indicators which can be seen in Table 1.

Table 1. Indicator of critical thinking, creative thinking and mutual cooperation

Number	Measured elemen	Indicator
1.	Critical thingking	Obtaining and processing information Reflecting thoughts Analyze and evaluate Make decisions
2.	Creative thingking	Think original Produce work
3.	Mutual Cooperation	Collaboration, care, and share

RESULTS AND DISCUSSION

Learning using the project based learning model is expected to be able to build knowledge through student experience in developing better student character through project-making activities. Implementing the project based learning model, student learning activities are more fun, more active, challenging and create a wide space for students to develop ideas and develop creativity. Ruslan et al. (2021) stated that learning through a project-based learning model creates meaningful learning experiences for students academically but also for character growth and development.

Character development is very important to instill character values in students. Student character values are formed through strengthening the Pancasila Student Profile in learning. The Pancasila Student Profile which is applied in the learning process focuses more on critical thinking, creative thinking and mutual cooperation.

Analysis of the data obtained shows that the data used was normally distributed and homogeneous. Based on the data analysis, it was obtained that the initial abilities of the control class and experimental class students were relatively the same. The average initial ability of students in the control class reached 42, while the abilities of students in the experimental class reached 43. Learning was given treatment using a project based learning model in the experimental class while using a problem-based learning model in the control class experienced changes in critical thinking, creative and mutual cooperation.

Critical thinking

Analysis of differences in the average T test which aims to determine differences in results before being treated and after being given treatment. The results of the analysis of differences is tabulated in Table 2.

Table 2. Average Difference Test

Data Type	Sig. Value
Pretest	0.349
Posttest	0.01

Table 2 shows that the value of Sig. pretest data = 0.349 > 0.05 then H0 is accepted. Therefore, the two groups of pretest scores have the same average between the experimental class and the control class. Sig. Value posttest data = 0.01 <0.05, then H_0 is rejected. The two posttest groups have different averages between the experimental class and the control class. The results of the analysis show that there are differences in the critical thinking skills of the experimental class and the control class. The N-gain value of students'critical thinking can be seen in Table 3.

Tabel 3. Students' Critical Thinking N-Gain Test Results

Data Type	N-Gain (%)	category
control Class	57.7	medium
Experiment class	64.3	medium

Table 3 shows that students' critical thinking has increased after learning. The critical thinking of students in the control class using problem based learning increased to the moderate category, as well as the critical thinking of students in the experimental class using project based learning has also increased to the moderate category. The experimental class has a higher N-Gain value than the control class. In the experimental class using the PjBL model, students were trained to find knowledge through projects carried out. The classical completeness of students can be seen in Table 4.

Table 4. Classical Critical Thinking Completeness Test

class	category	total	Percentage (%)
Experiment	<=70	2	7
	>70	28	93
control	<=70	4	13
	<=70	26	87

Table 4 shows that the completeness score of the students in the experimental class was accepted with the results of the completeness of the students reaching the KKM of more than 75% completing the lesson. Changes in critical thinking can also be seen from the four indicators of critical thinking in the profile of Pancasila students. The improvement of students' critical thinking for each indicator in the experimental class and control class can be seen in Figure 1 and Figure 2.

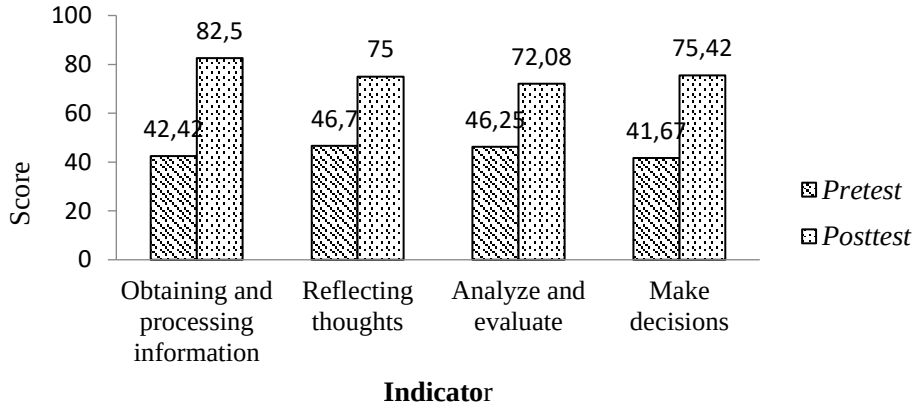

Figure 1. Critical thinking of control class students

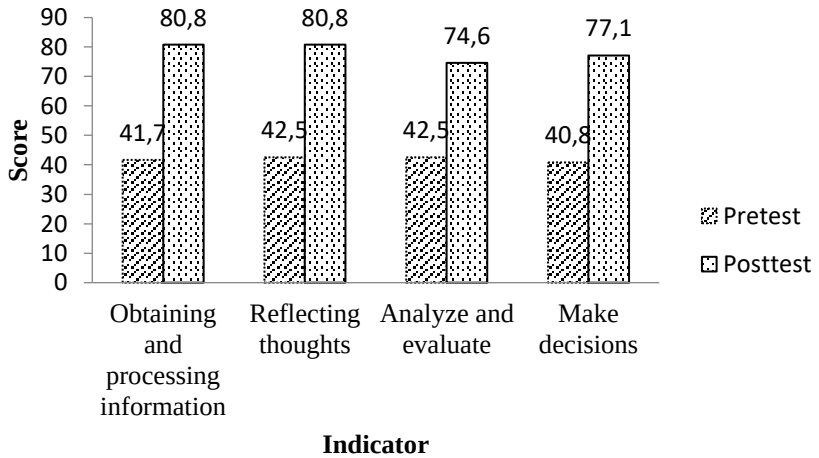

Figure 2. Critical thinking of experimental class students

Figure 1 and Figure 2 show that there is an increase in each indicator in the control class and the experimental class. Experimental class students experienced a higher increase than the control class. The critical reasoning dimension consists of four elements, namely the elements of obtaining and processing information and ideas, reflecting on thoughts and thinking processes, analyzing and evaluating and making decisions.

The ability to think critically about students in the Pancasila Student Profile is to shape the character of students through mindsets. The results of the analysis of students' critical thinking skills based on the results of the t test experienced differences between the experimental class and the control class. The thinking ability of students has increased with the N-gain test results obtained by the experimental class of 57.7% classified as moderate and the N-gain test obtained by the control class by 64.3% classified as moderate. The classical mastery obtained by students is 93% of students who have the ability to think critically which can produce ideas that can improve creative thinking to create useful projects.

Creative Thinking

Analysis of differences in the average T test which aims to determine differences in results before being treated and after being given treatment. The results of the analysis of differences can be seen in Table 5.

Table 5 Average Difference Test

Data Type	Sig. Value
Pretest	0.37
Posttest	0.00

Table 5 shows that the sig. pretest data 0.37 > 0.05 then H_0 is accepted. The two groups had different pretest scores between the experimental class and the control class. The posttest sig data value of 0.00 <0.05 has an average that is not the same between the experimental class and the control class. So, this shows that there are differences in the ability to think creatively in the two classes. The experimental class has a higher N-Gain value than the control class. The N-gain value of students'creative thinking can be seen in Table 6.

Table 6. Students' Creative Thinking N-Gain Test Results

Data Type	N-Gain (%)	category
Control Class	53.3	medium
Experiment class	68.5	medium

Table 6 shows that students' creative thinking has increased after learning. The creative thinking of students in the control class experienced an increase in the moderate category, as well as the creative thinking of students in the experimental class also experienced an increase in the moderate category. The experimental class has a higher N-Gain value than the control class. The classical completeness of students can be seen in Table 7.

Table 7. Calcical Completeness Test for Creative Thinking

Class	category	total	Percentage (%)
Experiment	<=70	3	10
	>70	27	90
Control	<=70	17	57
	<=70	13	43

Table 7 shows that the completeness score of the students in the experimental class was accepted with the results of the completeness of the students reaching the KKM of more than 75% completing the lesson. The thinking abilities of control class and experimental class students can be seen in Figure 3. and Figure 4.

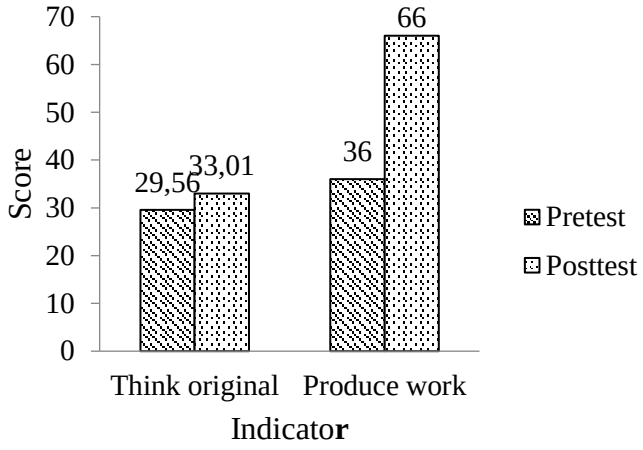

Figure 3. Creative thinking of control class students

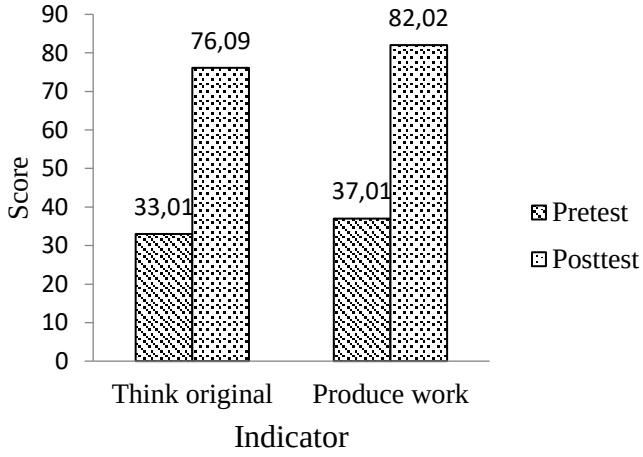

Figure 4. Creative thinking of experimental class students

Figure 3 and Figure 4 show that the Pancasila Student Profile elements of creative thinking using the project based learning model hone students to show their abilities through the process of designing and manufacturing a product. Students' creative thinking tests at the beginning of learning revealed that students' knowledge was still very low. Students were treated using the project based learning model in the experimental class and problem based learning in the control class, the students' posttest results increased.

Student test results were analyzed using the t test to see differences in the control class and the experimental class. The difference test shows that there are differences in the ability to think creatively in the experimental class and the control class. Students experience an increase in the ability to think creatively in the moderate category in the experimental class and control class. The experimental class experienced a higher increase in creative thinking with an N-gain of 68.5% while the increase in the control class with an N-gain of 53.3% was lower. The completeness of the students obtained by the experimental class was 90% and the control class was 57%. The completeness of the students in the experimental class ho was accepted with the results of achieving completeness in the maximum completeness criteria of more than 75% in learning. Project-based learning can significantly improve students' creative thinking skills by getting used to exploring thoughts and developing creative ideas (Chrysti et al., 2018).

Mutual Cooperation

Data from the research on students' cooperative attitudes were obtained using the observation method seen in Table 8.

Table 8. Mutual Cooperation Attitude

Criteria	The number of students		Percentage (%)	
	Control	Experiment	Control	Experiment
Very good	6	5	20	16.67
Well	23	25	76.67	83.33
Not good	1	0	3.33	0
Very less	0	0	0	0

Table 8 shows the mutual cooperation attitude of students in the control class and the experimental class. The mutual cooperation attitude of the experimental class is 83% well and 16% very good. The mutual cooperation attitude of students in the control class is 76% in the good category, 20% is very good and 3% is not good. The mutual cooperation attitude of students in the experimental class and control class is in good category. The value of student cooperation applied in learning will become a habit for students in everyday life (Srirahmawati & Hunaifi, 2022)

The results of the tests and observations made can be concluded that the ability of the Pancasila Student Profile includes the dimensions of critical thinking, creative thinking and mutual cooperation in physics learning are still in the good category. Strengthening the dimensions of the Pancasila student profile needs to implement the project learning model. project-based learning that can develop soft skills and build the character of Pancasila students in students (Imania et al., 2022).

Project Based Learning to form a Pancasila Student Profile

Project based learning (PjBL) is a learning model that emphasizes more student-centered projects and activities. Students are more active during the learning process and can strengthen the Pancasila student profile of students in the physics learning process. PjBL supports student learning outcomes and develops students' abilities especially for communication, collaboration, creativity, and critical thinking (Issa & Khataibeh, 2021).

The PjBL model can strengthen students' critical reasoning abilities which have been carried out by (Sularmi et al, 2018) which states that during the learning process with the PjBL model, students play an active role in the learning process, and motivation also increases, so that it has a significant influence in increasing students' critical thinking skills. Students' critical thinking skills in the physics learning process found that the learning process with the PjBL model can bring up indicators of critical thinking and elements of thinking involved with critical thinking (Seibert, 2020)

The PjBL model provides opportunities for students to investigate, plan, design, and reflect on project Rodiyah (2021) it was found that project-based learning was more effective in increasing student creativity. Learners are more confident and their creative thinking skills develop better by using the PjBL model.

In addition to the dimensions of the Pancasila student profile, critical thinking and creative thinking, the PjBL model can also strengthen the dimensions of student cooperation. Project-based learning is proven to be able to develop strengthen group collaboration and improve students' interpersonal skills. Collaboration is in the form of good cooperation between students, between educators and with others outside the school environment, and every cooperative interaction is considered a form of mutual cooperation (Markula & Aksela, 2022).

The project based learning model in learning accelerates the achievement of forming a Pancasila student profile in schools and the formation of a Pancasila student profile is very effective in shaping the character of students. This is evidenced by the achievement of the dimensions of critical thinking, creative thinking and mutual cooperation on the Pancasila student profile in the teaching and learning process. The implementation of project-based learning produces products in the form of Newton's Law teaching aids that can increase understanding of the material and can develop the skills and characteristics of students. Project based learning encourages students to think critically and improve creative skills in solving real problems in expanding knowledge by involving collaboration in completing products so as to enhance intellectual development (Cortázar et al., 2021).

CONCLUSION

The project based learning model creates meaningful learning experiences for students academically and also for character growth and development. The project based learning model

used in physics learning is effective for strengthening the profile of Pancasila students on the dimensions of critical, creative thinking and working together in shaping the character of students.

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