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Research Article

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Optimization of the Pancasila student profile character through the local wisdom project of *Hylocereus* sp. plants

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ABSTRACT

The Pancasila Student Profile (PSP) character is an important element in forming an excellent and integrity-filled generation of Indonesians, because this research has only been done very little. The objective of this research should be to analyze the influence of PjBL learning on the PSP character and the dimensions of cooperation, critical thinking, and creativity through the local wisdom of the *Hylocereus* sp. plant. The type of research is quasi-experimental, with a two-treatment group design. The independent variable uses PjBL learning, and the dependent variable is PSP in biology learning, including practical training in making Bokashi and maintaining dragon fruit plants. The population in this study was students of SMP Negeri 2 Pesanggaran, Banyuwangi Regency, East Java, Indonesia. The research sample consists of students undertaking a local wisdom project, 30 students in group A and 30 students in group B, for a total of 60 people. Instrument research is an observation sheet of the PSP character adapted from the Ministry of Education and Culture of the Republic of Indonesia. The data obtained were analyzed using multivariate analysis, namely MANOVA. The research results indicate a simultaneous effect of the PjBL learning model on the PSP character and a partial effect on the dimensions of cooperation, critical thinking, and creativity (sig < 0.05). Thus, local wisdom-based projects have proven to be an effective strategy in supporting the achievement of the PSP character and efforts for the sustainability of natural resources. Integration of local wisdom into learning can be an innovative strategy to support the sustainability of natural resources while forming students with integrity by Pancasila values.

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INTRODUCTION

Since the outbreak of Corona in 2019, known as COVID-19, the learning model has shifted to online learning (Hikamah et al., 2021; Luthfi & Hamdi, 2020). Natural science learning in junior high schools in

Indonesia is mainly based on electronic media such as whiteboard animation (Siswosuharjo et al., 2024), interactive multimedia (Iskandar et al., 2023), video (Pantiwati et al., 2024), and augmented reality (Krishnamurth et al., 2020). In this online learning, students interact less with their friends, even with the surrounding nature. On the other hand, the nature and environment around us require attention and proper management from the younger generation, the successors of the nation, to ensure their sustainability (Ardoin et al., 2020; Birch et al., 2020). The country of Indonesia, as an archipelagic nation, has a variety of natural resources spread across its many islands (Risnain, 2021; Trihatmoko & Susilo, 2024). This diversity needs to be preserved and maintained, especially by the younger generation, for the sustainable life of future generations (Faturrahman, 2023; Saengsanga et al., 2024). One of the local potentials in Banyuwangi Regency is the dragon fruit plant (*Hylocereus* spp.). The problem is that the use of local potential in learning has not been done much until now. This results in students in Indonesia being less concerned with natural resources, especially local potential in their areas. Previous research informs that instilling concern for sustainable natural resources is through education in schools, especially by utilizing local potential (Tyas et al., 2024), to preserve sustainable natural resources (Saengsanga et al., 2024). The learning model that aligns with those expectations is the student-centered learning model (Deehan et al., 2024), like the Project-Based Learning (PjBL) model, because this model involves students actively participating in the learning process (Hindun et al., 2024; Ndiung & Menggo, 2024). In this learning model, teachers and students collaborate to foster creativity and innovation throughout the learning process (Hikamah et al., 2024; Hikamah et al., 2024; Lefebvre & Luo, 2020; Rajamurugu, 2024).

The PjBL is also a recommended learning model in the Indonesian education curriculum (Nizam, 2020). The PjBL prioritizes student involvement in the problem-solving process and the process of finding the right solutions to produce a product that aligns with the student's talents and interests (Elvianasti et al., 2022; Riskiyah & Al-Uyun, 2022; Saepul et al., 2023). In this lesson, students are trained to formulate basic questions, create project designs, develop learning activity schedules, monitor progress, assess outcomes, and evaluate experiences (Markula & Aksela, 2022; Siswati et al., 2023). Therefore, this PjBL learning model can awaken students' potential for collaboration or cooperation skills (Andriyani & Anam, 2022; Hairida et al., 2021; Khasanah et al., 2023), creativity (Baptist et al., 2020; Deria et al., 2023; Laelasari & Sholehah, 2021), and critical thinking (Solida & Amir, 2023). The three skills mentioned above are the character and competencies expected of students based on the noble values of Pancasila.

In the research conducted by Putri and Minsih (2023), the formation of PSP character is carried out through scouting activities with a qualitative descriptive research method and data collection through observation. Research by Safwah et al. (2024) on the formation of PSP character is carried out through physical education, with a descriptive qualitative research method with a case study design, data collection through observation, interviews, and documentation. According to research by Arifin et al. (2024), the formation of PSP characters is carried out through religious activities, with a qualitative method with a case study research design, interviews, observation, and documentation of data collection methods. Research by Rathi et al. (2024) about the origin of the dragon fruit plant, the spread of the plant to various countries, and the chemical content in dragon fruit, namely that it contains antioxidants, which play an important role in reducing chronic diseases. Research by Luu et al. (2021), in Vietnam, on extracts from the stems, flowers, skin, and flesh of dragon fruit dragon fruit is used to have cardiovascular and hepatoprotective properties, as well as prebiotic potential. In this study, the learning process was carried out in junior high schools through a local wisdom-based learning project, namely the dragon fruit plant *Hylocereus* sp. The research was conducted by fermenting organic waste into bokashi fertilizer, fertilizing *Hylocereus* sp. plants with bokashi, and maintaining *Hylocereus* sp. plants until they are productive

(bearing fruit). The objective of this research should be to analyze the influence of PjBL learning on the PSP character and the dimensions of cooperation, critical thinking, and creativity through the local wisdom of the *Hylocereus* sp. plant.

RESEARCH METHODS

The type of research is quasi-experimental, with the posttest two-group design (Figure 1), which explains the posttest of group A and the posttest of group B. The independent variable uses PjBL learning, and the dependent variable is PSP character in biology learning, which includes the group A project, practicing in making Bokashi, and the group B project, maintaining dragon fruit plants. The population in this study was students of SMP Negeri 2 Pesanggaran, Banyuwangi Regency, East Java, Indonesia. SMP Negeri 2 Pesangaran was selected as the research location using a random technique. The research sample consisted of two groups that carried out a local wisdom project, 30 students in group A and 30 students in group B, for a total is 60 people. The sample used was 30 students in each group. The determination of this sample is based on academic reports obtained from the Minimum Competency Assessment (MCA) scores, environmental surveys, and Basic Education Data (BED), which are small, as well as on the percentage increase in student scores, which is the smallest. This research sample was also selected using a random technique because the research approach used was quantitative, so determining the location selection technique and the sample required a random technique. The research only took 60 samples because these samples were representative enough to be researched and could answer the research questions.

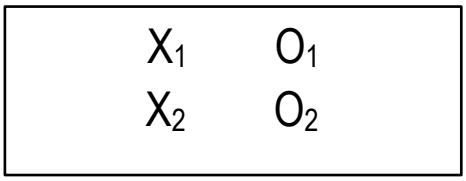

Figure 1. Quasi-Experimental Research with the Posttest Two-Group Design

Information:
X_1: Practicing in making Bokashi PjBL
X_2: Maintaining dragon fruit plants PjBL
O_1: Posttest of group A
O_2: Posttest of group B

Instrument research is an observation sheet of the PSP character adapted from the Ministry of Education and Culture of the Republic of Indonesia. Character instruments of the PSP include cooperation, critical thinking, and creativity. The observation sheet can be seen in Table 1. The assessment criteria are as follows. Score 1 is starting to develop, score 2 is developing, score 3 is developing as expected, and score 4 is developing significantly.

Table 1. Criteria for the PSP

Character	Criteria
Cooperation	Aligning one student's actions with the actions of other students in carrying out learning activities to achieve learning goals, as well as motivating others to work effectively and achieve common goals.

Character	Criteria
Critical Thinking	Asking questions for clarification and interpretation of information, as well as finding out the causes and consequences of that information.
	Analyzing and evaluating reasoning and its procedures. Proving reasoning with various arguments in drawing a conclusion or decision
Creative	Generating original ideas. Connecting existing ideas with new information or ideas produces a combination of new and imaginative ideas to express thoughts and feelings.
	Producing original works and actions. Exploring and expressing thoughts and feelings in the form of words and actions, as well as evaluating them and considering their impact on others.

The type of data in this study is interval. The data in this study were obtained from two groups, each consisting of 30 students. The specifications for the first and second groups were sequentially taught using the PjBL model in biology lessons, which included group A doing practical exercises in making Bokashi and group B caring for dragon fruit plants. Subsequently, the data obtained were analyzed and presented in Table 2.

Table 2. Between-Subjects Factors

Group	Value Label	N
A	Bokashi Group	30
B	Dragon Fruit Care Group	30

The influence of PjBL on the PSP character in three dimensions, which include the dimensions of cooperation, critical thinking, and creativity, is then examined. Next, these variables are categorized into independent and dependent variables. The independent variable is PjBL, which is divided into two groups. The first group is on the practice of making bokashi as X1, and the practice of caring for dragon fruit plants as X2. The dependent variable is the PSP, which consists of 3 dimensions: the dimension of cooperation as Y1, critical thinking as Y2, and creativity as Y3. The data obtained were analyzed using multivariate analysis, namely MANOVA were analyzed using SPSS.

FINDING AND DISCUSSION

Based on the research activities that have been carried out, namely teaching PjBL in two groups, with group A the PjBL in making Bokashi, and group B the PjBL in maintaining dragon fruit plants, the results obtained are shown in the PSP character, which is presented in Table 3. The character of cooperation is called CO, the character of critical thinking is called CT, and the character of creativity is called C.

Table 3. Observation Data on the Dimension of Cooperation, Critical Thinking, and Creativity

No	Cooperation (CO)		Critical Thinking (CT)		Creative (C)	
	CO1	CO2	CT1	CT2	C1	C2
1	3	3	2	3	3	3
2	3	3	2	2	3	3
3	3	3	3	3	3	3
4	3	3	3	3	3	3
5	2	2	2	2	2	2
6	3	3	3	3	3	3
7	3	2	2	2	3	3
8	2	2	2	2	2	2
9	3	3	3	3	3	3
10	3	2	3	3	3	2

No	Cooperation (CO)		Critical Thinking (CT)		Creative (C)	
	CO1	CO2	CT1	CT2	C1	C2
11	3	3	3	3	3	3
12	2	2	2	2	2	2
13	3	3	3	3	3	3
14	3	3	3	3	3	3
15	2	2	2	2	2	2
16	3	3	3	3	3	3
17	3	2	2	2	2	2
18	2	2	2	2	2	2
19	3	3	3	3	3	3
20	3	3	3	3	3	3
21	3	3	3	3	3	3
22	3	3	3	3	3	3
23	3	3	3	3	3	3
24	3	3	2	2	3	3
25	3	3	3	3	3	3
26	3	3	3	3	3	3
27	2	2	2	2	2	2
28	3	3	3	3	3	3
29	3	3	3	3	3	3
30	3	3	3	3	3	3
Total	84	81	79	80	83	82

Table 3 shows that the CO score of group A is 84, the CO score of group B is 81, the CT score of group A is 79, the CT score of group B is 80, the C score of group A is 83, and the C score of group B is 82. Next, this data will be analyzed to conclude whether the research hypothesis is accepted or rejected, as an effort to answer the research objectives. The results of the data homogeneity test can be seen in Table 4.

Table 4. The Results of the Data Homogeneity Test

Box's M	F	df1	df2	Sig.
.567	.089	6	24373.132	.997

Table 4 shows that the research data is stated as homogeneous (sig < 0.05). Therefore, the data will be analyzed using MANOVA. The results of the MANOVA test can be seen in Table 5.

Table 5. The Results of the MANOVA test

Group Effect	Sig.
Pillai's Trace	.000
Wilks' Lambda	.000
Hotelling's Trace	.000
Roy's Largest Root	.000

Table 5 shows that the significance value of Wilk's Lambda is 0.000 (sig < 0.05), which explains that the PjBL learning model has a simultaneous effect on the PSP character. Furthermore, the results of the MANOVA test toward cooperative skills (CO), critical thinking skills (CT), and creativity (C) can be seen in Table 6.

Table 6. The Results of the MANOVA test toward CO, CT, and C

Group Effect	Sig.
CO	.000
CT	.000

C	.000

Table 6 shows that the significance value of the three PSP dimensions is 0.000 (sig < 0.05), where the PjBL learning model has a partial effect toward cooperative skills (CO), critical thinking skills (CT), and creativity (C).

The results of this study are in line with previous research that PjBL can optimize soft skills. Important soft skills in the 21st century include collaboration, critical thinking, and creativity. These three soft skills can be developed optimally through a learning method that involves students exploring experiences, being active, and reflecting while they learn by doing projects (Hikamah et al., 2024; Kearney et al., 2024). Therefore, project-based learning is one of the models that can bridge the achievement of learning objectives, including collaboration skills, critical thinking skills, and creativity. This is also confirmed by previous research that through PjBL, students engage in learning through a process, namely conducting investigations to respond to complex questions, problems, and challenges (Asman et al., 2022). Through learning with PjBL, students are trained to carry out learning by practicing directly, so that they empower their potential, which includes skills in working together with their group, bringing out critical thinking skills, and creativity.

The results of the research with PjBL are also supported by the use of dragon fruit plants as a local potential, namely dragon fruit (*Hylocereus* sp.). Previous research has indicated that project-based learning based on the potential of students' local areas yields better results in enhancing soft skills, engagement, and core learning competencies (Syahril et al., 2022). Other research also shows that students achieve cooperation through project-based learning (Rohmadin et al., 2020). Gotong-royong is a cultural value that serves as the identity and foundation of the Indonesian nation. However, with the advancement of technology, this value has been declining because society is becoming more individualistic. The map of gotong-royong is inversely proportional to the map of individualistic traits in society, meaning that the stronger the value of gotong-royong in society, the weaker the individualistic traits (Febriani et al., 2020; Sarif et al., 2023). The character of cooperation is one of the important aspects that must be developed in students during the learning process. This is expected to form individuals who are socially insightful and able to work together in everyday life (Zakiya & Santoso, 2024).

The results of research with this project also indicate that there is an impact on students' critical thinking, which is consistent with previous research that project-based assessments can enhance critical thinking skills (Putri et al., 2024). Critical thinking is an important need for individuals to make better decisions, as it is crucial for both personal interests and professional life (Turan et al., 2019). In addition to that, learning that explores students' critical thinking skills is beneficial for training students to analyze information, make decisions, and solve problems creatively. This is important in modern education (Fitrianto & Hidayat, 2024). Project-based learning provides a learning experience through a process, starting from planning, executing the project, presenting the results, and evaluating. According by previous research that learning with PjBL can stimulate creativity in students (Vuk, 2023). Creativity is an important skill for students and serves as their preparation for entering the workforce, as creativity becomes a crucial resource in the workplace and for their social sustainability (Kottwitz et al., 2024).

The *Hylocereus* sp. plant in this area has become an icon of the sub-district. Therefore, this plant can be found both in the fields and around the houses of all the residents. The existence of plants, besides being beneficial as fruit producers for economic needs, also serves as a source of oxygen (O_2) that is very beneficial for life. This helps reduce carbon dioxide (CO_2) emissions to maintain the sustainability of nature (Jiao et al., 2023). Maintaining natural resources now will reduce damage in the future (Castro &

Lopes, 2022). Earth provides the most important natural resources for life, such as O_2 and water (H_2O), for survival. However, humans exploit it with technology, resulting in increased pollution and disposal of waste into the surrounding environment. As a result of irresponsible community activities, the Earth's ecosystem is in great danger and requires efforts from various parties to immediately protect it. Therefore, in previous research, it was stated that through learning with local wisdom utilization projects, this is one solution that can be implemented to prevent environmental damage and for the sustainability of natural resources (Kolakoti & Setiyo, 2024).

CONCLUSION

The results of the analysis with MANOVA showed that there is a simultaneous effect of the PjBL learning model on the profile of Pancasila students, with a value of 0.000 (sig < 0.05). In addition, the results also showed that there is a partial effect of the PjBL learning model on the profile of Pancasila students in the dimensions of cooperation, critical thinking, and creativity dimensions with a value of 0.000 (sig < 0.05). These results inform that learning with the PjBL model has an effect on PjBL on the PSP character and the dimensions of cooperation, critical thinking, and creativity through the local wisdom of the Hylocereus sp. plant, through PjBL students learn through a process, namely conducting investigations to respond to complex questions, problems, and challenges so that they can empower the potential of students' soft skills. These results also show that the integration of local wisdom into learning can be an innovative strategy to support the sustainability of natural resources while forming students with integrity by the values of Pancasila.

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