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Local Wisdom Themes in Project for Strengthening the Profile of the Pancasila Student: A New Perspective on Science Learning in Junior High School

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Abstract

The research aimed to analyze science learning through the implementation of the Project for Strengthening the Profile of Pancasila Student (P5) with local wisdom theme in Junior High School (SMP). The focus of the study was to explore the methods, employed within the Project for Strengthening the Profile of Pancasila Student framework. Also, it aimed to analyze the science learning processes during these activities, particularly in relation to local wisdom themes. Data were collected from 97 students in grades VII, VIII, and IX at SMP PIRI 1 Yogyakarta through observations on November 28, 2023, and simple interviews with students and teachers to collect feedback on the Project for Strengthening the Profile of Pancasila Student activities. The local wisdom theme was "*Batik*." The activities commenced with a Duha prayer and an opening session, followed by the presentation of batik material, group divisions, and the process of creating batik designs. The process incorporates the application of scientific concepts, such as biodiversity and changing in states of matter, and mixtures. The findings indicate that the application of the P5 framework with a local wisdom theme enhances students' understanding of scientific concepts and their engagement in learning. It is hoped that these findings will contribute to the development of more contextual and relevant teaching methods. The research used qualitative research with an interview. The interview instrument was developed by determining the objective of the interview, formulating the activities or aspects, arranging the indicators, and conducting the interview. Data analysis was carried out by synthesizing the data from interviews.

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INTRODUCTION

Education is a critical cornerstone of societal life (Rizik et al., n.d., 2021). Within an educational framework, the curriculum must be dynamic, continually evolving to meet contemporary challenges and advancements. However, the changes must be conducted systematically and purposefully, rather than arbitrarily. The history of the curriculum in Indonesia reflects a long evolution, with significant revisions recorded in 1947, 1952, 1964, 1975, 1984, 1994, 2004, 2006, and most recently, the 2013 curriculum (Alhamuddin, 2014).

The 2013 curriculum is a strategic policy aimed at preparing Indonesian society to face future challenges and demands (Machali, 2014). As time progresses, questions and concerns have arisen to the effectiveness and relevance of the 2013 Curriculum. Recently, there has been considerable debate on its potential replacement with "Merdeka Curriculum." A new curriculum emphasizes freedom, innovation, and the capacity for students to adapt. "Merdeka Curriculum" aspires to cultivate resilient, independent, and creative learners through a more open and

inclusive pedagogical approach (Gumilar et al., 2023).

Through the implementation of P5 (Project for Strengthening the Profile of Pancasila Student) in "Merdeka Curriculum", students might enhance their creativity and autonomy, and developing a more objective perspective (Suzetasari et al., 2023). The "Merdeka Curriculum" is founded on several key principles: simplicity, comprehensibility, a focus on student competence and character, flexibility, collaboration, and responsiveness to learning outcomes and feedback. Additionally, it incorporates the Pancasila student profile as a synthesis of national educational objectives, wherein students are encouraged to engage in project-based activities designed to strengthen the Pancasila student profile, abbreviated as P5 activities (Kemdikbudristek, 2022).

There are six dimensions in "Merdeka Curriculum" framework, known as the "*Profil Pelajar Pancasila*" (Pancasila student profile). They are 1) Faith in God Almighty and noble character; 2) Independence; 3) Critical thinking; 4) Creativity; 5) Collaboration; and 6) Global diversity. Through the application of these principles, students are expected to navigate the challenges of the 21st century. These 21st-century skills can be further developed through the implementation of P5 (Project to Strengthen the Pancasila Student Profile) (Irawati, 2022).

The Pancasila student profile represents an ideal that is to be nurtured in Indonesian students, supported by all stakeholders through six interconnected competencies. These competencies must grow in harmony to fully realize the Pancasila student profile: faith and devotion to God, global awareness, collaboration, independence, and critical and creative reasoning (Saphira, 2022; Rusnaini et al., 2021).

The implementation of P5 encompasses several themes, including: 1) Sustainable lifestyle; 2) Local wisdom; 3) Diversity (*Bhineka Tunggal Ika*); 4) Holistic development of body and soul; 5) Voice of democracy; 6) Engineering and technology; and 7) Entrepreneurship (Satria, 2022). The primary objective of P5 is to reinforce and integrate Pancasila values into Indonesia's national education system (Nahdiyah et al., 2022).

The particular research aims to analyze science learning through the implementation of the P5 local wisdom theme in Junior High School. Specifically, the objectives of this study are to explore the methods employed in the P5 local wisdom theme and to study the science learning outcomes associated with these activities. The research' question is how the methods are employed in the P5 local wisdom theme and the literature review on P5 local wisdom and science learning outcomes.

Moreover, the research is urgent since the latest research stated that P5 has a relationship with the science learning outcomes. Other studies show the independent curriculum-based on the Pancasila Student Profile and focuses on developing student character- improved the learning process in the areas of knowledge, attitudes, and skills (Rachmawati et al., 2022).

Also, the process of creating this *Batik Tulis* (hand-drawn style Batik) have several natural science materials, including: changes in material (physical and chemical changes), in form, color indicators, and acid-base solutions (Setianingrum & Jumadi, 2023)

Other researchers formulated the concept of "culturally relevant education" as a synthesis of education that integrates math, science, social studies, and language arts. The concept describes a system of social justice-oriented pedagogy, known as culturally responsive teaching (Nurhairani et al., n.d.).

RESEARCH METHOD

The research employed a qualitative descriptive research design (Creswell, 2017) to explore the implementation of P5 activities centered on the theme of local wisdom in junior high schools. Also, it aimed to study the science learning outcomes associated with the implementation of P5. The analysis process follows a systematic approach. It begins with data reduction, and followed by data presentation and literature review. Then, it ends with a conclusion drawing (Huberman & Miles, 2002).

Data were collected from SMP PIRI 1 Yogyakarta, involving 97 students from grades VII, VIII, and IX. The sampling selection technique used simple random sampling since the students are homogenous. The data collection involved observing the P5 processes

on November 28, 2023 and conducting simple interviews with some students and teachers to collect testimonials of their experiences with the P5 activities.

The visualization of the employed method is presented in Figure 1.

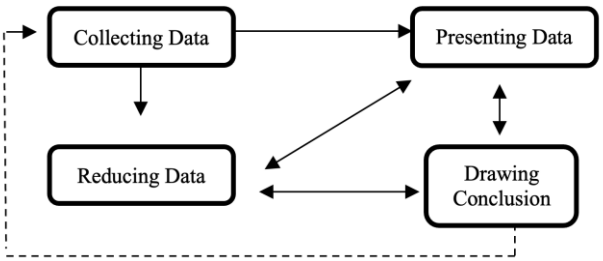

Figure 1. The Visualization of Employed Methods

According to Sugiyono (2019), data collection for qualitative research is done in authentic, natural environments. Therefore, in-depth interviews, documentation, and observation were used to collect primary data. In the meantime, literature evaluations from several reading sources that also covered pertinent subjects were used to gather secondary data. Data reduction is the next stage after acquisition. Reducing data entails condensing, selecting the key elements, and concentrating on what matters. So, the reduced data will provide a clearer picture and make it easier to collect further data. The data display is conducted after data reduction. Data from qualitative research will be displayed as narrative or descriptive text. After that, the data is sorted to gain clarity. These conclusions may take the shape of ideas, causal connections, or hard data.

The data were taken from interviews, observations, documentation, and literature review, as a complement to the data. Observations and interviews were conducted to find out the process of batik-making. Also, it used to find out the literature review between P5 local wisdom and the science learning outcomes. The research was conducted by conducting interviews with the teacher and the student. The interviews were unstructured interviews and face to face. The results of the interviews are written in tabular form. Observation data were obtained during the observation of the process of batik-making through the P5 activity in SMP PIRI 1 Yogyakarta.

The items of the interview were validated by the expert using the instrument validation criteria, consisting of ethical, construction of questions, and accuracy of questions.

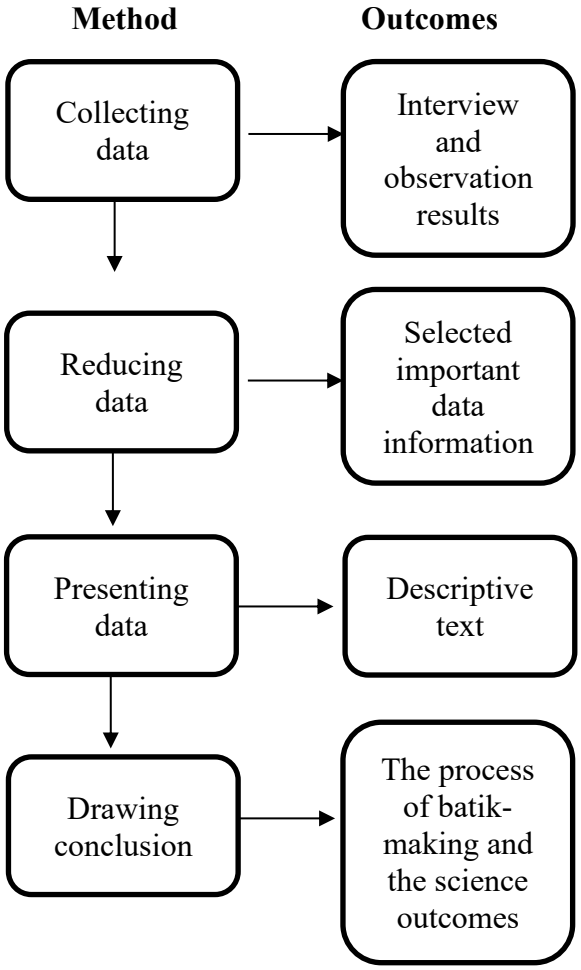

Figure 2. Flowchart of The Method Research

Figure 2 shows the flowchart of the method research. Furthermore, the diagram is used to clarify the flow of the research.

RESULT AND DISCUSSION

The reduced data interview from teachers and students is shown in Table 1.

Table 1. The Data Interview

Question	Teacher	Student
What is Merdeka Curriculum?	Merdeka curriculum is the curriculum that contains of Project for	Merdeka curriculum is the new curriculum that strengthens the students'

	Strengthening the Profile of Pancasila Student, known as (P5).	ability in concept mastery.
What do you think about the curriculum implementation?	The implementation of the curriculum is excellent.	The implementation of the curriculum is interesting.
What is the activity of P5?	The activity has some themes, one of theme is local wisdom.	The activity is batik-making.
What do you think about P5?	It is very useful to encourage students' motivations and concept mastery.	It is a good activity.
What do you think about the P5 and science learning outcomes?	P5 can increase the concept mastery level since it has a science concept in the steps of "Batik-making."	I become more understand about some concepts of science.
Should P5 is continued?	Yes, it can be the activity that encourage students to be more confident	Yes. It is a new activity that does not get boring.

The data of interview results in Table 1 consist of the definition of Merdeka Curriculum, the opinion of the teacher and the students about the curriculum implementation, the activity in P5, the opinion about P5, the opinion about the P5 and science learning outcome, and about the continuities of P5 activity. The data collection is continued by observing the P5 activity in SMP PIRI 1 Yogyakarta.

The P5 activity has themes around local wisdom, including the making of *batik tulis* using wax as the primary medium. The P5 initiative commenced with outreach efforts directed at parents and students, aimed at fostering effective communication between teachers and families to ensure collaboration throughout the P5 activities.

The dissemination session included an overview of the schedule and the procedural flow of the P5 activities, which were structured, as follows:

1. *Dhuha* prayer and Congregational prayer
2. Opening ceremony
3. Presentation of local batik wisdom
4. Group division
5. Completion of student worksheets
6. Preparation of tools and materials
7. Creation of batik designs on mori cloth
8. Application of wax on the mori cloth according to the design
9. Dyeing the waxed fabric
10. Removal of wax from the fabric
11. Washing the fabric
12. Drying the fabric

Exhibition and assessment

Figure 2. *Dhuha* prayer and Congregational prayer

These prayers were conducted to build character education among students, providing a spiritual foundation for the P5 activities. The teacher said, "*Dhuha* prayer and Congregational player are used to strengthen the

spirituality among the students, not only held on P5, but also once a week every Monday before study." This phenomenon shows that the spiritual attitude of students begins to grow and develop, which, in the next level, grows and develops the social attitude of students. So, it manifested the strength of the students' character (Alivermana Wiguna, 2020).

The opening ceremony, led by the Principal of SMP PIRI 1 Yogyakarta, aimed to motivate both students and teachers, emphasizing the importance of the P5 initiative. The Principal of SMP PIRI 1 Yogyakarta, Mr. Budi Prasetyo Dewo Broto, said, "The student should have high motivation in learning. So, through this P5 activity, we hope that students will focus on the group project and group discussion that leads the students to have high encouragement in the learning process".

Figure 3. The Opening of P5

Presentation of local *Batik* wisdom, led by the P5 coordinator; this session aimed to provide students with the necessary knowledge for batik-making. By outlining the process of batik-making, its prepared students for hands-on activities. The Teacher said, "The students should know the steps of batik-making, so when they practice, they can do the activity clearly."

Figure 4. Presentation of local *Batik* wisdom material

Students were grouped based on their chosen patterns, which fostered collaboration and creativity. This phase encouraged students to draw inspiration from the biodiversity surrounding them and integrating scientific concepts into their design choices.

Figure 5. Group Division

After that, it continued with the activity of filling in the student worksheet prepared by the teachers, which included historical context and relevant scientific concepts related to the batik-making process. The activity aimed to deepen their understanding of the intersection between art and science.

Figure 6. Filling out the student worksheet

The next activity is preparing tools and materials. Students prepared the necessary tools and materials for *Batik* production, including *"canting"* (a pen-like tool used to apply liquid hot wax in the batik-making process, more precisely *Batik tulis* or hand-drawn style *Batik*), electric stoves, small frying pans, mori cloth, wax, and fabric dyes.

Figure 7. Preparation of tools and materials

After that, the students make batik designs on mori cloth, guided by teachers. Students translated their chosen motifs onto mori cloth. It fosters their artistic expression.

Figure 8. Making of *Batik* designs on mori cloth

The next activity in the *Batik* process is applying wax to the mori cloth. The application of wax involved melting the wax and using a canting to inscribe designs on the cloth. This process illustrated the scientific concept of change, specifically the change solid to liquid upon heating (Holidiah et al., n.d., 2024).

After melting, wax is inscribed on the cloth using a tool called "*canting.*" This activity is guided by the Teacher as a facilitator. After the wax is etched onto the cloth, it will harden. It contains the science concept of changing state from water to solid, also known as freezing. Students must identify the scientific concepts under the teacher guidance.

Figure 9. Apply the wax on the mori cloth according to the picture design

During the batik-making process, the science teachers and students carried out the

process of applying wax on the batik cloth and asked the students to analyze the science concepts found. The teacher acts as a facilitator in P5 activities. Furthermore, teachers also play a role in providing knowledge to students so that wrong concepts do not occur.

This process contains the concepts of temperature and heat, which can be related to *Batik* activities, including temperature measurement and heat transfer. Students are asked to measure the temperature when heating wax. Apart from that, students are asked to analyze the concept of heat transfer when heating wax, namely the heat transfer by conduction as the heat moves through the pan and the "*canting*" (Armadani et al., n.d., 2023).

It continued dyeing the waxed fabric. The dyeing process, which was supervised by teachers, not only enhanced the aesthetic quality of the *Batik* but also introduced students to the concept of homogeneous mixtures.

Figure 10. Dye the waxed fabric

After dyeing, the next step is the "*nglorod*" process. It removes the wax from the *Batik* cloth to prepare it for use by dipping the cloth in boiling water. The process allows the solid wax to melt and separate easily from the fabric. This process illustrates the scientific concept of changing states of matter, specifically the transition from solid to liquid. The critical process involved boiling the fabric to melt the wax, emphasizing the science concepts of phase change and chemical reactions. The teacher facilitated this step to ensure safety.

Aiming to ensure safety, the teacher conducts the "*nglorod*" process, minimizing the risk of injury contacting with boiling water. Meanwhile, the students observe the procedure. Additionally, this process often involves the use of alkaline substances, such as sodium carbonate (soda ash) or sodium silicate (waterglass), which aid to the effective removal of wax.

The success of the "nglorod" process plays a crucial role in determining the halal status of *Batik* products. Since some *Batik* waxes may contain animal fat, it is vital for the Halal Product Process (PPH) to ensure that any residual wax is removed during the "*nglorod*" and washing phases. This aspect is urgent to maintain compliance with halal standards (Nurul Eskani et al., n.d., 2022).

Figure 11. Removing "*malam*" from the fabric

After the wax has been removed, it cannot be considered completely clean or ready for use, as residual wax may remain. Therefore, a washing process is required to achieve optimal results. This step is conducted by students, guided by their teachers to ensure the proper techniques. Effective washing not only enhances the cleanliness of the fabric but also reinforces the scientific concepts of solubility and dispersion as students learn how different substances interact with water and detergents. This step is crucial in preparing the *Batik* for its final presentation and use.

Figure 12. Washing fabric

After that, it dries the fabric to ensure completely moisture-free and to prevent mold growth. The drying process is conducted under sunlight, which effectively uses solar radiation to enhance evaporation. During this phase, the fabric undergoes radiation heat transfer as the sun's energy heats the surface, causing water to change from liquid to vapor. This process not only illustrates the scientific concept of evaporation but also emphasizes the importance of proper drying techniques in maintaining the fabric quality of the *Batik*.

Figure 13. Drying the fabric

The last step is exhibition and assessment to the *Batik*. Assessment focuses on several criteria, including the choice of design, the neatness, appearance, the clarity of the presentation, and the completeness of the student worksheets. This evaluation not only assesses the artistic and technical skills of the students but also reinforces their understanding of the scientific concepts in the batik-making process.

The exhibition, referred to as "Gelar Karya," features a vibrant program that includes a dance performance by the students, followed by a speech from the principal. This engaging format is designed to celebrate the students' accomplishments and foster a sense of community. The *Batik* exhibition proceeds after the performances, accompanied by teachers' comments and clarifications of the scientific concepts during the batik-making process. It aims to provide enhanced students' learning experiences.

Figure 14. Exhibitions and assessments (*Gelar Karya*)

The implementation of P5 activities at SMP PIRI 1 Yogyakarta was successful, giving a positive impression to both students and teachers. According to interviews conducted with all subject teachers, they noted that P5 facilitates material delivery by associating it to local potential within the surrounding environment. Students also expressed satisfaction with the P5 activities, which enhanced their understanding and provided valuable experiences. The students and the teacher believe that P5 should be continued next time. They found it easier to understand the learning materials. Also, the students' enthusiasm increased as learning shifted from a monotonous classroom setting to more dynamic and outdoor experiences.

P5 activities serve as a platform for students to express and cultivate their interests, talents, and creativity. Furthermore, these activities

encourage students to become more independent and confident in decision-making, thereby enhancing their collaborative skills (Agustina et al., n.d, 2023).

Exploring and documenting themes of local wisdom within P5 activities not only preserves cultural heritage but also instills pride and appreciation for culture. Similar research by Armadani et al. (n.d. 2023) highlights P5 activities focused on local culture, such as the Baralek Gadang wedding celebrations in Solok Regency, West Sumatra, which also included entrepreneurial projects and engineering related to agriculture. The analysis of P5 activities proved that these initiatives can be expanded to include additional themes, enriching the experiences of both students and teachers. The activities facilitate the accumulation of knowledge about the local environment (Setiawan et al., 2017; Wulandari et al., 2020).

Integrating local potential into learning has a significant impact on students' mastery of concepts. Based on the interview, the teacher stated that, "P5 can increase the concept mastery level since it has a science concept in the steps of 'Batik-making.' Meanwhile, the student stated, "I become more understand about some concepts of science." The interview shows that P5 activity in "Batik-making" is the results of the science learning outcomes. Future P5 activities could give benefit from the Ethno-STEM approach, as this ethnoscience perspective could enhance students' understanding of science concepts in the context of batik-making (Izzah et al., 2023). Overall, P5 activities align with the Merdeka curriculum, encouraging students to undertake projects that foster their independence and self-directed learning (Denaya Mehra Syaharani & Achmad Fathoni, 2023).

The success of the P5 activities is closely linked to schools' readiness in implementing the Merdeka curriculum, which is divided into three stages: initial, development, and advanced (Cahyani et al., n.d., 2020). Research indicates the Merdeka curriculum is founded on the Pancasila Student Profile, which focuses on character development and enhancing the learning process across knowledge, attitudes, and skills. Six key aspects support the curriculum: faith, piety, noble morals, diversity, mutual cooperation, independence, critical thinking, and creativity. These elements foster personal character, behavior, and attitudes rooted in local community wisdom (Rachmawati et al., 2022).

P5 activities are designed to reinforce Pancasila values. Strengthening these values requires a holistic learning approach, integrating local wisdom to cultivate national identity and prepare students for global challenges (Fauziah et al., 2023). The Pancasila Student Profile is an ideal for all Indonesian students, which are encouraged to develop. It depends on six interconnected competencies: faith and piety, diversity, collaboration, freedom, critical reasoning, and creativity (Saphira, 2022; Rusnaini et al., 2021).

Schools implementing the Pancasila Student Profile strengthening project report that the curriculum positively influences student motivation. This is partly due to the engaging themes embedded within the curriculum (Javanisa et al., n.d., 2022).

The readiness of teachers and principals is crucial for the effective implementation of this project. Teachers and principals generally exhibit a solid understanding of the Merdeka Curriculum and the Pancasila Student Profile, including its objectives and principles. However, ongoing efforts are necessary to enhance their capabilities in designing and executing relevant projects that align with student interests (Apriana et al., 2024).

The implementation strategy for the Pancasila Student Profile Strengthening Project (P5) includes various approaches to ensure program success and sustainability. A key strategy is the development of an integrated curriculum that embeds Pancasila values into all aspects of learning, creating modules and teaching materials that promote morals, ethics, and citizenship values (Islamiah et al., 2024).

At SMP PIRI 1 Yogyakarta, the implementation of the Pancasila Student Profile includes activities that demonstrate the following values: 1) faith and devotion to God; 2) independence; 3) cooperation; 4) global diversity; 5) critical reasoning; and 6) creativity (Susanti et al., 2023). For example, faith is manifested through *Dhuha* prayer and congregational prayer. Meanwhile, independence is illustrated by students in selecting their *Batik* motifs. Cooperation is

evident in collaborative efforts during batik-making. Global diversity is reflected in the choice of motifs, inspired by biodiversity. Critical reasoning is showcased through students' analyses of scientific concepts in the batik-making process, while creativity is expressed in their unique designs.

Achieving the Pancasila Student Profile fosters a generation with strong capabilities. . Kahfi (2022) emphasizes that the profile aims to preserve noble values and morals, prepare students for global citizenship, promote social justice, and cultivate 21st-century competencies. Integrating theory and practice significantly contributes to developing the competencies necessary for future educators (Bani-Amer, 2022). The result of the study can be applied to other study, such as studies about P5 activity with students' critical thinking skills, because the concept of science has a correlation with the critical thinking skills - the skills has not been discussed in this study.

CONCLUSION

The P5 activity conducted at SMP PIRI 1 Yogyakarta, centered on the theme of local wisdom "*Batik*," effectively integrated various educational components. The activities included *dhuha* prayer and congregational prayer, an opening ceremony, the presentation of local *Batik* wisdom, group division, completion of student worksheets, preparation of tools and materials, creation of *Batik* designs on plain cloth, application of wax according to design, dyeing the waxed cloth, removal of wax, washing, drying, and exhibition and assessment.

This P5 initiative not only engaged students in the rich cultural heritage of *Batik* but also encompassed important scientific concepts, such as biodiversity, changes in states of matter, and the principles of mixtures. Through this hands-on approach, students were able to deepen their understanding of these concepts while appreciating their local culture. The particular study suggests further research to expand to other local wisdom themes or to test the approach in different areas.

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