

Papuan local wisdom and problem-based learning: Integrated into student books and its effect on students' conservation attitudes

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Abstract: Papua, which is known to be rich in local wisdom, has great potential in environmental conservation if supported by a strong conservative attitude from its citizens. This research aims to determine the influence of problem-based student books integrated with Papuan local wisdom on the conservation attitudes of class VII junior high school students. This research is experimental research conducted at junior high schools in the Tanah Merah area of Bintuni Bay. In this study, the sample used was class VII, consisting of 38 students. There were 19 students in the control and experimental classes each. A conservation attitude questionnaire was used to measure students' conservation attitudes. Data were analyzed using the t test. The results show that problem-based student books integrated with Papuan local wisdom have a better effect than the control class. Local wisdom adds to students' information regarding the management of endemic organisms where they live. The problem of extinction in PBL learning empowers students to think about how to conserve organisms so that extinction factors that influence the classification of living things can be prevented.

Keywords: Conservation attitudes, Papuan local wisdom, problem-based learning

Abstrak: Papua yang dikenal kaya akan kearifan lokal mempunyai potensi besar dalam pelestarian lingkungan jika didukung dengan sikap konservatif yang kuat dari warganya. Penelitian ini bertujuan untuk mengetahui pengaruh Buku siswa berbasis masalah terintegrasi kearifan lokal Papua terhadap sikap konservasi peserta didik kelas VII SMP. Penelitian ini merupakan penelitian eksperimen yang dilakukan pada SMP di kawasan Tanah Merah Teluk Bintuni. Pada penelitian ini sampel yang digunakan yaitu kelas VII sebanyak 38 peserta didik sebagai. Siswa pada kelas kontrol dan eksperimen masing-masing berjumlah 19. Angket sikap konservasi digunakan untuk mengukur sikap konservasi siswa. Data dianalisis menggunakan uji t. Hasil menunjukkan bahwa buku siswa berbasis masalah terintegrasi kearifan lokal Papua memiliki efek lebih baik dari kelas kontrol. Kearifan lokal menambah informasi siswa terkait pengelolaan organisme endemik yang ada di tempat tinggalnya. Masalah kepunahan dalam pembelajaran PBL memberdayakan siswa untuk berpikir bagaimana mengkonservasi organisme agar faktor kepunahan yang mempengaruhi klasifikasi makhluk hidup dapat dicegah.

Kata kunci: Sikap konservasi, kearifan lokal Papua, pembelajaran berbasis masalah

INTRODUCTION

In Indonesia, especially in Papua, the level of conservation is still considered low due to careless practices of felling trees and catching endemic animals (Awak et al., 2016; Pattiselanno et al., 2024). The lack of public awareness about the negative impacts of these

activities adds to problems in conservation efforts (Rophi et al., 2024). The need to improve conservation attitudes among the public is urgent to protect biodiversity in the region (Barnes et al., 2024; Levis et al., 2024). Papua, which is known to be rich in local wisdom, has great potential in environmental preservation if supported by a strong conservative attitude from its citizens (Awak et al., 2016; Maruzy & Mujahid, 2019; Prasetyo et al., 2024; Putri & Suroto, 2023; Yapsenang et al., 2022). Many biodiversity conservation decisions are made under severe constraints; for example, part of a species' habitat must be protected or a particular area cannot be included in a conservation area network—exchange is not permitted in relation to such areas (Sarkar et al., 2017).

Protected areas have become an important conservation strategy to protect wildlife; However, illegal activities carried out by local people in and around protected areas can undermine their conservation goals (Castilho et al., 2018). Børresen et al. (2023) recommend that educational programs related to threats to ecosystem services and biodiversity be included in school curricula, especially for students close to protected areas. Educators must be aware of attitudes towards organisms to support the protection of these organisms through learning that focuses on the affective domain (Damopolii et al., 2024). Conservation education must be taught from an early age to students, so that they have a strong foundation for protecting biodiversity (Yunus et al., 2023). Education that teaches biodiversity conservation is a solution for sustainable education.

Effective education and integration of conservation values in everyday life can be the key to changing people's views (Ariya & Momanyi, 2015). By increasing awareness of the importance of protecting living creatures, it is hoped that people will begin to appreciate and protect the natural wealth around them (Badola et al., 2012). These steps are important to ensure long-term protection of living creatures and their habitats. Thus, a strong conservation attitude will not only help in biological conservation but also in ensuring the sustainability of natural resources for future generations (Schönfelder & Bogner, 2017).

Local wisdom passed down from generation to generation is an important aspect in maintaining community cultural identity amidst the inevitable pace of modernization and globalization (Damopolii et al., 2019; Iwan et al., 2020). In Indonesia, especially in Papua, diverse local wisdom plays a crucial role in preserving cultural values and traditions. An example of local Papuan wisdom is "Sasi Laut or Sasisen". Sujarta et al. (2021) have studied that Sasisen or 'Tiyaitiki are local wisdom to maintain the preservation of coastal ecosystems. They found that since elementary school, people in Papua have been introduced to these two local wisdoms. Unfortunately, they further discovered that they only received these two local wisdoms from their parents in the form of fairy tales told directly. They don't get students' knowledge about local wisdom at school, but only from their parents' words. So there is an opportunity for this local wisdom to be presented in the classroom.

Sirait et al. (2024) have integrated Papuan local wisdom into learning to make it easier to identify Papuan sago plants. Papua has local potential which is maintained through local

wisdom, such as medicinal plants (Horota et al., 2023), fish diversity (Rumbruren et al., 2022), even related to religion (Nawas et al., 2022). To understand and study the richness of local wisdom, it is important for us to classify various elements of local wisdom into certain categories. Thus, learning about the classification system of living things which is integrated into the natural sciences curriculum can provide in-depth insight into how local wisdom is structured and maintained. This approach not only enriches local knowledge but also strengthens understanding and appreciation of unique cultural heritage, ultimately supporting conservation efforts in an ever-changing society.

The initial cornerstone in conservation is one's knowledge of the species (Härtel et al., 2023). Classification of living things is an important topic in the Natural Sciences curriculum, which includes learning about grouping living things based on type, genus and genus, as well as treatment methods to prevent extinction. Identifying and classifying living creatures is a conservation strategy to prevent extinction (Permana & Azizah, 2022; Purnomo et al., 2015). This learning process is very useful in improving conservation attitudes among students, helping them develop awareness of environmental sustainability (Kahar & Fadhilah, 2019). Material on the classification of living things can not only be accessed through textbooks and lesson modules, but also through problem-based student books. This problem-based book allows students to be actively involved in solving conservation-related problems (Damopolii et al., 2024), so that they understand not only classification theory but also real-life conservation practices, strengthening their understanding and motivating them to participate in conservation of biodiversity.

Based on the results of observations made at one of Tanah Merah Middle Schools, there are several problems, namely the lack of learning media which still uses textbooks. The level of student understanding in science learning is still low. Students' conservation attitudes are still low, where they catch endemic animals that are threatened with extinction such as cuscus, bird of paradise and throw rubbish carelessly, which has a negative impact on the surrounding environment. From these problems it can be seen that awareness in protecting the environment where they live is still low, meaning their conservation attitude is still low. Based on the results of the observations that have been made, the researchers concluded that these problems can influence students' conservation attitudes so that students' level of knowledge regarding the importance of conservation attitudes towards the surrounding environment is still low. Based on research findings (Damopolii et al., 2024), it was also found that junior high school students still need to improve their conservation attitudes.

Student books as learning textbooks play an important role in the educational process because they contain subject matter and evaluation questions designed to make it easier for students to understand and absorb the lessons taught by the teacher (Rumalolas et al., 2021). According to Nunaki et al. (2014), and Yomaki et al. (2023), the book can be used as an effective supporting tool to improve the smoothness of student learning activities, both in the school environment and at home. Dimopoulos et al., 2008 used books to teach

conservation to students. Student science books have an effect on student attitudes (Klop et al., 2010). Damopolii et al. (2024) problem-based books (books combined with problem-based learning-PBL) are suitable for improving students' conservation attitudes.

The use of PBL in learning has had an impact on increasing students' understanding of conservation. For example, Suhirman and Yusuf (2019) found that PBL had an impact on students' environmental conservation knowledge. The problems presented in learning encourage students to think about how to carry out conservation which increases their knowledge. Lister (2000) explains that PBL is effective in preparing conservation practices to effectively address the indeterminate nature of most conservation problems, ensuring their versatility in various contexts. Rosita et al. (2014) found that PBL also had an impact on students' conservation soft skills. Ratnasari et al. (2022) PBL plus technology-based media has an impact on students' conservation attitudes. Regala (2019) designed a PBL-based book for ecosystem conservation material. He found that PBL can strengthen students' performance regarding environmental issues. Based on the description that has been explained, the researcher used the integrated student book Papuan local wisdom and PBL to investigate its influence on students' conservation attitudes.

METHOD

This research was carried out at junior high schools in the Tanah Merah area, Bintuni Bay, West Papua Province, with the research period being 30 October - 07 December 2023. The research was a quasi-experiment. Non equivalent control group design was used in this research. In this study, the sample used was class VII, consisting of 38 students (19 students in each group, control and experiment). Data was collected using a conservation attitude questionnaire consisting of 17 statements. The questionnaire was adopted from (Damopolii et al., 2024), where the conservation attitude indicator consists of three, namely protection, preservation, utilization, and has a reliability of 0.747. The normality test is needed to find out whether the sample studied is normally distributed or not. This testing stage is very important because subsequent testing depends on this stage. Normality testing is seen from the Kolmogorov Smirnov value. Determination of homogeneity using the Levene test. Hypothesis testing uses the independent samples t test.

RESULTS AND DISCUSSION

This research is experimental research carried out at junior high schools in the Tanah Merah area of Bintuni Bay. This research data is in the form of a questionnaire to measure students' conservation attitudes with a total of 17 statements. This questionnaire was given to students before learning activities (pre) and after learning activities (post).

Table 1. Data normality and homogeneity test

Data		Kolmogorov-Smirnov ^a			Levene Test	
		Statistic	df	Sig.	Statistic	Sig.
Pre-conservation attitude	Control	0.188	19	0.075	0.233	0.632
	Experiment	0.100	19	0.200*		
Post-conservation attitude	Control	0.165	19	0.187	2.291	0.139
	Experiment	0.134	19	0.200*		

Table 1 indicates that the pre-conservation attitude and post-conservation attitude data are normally and homogeneously distributed in both groups. This data has met the testing requirements with the t test.

Table 2. T-test results

Data	t	df	Sig. (2-tailed)
Pre-conservation attitude	-1.780	36	0.084
Posttest	-3.180	36	0.003

Table 2 reveals that before students were involved in learning, their conservation attitudes did not indicate any differences. Changes in students' conservation attitudes occur when they finish engaging in learning. The findings reveal that student involvement in learning that uses local Papuan wisdom and PBL which is integrated into student books has a better impact than those that do not. integrating local wisdom (Agustina et al., 2023) and PBL (Ratnasari et al., 2022) into student books helps train students' conservation attitudes

In this research, the local wisdom used is the wisdom of "Sasi laut or Sasisen". This is local Papuan wisdom that protects living creatures in the sea. With the aim that in the future people will still be able to identify marine organisms and use them. According to Sujarta et al. (2021), and Sumarsono and Wasa (2019), it has been studied that Sasisen and Tiyaiki are local wisdom to maintain the preservation of coastal ecosystems. Mailissa et al. (2021) explains that Papua's coastal and marine areas are diverse and have economic potential. Many types of fish (Tapilatu & Kusuma, 2022), sea cucumbers (Rumlus et al., 2015), microalga (Purbani et al., 2019), and others. Papuan local wisdom is taught so that students can improve their attitudes towards conserving this diversity so that it does not become extinct. Awareness of conservation can be increased by integrating local wisdom in teaching it (Chaichana et al., 2019). Sasi local wisdom as community cultural capital has become a foundation and strategic issue related to the protection of marine and coastal natural resources in supporting and maintaining them (Mentansan et al., 2023).

Apart from that, other species are also introduced when students classify living things such as the Papuan bird of paradise (Cenderawasih), the Arfak mountain butterfly (Manihuruk et al., 2020), red fruit (Wawo et al., 2019), and Papuan black fruit (Ungirwalu et al., 2018). These species are presented in the book with information on their taxonomic composition. Wawo et al. (2019) explained that red fruit conservation is carried out by the

Wamena Biological Botanical Gardens ex-situ. By teaching and classifying these species, teachers have taught students to prevent these species from being recognized and not becoming extinct. Behavioral intentions focus primarily on protection and prevention, which underscores the need to anchor conservation in schools and thereby increase students' commitment to preserving nature and the environment (Christ & Dreesmann, 2023).

Human concern for species in nature can be determined by measuring their attitudes towards conservation (Putri et al., 2021). In fact, the high biodiversity that exists in indigenous regions throughout the world is the result of traditional knowledge and management practices (Diegues, 2014). The human population continues to increase and biodiversity is declining rapidly (Kopnina et al., 2022). One of the classification problems is extinction. So in this research, the problem of extinction becomes a support for implementing PBL. In PBL, the initial activity is giving problems to students (Damopolii & Kurniadi, 2019; Zannah et al., 2022). Figure 1 is a snapshot of the problem of extinction of the little Cenderawasih bird.

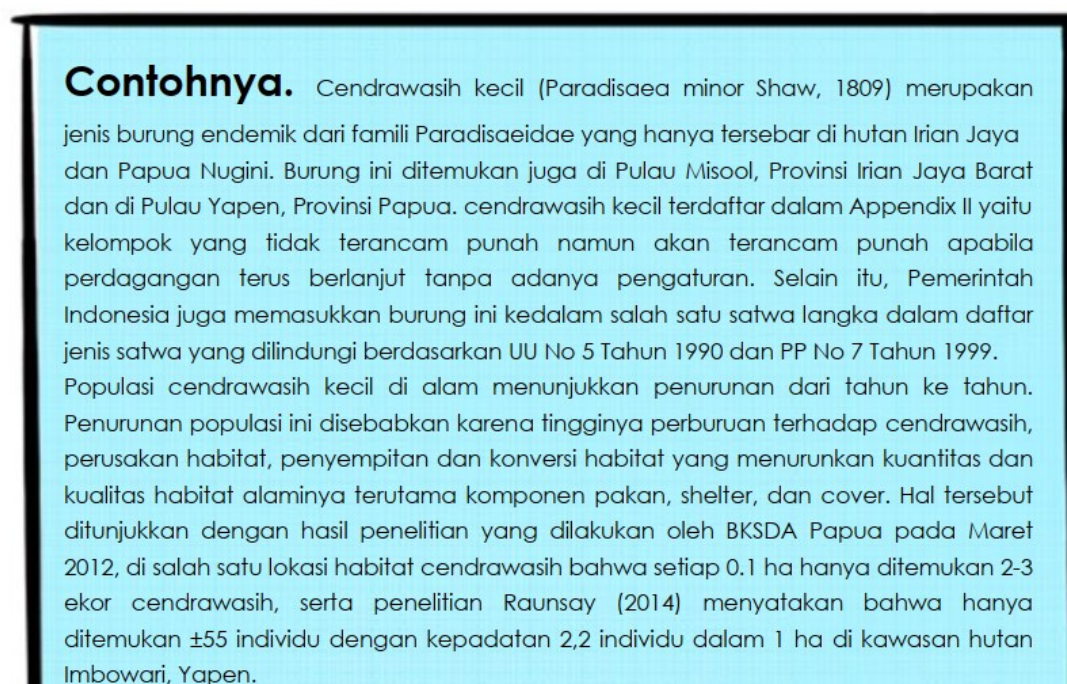


Figure 1. The problem of the extinction of the Cenderawasih bird of Papua in student books

The problem presented in Figure 1 teaches students to understand how extinction is one of the factors that influence classification. So that empowerment of conservation attitudes is carried out in this research so that students in the future can carry out conservation, especially endemic Papuan animals. According to Pattiselanno et al. (2015) modern hunting has displaced traditional hunting which has resulted in species overcrowding in Papua. However, valuable information from local wisdom is that it provides students with knowledge to protect marine species from the threat of extinction. Students' knowledge of environmental protection has an effect on their conservation attitudes (Mohiuddin et al.,

2018). Research has proven that the integration of local wisdom and PBL into students' books has an impact on improving students' conservation attitudes compared to classes that do not use this learning.

CONCLUSION

This research concludes that the integration of local Papuan wisdom and PBL can improve students' conservation attitudes. Local wisdom adds to students' information regarding the management of endemic organisms where they live. The problem of extinction in PBL learning empowers students to think about how to conserve organisms so that extinction factors that influence the classification of living things can be prevented. Local wisdom and PBL are a combination that can be used by teachers to empower their students' conservation attitudes.

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