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Junior High School Students' Knowledge of the Local Wisdom of Rawa Pening Lake in Relation to Science Learning Materials

Tabita Puspa Cahyani [1], Susanti Pudji Hastuti [1*], and Natalia Rosa Keliat [1]

[1] Department of Biology Education, Faculty of Biology, Satya Wacana Christian University, Jl. Diponegoro No. 52-60, Salatiga, Sidorejo, Salatiga City, Central Java, Indonesia, 50711
* Correspondence: susanti.hastuti@uksw.edu

Abstract

Background: Local wisdom is ideas in an area that are wise, valuable, and become a tradition and are followed by the people there. By integrating local wisdom into the learning process, students will gain a more meaningful and real-world experience, highlighting the importance of preserving local wisdom. This research aims to determine the level of knowledge among junior high school students around Rawa Pening Lake regarding the local wisdom of Rawa Pening Lake in relation to science learning materials. **Method:** The type of research used is quantitative descriptive research. The subjects of this research were junior high school students in class VIII around Rawa Pening Lake. The data collection techniques used are observation, interviews, tests, and documentation. The instruments used were interview sheets and test questions. The data analysis used is to analyze student test scores. The local wisdom surrounding Rawa Pening Lake is rooted in tradition and the sustainable use of natural resources. **Result:** Based on the results of the analysis of students' knowledge about the local wisdom of Rawa Pening lake, it was found that 83% (231 student) were in the "poor" category, 15% (41 student) were in the "sufficient" category, 3% (8 student) were in the "good" category, and no students were found who knew the "excellent" category. **Conclusion:** Recommendations for learning strategies based on local wisdom can be carried out through project-based learning, folklore-based learning, and nature-based learning.

Keywords: Local Wisdom; Rawa Pening Lake; Science Learning Materials

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Introduction

Education is a means for each individual to develop insight, knowledge, values, character, and foster cultural inculcation. According to Adawiyah et al. (2023), education is not only necessary for developing human intellect but also for transforming aspects of human personality, including faith, morals, mentality, behavior, and attitudes. According to Fitri (2021), education is a means for humans to develop their potential through the learning process.

Natural Science (IPA) subjects encompass not only theoretical concepts but also the real-world experiences necessary to develop competencies. Through science learning, students are expected to integrate knowledge with their surrounding environment. According to Meryastiti et al. (2022), science learning emphasizes students' active involvement in understanding and observing the natural world through scientific methods. Science is a subject that aims to acquire knowledge, skills, and foster a positive attitude while implementing scientific concepts and understanding natural phenomena. Therefore, science is a discipline capable of accommodating natural phenomena, which students can learn through discovery or direct observation. According to Saputri & Desstya (2023), the science learning process can be conducted in nature by observing phenomena occurring in one's own environment through local wisdom.

Local wisdom refers to the values and perspectives of a local community that are wise, prudent, and serve as guidelines for society (Suwardi & Rahmawati, 2019). According to Istiawati (2016), local wisdom can be defined as a teaching about life supported by positive elements. Local wisdom can be defined as a community's collective effort within a region to develop attitudes and actions toward events or objects that occur, drawing on their own local knowledge and experience. Local wisdom can be defined as ideas within a region that are imbued with wisdom, meaningful, and have become traditions, followed by the community within it. This local wisdom contains rules and benchmarks that serve as recommendations and guidelines for community life. Local wisdom plays a role in maintaining the culture of a region and serves as a means of presenting the region's identity. Therefore, local wisdom can also be defined as the uniqueness of an area, whether from a cultural, economic, or ecological perspective. According to Mimin (2023), local wisdom is implemented as local intelligence, serving as a guideline for community life and being preserved because it plays a positive role in daily life.

According to Oktaviani & Halim (2021), the diversity of cultures in a region makes it challenging to maintain traditions due to the influx of cultural changes, so local culture must be preserved. Therefore, it is necessary to strengthen character education based on local wisdom in the current generation as an effort to protect local culture (Iswatiningsih, 2019). Local wisdom is one means of preserving customs and culture in the surrounding environment. By integrating local wisdom into the learning process, students will gain meaningful and authentic experiences with the local wisdom of their respective regions, which must be preserved. Naryatmojo (2019) explains that local wisdom plays a valuable role when implemented in the learning process. Integrating local wisdom in learning can stimulate students to understand the nature and culture in their environment. Albantani & Madkur (2018) identified several key characteristics of local wisdom, including its ability to preserve culture, its capacity to support native cultures against foreign influences, and its potential to guide the direction of cultural progress. According to Romadi & Fitri (2017), the implementation of local wisdom in Indonesia, through philosophy and outlook on life, encompasses various aspects of life, such as social values, economics, architecture, and environmental management.

Integrating learning materials with the surrounding environment will facilitate students' integration of knowledge into their minds (Fauzi, 2022). According to Saputra et al. (2016), science learning can also be linked to local wisdom, as science subjects can accommodate natural phenomena, including cultures and local wisdom within communities. Local wisdom-based education teaches students to be responsive to the concrete situations they face (Rummar, 2022).

Managing local wisdom-based learning within the learning process can be an alternative way to preserve nature and culture in the surrounding environment. Teaching materials that integrate local wisdom will enhance students' understanding of the subject matter. Integrated thematic learning based on local wisdom is a type of learning that incorporates local wisdom relevant to the students' environment, thereby making the learning experience more contextual (Anwar et al., 2023). Local wisdom can be considered a supporting effort for environmental conservation. Therefore, learning is expected to incorporate science material rooted in local wisdom. Local wisdom, as a wise set of rules, needs to be preserved, meaning it needs to be passed down to the next generation to prevent extinction (Damayanti et al., 2013).

Rawa Pening Lake is a semi-natural lake located in Semarang Regency. Astronomically, Rawa Pening Lake is situated at 7° 40’ South Latitude – 7° 30’ South Latitude and 110° 24’46” East Longitude – 110° 49’06” East Longitude. It is surrounded by four districts: Tuntang, Bawen, Ambarawa, and Banyubiru. Located 45 km south of Semarang and 9 km northeast of Salatiga, Lake Rawa Pening is situated in the growth triangle of Yogyakarta, Solo, and Semarang (Soeprobowati & Suedy, 2010). Rawa Pening Lake holds significant ecological, historical, and economic value.

Rawa Pening Lake serves as a habitat for aquatic organisms, including various fish species. Its abundant water potential is utilized for irrigating the surrounding rice fields. In terms of ecotourism, Lake Rawa Pening has potential, including recreational uses and culinary businesses in the surrounding area. The natural resources of Lake Rawa Pening include water hyacinth and peat soil. Communities around Lake Rawa Pening utilize water hyacinth for crafts, and the peat soil serves as fertilizer and a growing medium for mushrooms.

Several forms of local wisdom are still found around Lake Rawa Pening, including the traditions of "sedekah rawa," "merti dusun," and "bersih rawa." Furthermore, several forms of local wisdom exist, such as the use of traditional, environmentally friendly fishing gear. The local wisdom of Lake Rawa Pening can be directly linked to science topics such as ecosystem diversity, organism life cycles, biodiversity, the use of medicinal plants, natural resource management, environmental pollution, and the development of natural resource-based products. For example, in the natural resource management lesson, teachers can relate the use of water hyacinth for home crafts.

This research is essential to be conducted because it will contribute to the field of education and the surrounding environment, such as preserving local wisdom for future generations, increasing environmental awareness, increasing pride in local culture, improving the quality of education, teaching students to protect local wisdom, and developing an understanding of the importance of conservation. Local wisdom integrated into the learning process will provide students with authentic experiences of the environment and culture in their area, enabling them to interpret and preserve the environment and culture in their surroundings through the local wisdom that has been passed down. Based on this, the purpose of this study is to determine the knowledge of junior high school students about the local wisdom of Rawa Pening Lake in relation to science learning materials.

Methods

The research used a quantitative descriptive study using a survey method. The study was conducted from October 2023 to May 2024 at junior high schools around Lake Rawa Pening.

Participants

The subjects of this study were eighth-grade junior high school students from schools around Lake Rawa Pening within a 4-kilometer radius of the lake. The population size of this study was 936 students. The sample size consisted of 280 students from the eight schools used in this study: At Tohari Tuntang Plus Islamic Junior High School, Lentera Ambarawa Christian Junior High School, Ambarawa 2 Junior High School, Ambarawa 4 Junior High School, Banyubiru 1 Junior High School, Banyubiru 2 Junior High School, PGRI Banyubiru Junior High School, and Sudirman Banyubiru Islamic Junior High School. The respondent collection technique used the Slovin formula with a 5% margin of error.

$$n = \frac{N}{1 + N(e)^2}$$

Description:
n: sample size
N: population size
e: sampling error rate (level of error)

Instruments

The research instrument consisted of a multiple-choice test with 35 questions. The test and interview instruments were developed by defining the objectives, determining the test format, creating a questionnaire, writing the questions, and conducting validation. Subject matter experts and language experts validated the test instrument. The validation results indicated that the instrument was suitable for use. Additionally, other research instruments

included interview questions with eight teachers and 12 community members around Lake Rawa Pening. The majority of the interviewees worked as fishermen and village officials, aged 35-62.

Data Collection

Data collection techniques used tests, interviews, and documentation.

Procedure

The research procedure began with determining the topic and title of the research, followed by selecting the research subjects. Next, the researchers conducted a field survey, interviewing fishermen and village officials to determine the local wisdom still practiced by the local community. The next step was to develop a science test instrument containing questions about the values of local wisdom and administer it to the students who were the research subjects.

Data Analysis

The data analysis stage was conducted using a percentage-based technique, based on the scores obtained by the students.

Result

The people around Rawa Pening Lake make their living as fishermen. Some examples of local wisdom around Rawa Pening Lake, based on interviews with fishermen and community members related to cultural preservation, include the traditions of swamp almsgiving, swamp cleaning, and village merit. Other local wisdom found around Rawa Pening Lake consists of the use of environmentally friendly fishing gear. Interviews revealed that fishermen no longer use poison or explosives to catch fish. Fishing gear used includes nets, fishing rods, branjang, bubu (bubu), seser, and sodo. Communities around Rawa Pening Lake typically use bubu to catch tilapia, catfish, lobster, swamp betta, wader (seasonal), chana fish, and snakehead. Sodo is used to catch rebon shrimp, while seser is used to catch snails.

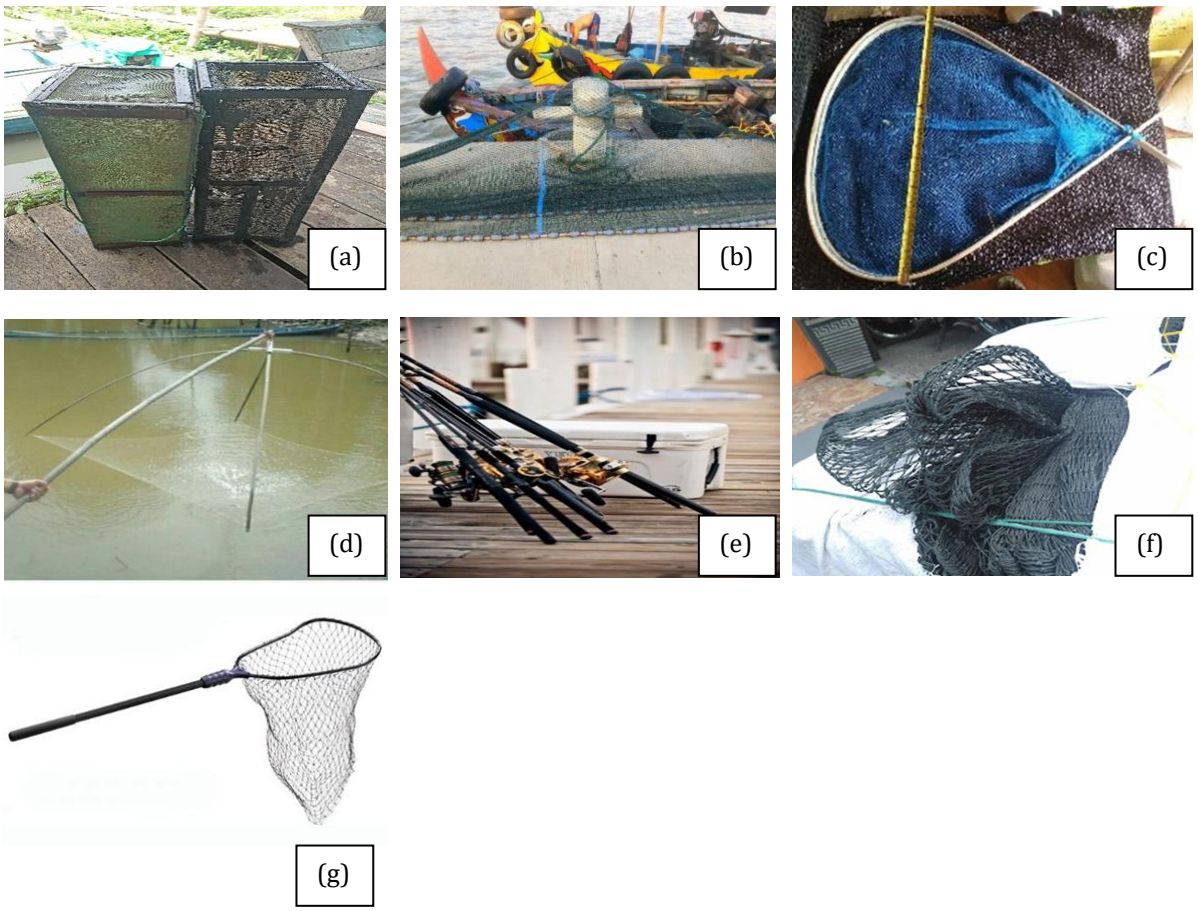

Figure 3. Fishing Tools (a) Bubu or icir (Tabita, 2023); (b) Sodo (c) Seser (d) Branjang (e) Fishing Rod f) Net; (g) Net

Based on the analysis of students' knowledge about the local wisdom of Lake Rawa Pening, the average score was only 53.14, categorized as "poor." Students' knowledge of the local wisdom of Lake Rawa Pening is presented in Table 1.

Table 1. Junior High School Students' Knowledge of the Local Wisdom of Lake Rawa Pening

Value	Category	Frequency	Percentage
93-100	Excellent	0	0,00%
84-92	Good	8	3,00%
75-83	Enough	41	15,00%
<75	Poor	231	83,00%

Table 1 shows that 231 students (83.00%) categorized their knowledge of the local wisdom of Lake Rawa Pening as "enough," while 41 students (15.00%) categorized their expertise as "good." Only eight students (3.00%) achieved the "good" category, and no students completed the "excellent" category.

Based on the lower cognitive levels (C1-C2), an interesting finding emerged. Table 2 presents students knowledge of local wisdom at the lower cognitive level.

Table 2. Junior High School Students Knowledge of the Local Wisdom of Lake Rawa Pening at the Lower Cognitive Level

Value	Category	Frequency	Percentage
93-100	Excellent	1	0,36%
84-92	Good	19	6,79%
75-83	Enough	28	10,00%
<75	Poor	232	82,86%

Table 2 shows that 232 students (82.86%) categorized their knowledge of the local wisdom of Lake Rawa Pening at the lower cognitive level as "enough." Twenty-eight students (10%) achieved the "good" category, and only 19 students (6.79%) completed the "good" category. Only one student (0.36%) achieved the "excellent" category.

Based on the medium cognitive level (C3-C4), it is evident that students' knowledge of the local wisdom of Lake Rawa Pening remains low. Table 3 presents students' knowledge of local wisdom at the medium cognitive level.

Table 3. Junior High School Students' Knowledge of the Local Wisdom of Lake Rawa Pening at the Medium Cognitive Level

Value	Category	Frequency	Percentage
93-100	Very Good	0	0,00%
84-92	Good	11	4,00%
75-83	Enough	11	4,00%
<75	Poor	258	92,00%

Based on Table 3, the data shows that students' knowledge of the local wisdom of Lake Rawa Pening is at the medium cognitive level, with 258 students (92.00%) categorized as "enough." Eleven students (4.00%) each received the "good" and "enough" categories, and no students received the "excellent" category.

Based on the high cognitive level (C5-C6), it is evident that students' knowledge of the local wisdom of Lake Rawa Pening remains low. Table 4 presents students' knowledge of local wisdom at the high cognitive level.

Table 4. Junior High School Students' Knowledge of the Local Wisdom of Lake Rawa Pening at a High Cognitive Level

Value	Category	Frequency	Percentage
93-100	Excellent	138	49,00%
84-92	Good	0	0,00%
75-83	Enough	0	0,00%
<75	Poor	142	51,00%

Based on Table 4, the data show that 142 students (51.00%) ranked their knowledge of the local wisdom of Lake Rawa Pening at a high cognitive level, with 138 students (49.00%) categorizing their understanding as "excellent." No students were found to have reached the "enough" or "good" categories.

Discussion

Local wisdom is a perspective on life and knowledge, as well as diverse life strategies, expressed in the activities undertaken by local communities to meet their needs. According to Oktaviani & Halim (2021), the diversity of cultures in a region makes it difficult to maintain traditions due to the influx of cultural change. Therefore, local wisdom must be preserved. Some examples of local wisdom around Lake Rawa Pening, based on interviews with fishermen and the community, related to cultural preservation, include the traditions of "Sedekah Rawa," "Bersih Rawa," and "Merti Dusun."

Sedekah rawa is a symbolic tradition of offering crops to the lake as a form of respect for ancestors and gratitude for the blessings of natural resources. The Sedekah rawa ceremony involves preparing a giant tumpeng (rice cone) and a variety of foods, consisting of crops and side dishes, such as ingkung (rice cake), to be floated into the lake. According to Zuliyanti (2022), environmental values are evident in the selection of environmentally friendly food as offerings for Thanksgiving. The interaction between the community and the environment of Rawa Pening Lake can be used as material in science lessons to understand the interactions between living things and their environment.

Another type of local wisdom found in Rawa Pening Lake is swamp cleaning. This swamp cleaning tradition is practiced by the communities surrounding Rawa Pening Lake to address the exploding water hyacinth population in the lake. This swamp cleaning tradition is carried out through cooperation by fishermen, who clean the lake of water hyacinth. This activity involves cutting the water hyacinth to prevent it from obstructing fishing boat traffic. This swamp cleaning activity can contribute to the environmental sustainability of Rawa Pening Lake.

Merti Dusun is a tradition generally held after the harvest at Rawa Pening Lake. This tradition includes celebrations, religious studies, wayang (wayang) performances, and tumpeng (rice cone) dishes that utilize the existing natural resources. During this celebration, various types of fish caught by fishermen and plants native to Rawa Pening Lake are prepared and eaten together.

Pranata mangsa is the traditional knowledge of the Central Javanese people regarding seasonal rules, which are generally used to understand ancestral wisdom, especially environmental wisdom (Harini et al., 2019). Although traditional, pranata mangsa shares similarities with elements of modern knowledge. The determination of pranata mangsa is the division of one year into 12 periods. According to Rimanang (2016), one of the mangsa in pranata mangsa is mangsa kapitu: palguna, which lasts from December 22 to February 2. The benefit of understanding pranata mangsa in learning is that students can learn the characteristics of nature during mangsa kapitu, which is identical to the rainy season, and farmers will begin planting rice. Local wisdom in pranata mangsa lies in determining the season for planting rice according to the Javanese calendar.

Another example is the mangsa kasa-kartika or mangsa satu, marked by the leaves starting to fall and the appearance of grasshoppers that begin to make burrows and lay eggs. Based on the results of interviews with fishermen and local communities, it is known that pranata mangsa around Lake Rawa Pening is rarely practiced due to seasonal changes.

Furthermore, the pranata mangsa (prey system) is seldom practiced due to technological advancements. The Independent Curriculum (Curriculum Merdeka) introduces the Pancasila Student Profile Strengthening Project (P5) as an effort to explore local wisdom in the learning approach (Kemendikbudristek, 2020). Science learning materials integrated with local wisdom are an effective way to make learning more contextual and relevant for students.

Nadlir (2014) states that learning can be facilitated by connecting it to concrete situations that students encounter daily. Activities students can undertake include conducting research projects on types of fishing gear, their impacts on biodiversity, and mitigation efforts.

Other local wisdom around Lake Rawa Pening includes knowledge of traditional, sustainable methods of utilizing natural resources or local potential. Communities around Lake Rawa Pening also use the potential of plants such as aloe vera and betel, as well as peat soil, in their daily lives.

Aloe vera is one of the family medicinal plants (TOGA) cultivated by the community around Lake Rawa Pening. Aloe vera plants are commonly used as an alternative first aid treatment for injuries, such as burns and cuts (Kulsum & Sutriningsih, 2020). Furthermore, betel plants are often chewed by mixing them with gambier, areca nut, and lime. This tradition has been passed down through generations. Observations have shown that people who practice this tradition have stronger teeth. According to Hermanto et al. (2023), betel plants have a distinctive aroma due to their kavikol content. Kavikol acts as a more potent antibacterial than phenol.

Besides betel, water hyacinth is also widely used by the people around Lake Rawa Pening. According to Seftyono (2014), water hyacinth is a plant species commonly found around Lake Rawa Pening. The people around Lake Rawa Pening can utilize the large population of water hyacinth for crafts.

The use of water hyacinth is related to environmental conservation. Excessive populations of water hyacinth impact water quality and biodiversity. Excessive water hyacinth can block sunlight from entering the water, which is essential for photosynthetic organisms at the bottom. This can disrupt the balance of the aquatic ecosystem and reduce biodiversity. When water hyacinths die and decompose, their organic matter falls to the bottom of the swamp, causing sedimentation, which ultimately leads to the silting of Lake Rawa Pening. This silting can reduce water volume and swamp depth, leading to habitat loss for various flora and fauna species. Organisms that depend on the deep lake ecosystem will be affected and may experience population declines. Abimanyu et al. (2016) stated that water hyacinth is a nuisance because it reduces the fish population due to the smell and pollution of the lake water. Fishing equipment can also be damaged if caught in the water hyacinth.

Lake Rawa Pening also produces peat soil. Peat soil is a type of soil formed from the accumulation of organic matter, particularly plant debris that has not fully decomposed due to wet and anaerobic environmental conditions (Mahdiyah, 2015). Nugroho et al. (2008) stated that peat soil is formed from plant debris and is characterized by brown to blackish color and fiber. Peat soil is usually harvested by farmers using rakes and hoes. Local communities use the peat soil to sell directly to collectors, and some use it as a growing medium for mushrooms. The waste can be used to make organic fertilizer and briquettes. This is in accordance with the statement by Abimanyu et al. (2016), who explained that peat miners search for peat soil in the middle of the lake using motorized boats, and the tools used are hoes and rakes.

Several factors contribute to students' lack of knowledge about the local wisdom of Lake Rawa Pening. One contributing factor is the inadequate implementation of local wisdom integration into the curriculum. Although the curriculum used in all schools studied used the Merdeka curriculum, which serves as a platform for educators to implement local wisdom in their respective regions into their learning, this finding aligns with the statement by Anwar et al. (2023), who stated that integrated thematic learning based on local wisdom integrates local wisdom relevant to the students' environment, thus making learning contextual. However, in some schools, the implementation of this local wisdom is limited to the

Pancasila Student Profile Strengthening Project (P5), which incorporates local wisdom topics.

Limitations in integrating local wisdom in the implementation of the Pancasila Student Profile Strengthening Project (P5) include limited resources, such as the availability of books, infrastructure, and human resources. This is consistent with Pratama & Febriani (2024), who explained that the implementation of the P5 project faced obstacles, including a lack of student participation and inadequate facilities. Interviews with several teachers at the school revealed that some schools have utilized the local potential and local wisdom of Lake Rawa Pening in their P5 projects, such as making briquettes using water hyacinth. However, the textbooks and teaching materials used by students do not yet address local wisdom. Consequently, students are not fully aware of the local wisdom in their area, particularly around Lake Rawa Pening. Modernization and globalization also contribute to students' low knowledge of local wisdom. The currents of modernization and globalization cause students to focus on current changes and overlook, or even become unaware of, the cultural richness, utilization of local potential, and local wisdom in their area.

The results of this study indicate that students' knowledge of the local wisdom of Lake Rawa Pening remains inadequate. Several approaches can be taken to enhance students' knowledge of local wisdom, including maximizing the integration of local wisdom into the curriculum, providing learning resources and references, teacher training and development, collaboration with indigenous communities or the broader community, and conducting interactive and multidisciplinary learning. Especially in science learning, local potential and local wisdom can be effectively implemented in science subjects. Therefore, through the potential and local wisdom that exist around Lake Rawa Pening, such as water hyacinth plants, the use of fishing gear, and peat soil, these can be utilized as objects of student learning that integrate local wisdom and local potential in science subjects. Local wisdom, as one of the wise rules, needs to be preserved, meaning it needs to be passed on to the next generation so that it does not become extinct (Damayanti et al., 2013).

Integrating culture with science learning is a step towards reintroducing and preserving existing culture and providing students with a means to recognize local wisdom that can benefit their surroundings. One approach to learning that can be applied is culturally responsive learning. Culturally responsive learning is an educational approach that recognizes and leverages students' cultural diversity as a valuable asset in the teaching and learning process (Hardiana, 2023). According to Lasminawati et al. (2023), through a culturally responsive teaching approach, students are able to see the connection between scientific concepts and their daily lives and cultural contexts. This makes science learning more realistic, valuable, and applicable to everyday life.

Large-wisdom-based learning in education, including in science subjects, is crucial for providing a relevant context and enriching students' learning experiences. Linking science concepts to local wisdom in their respective regions can help students understand how scientific knowledge is applied in real-life situations. For example, local knowledge about medicinal plants and families can help students understand the potential benefits of biodiversity. Pamungkas et al. (2017) explain that a local wisdom-based science learning model focuses on integrating the values of a community's local wisdom into the science learning materials. Pingge (2017) explains that local wisdom-based education must begin with the collection of various types of local wisdom and then apply them to the learning process.

This local wisdom-based learning provides real-life experiences that are relevant to students' lives. For example, students can learn about ecosystems through their surrounding environment, such as Lake Rawa Pening and its components. Nadlir (2014) states that local wisdom-based education is a concrete implementation of concrete situations that students must face. Local wisdom-based learning also teaches students to understand and appreciate the culture and traditions of their region. This can be implemented when teaching students about the use of traditional medicinal plants, which not only teaches scientific knowledge but also fosters pride in local culture and wisdom.

Local wisdom-based learning is also inseparable from positive values such as cooperation, harmony with nature, and sustainability, for example, through traditions found in the communities surrounding Lake Rawa Pening, such as the "Sedekah Rawa" (rab almsgiving), "Merti Dusun" (village clean-up), and "Bersih Rawa" (swamp cleaning). These traditions are carried out collaboratively, with a focus on preserving the surrounding environment. Students can learn about cooperation and responsibility for environmental preservation through the local wisdom of their region. Andriana et al. (2017) explain that learning based on local wisdom teaches students to develop a love for the environment and to preserve it by utilizing existing knowledge.

Locative wisdom-based learning is more interactive, involving students in various activities. One example involves students and teachers conducting field research on natural resource management practices in Lake Rawa Pening, including the control of water hyacinth and the use of peat soil. According to Kumala & Sulistyowati (2016), integrating learning with local wisdom enables the application of regional cultural elements in the learning process. For example, through the local wisdom of the pranata mangsa tradition, students can learn about weather and climate.

Irpan et al. (2024) also note that the implementation of local wisdom-based teaching materials successfully met the research objectives, achieving a 90% completion rate. The implication of this research is the importance of a learning approach focused on local wisdom in strengthening students' cultural identity and preserving local cultural heritage. This research informs the development of basic education curricula and learning designs that are relevant and contextually appropriate for students.

Conclusions

Based on the research results, it was concluded that: (1) Students' knowledge of the local wisdom of Rawa Pening Lake only reached an average value of 53.14, which is included in the poor category. (2) Local wisdom in Rawa Pening Lake includes traditions carried out by the surrounding community, such as swamp alms, village merti, and swamp alms. In addition, the community's utilization of local potential and wisdom includes the use of typical plants from Rawa Pening Lake and the use of traditional fishing gear. (3) The integration of local wisdom of Rawa Pening Lake into the learning process has not been widely carried out by schools around Rawa Pening Lake. (4) Recommendations for learning strategies based on local wisdom can be carried out through project-based learning, folklore-based learning, and nature-based learning.

Declaration statement

The authors report no potential conflict of interest.

References

Abimanyu, K., Banowati, E., & Aji, A. (2016). Analisis Pemanfaatan Sumber Daya Alam Danau Rawa Pening Kabupaten Semarang. *Journal Unnes*, *5*(1), 1–7. https://doi.org/10.15294/geoimage.v5i1.11315

Adawiyah, R., Asbari, M., & Damayanti, M. S. (2023). Tiga Level Proses Belajar Efektif: Fundamental, Insightful Knowledge, Specific Skill. *Jurnal Manajemen Pendidikan*, *01*(02), 339–342. https://doi.org/10.70508/literaksi.v1i02.394

Albantani, A. M., & Madkur, A. (2018). Think Globally, Act Locally: The Strategy of Incorporating Local Wisdom in Foreign Language Teaching in Indonesia. *International Journal of Applied Linguistics and English Literature*, *7*(2), 1. https://doi.org/10.7575/aiac.ijalel.v.7n.2p.1

Andriana, E., Vitasari, M., Oktarisa, Y., & Novitasari, D. (2017). Pengembangan Multimedia Pembelajaran IPA Berbasis Kearifan Lokal di Sekolah Dasar. JPSD (Jurnal Pendidikan Sekolah Dasar), *3*(2), 186–200. https://doi.org/10.30870/jpsd.v3i2.2139

Anwar, F. N., Chotimah, C., & Pani, Y. S. (2023). Pengembangan Modul Berbasis Kearifan Lokal Kabupaten Sanggau Subtema Lingkungan Tempat Tinggalku Pembelajaran 3 Kelas IV. *Jurnal Cakrawala Ilmiah*, *2*(6), 2817–2828. https://doi.org/10.53625/jcijurnalcakrawalailmiah.v2i6.5148

Damayanti, C., Dewi, N. R., & Akhlis, I. (2013). Pengembangan CD Pembelajaran Berbasis Kearifan Lokal Tema Getaran dan Gelombang untuk Siswa SMP Kelas VIII. *Unnes Science Education Journal*, *2*(2), 274–281. https://journal.unnes.ac.id/sju/index.php/usej/article/view/2036

Fauzi, M. (2022). *Meta Analisis Pengaruh Pengintegrasian Kearifan Lokal dalam Pembelajaran IPA dan Fisika Terhadap Hasil Belajar*. *8*(1), 72–81. https://doi.org/10.24036/jppf.v8i1.116478

Fitri, S. F. N. (2021). Problematika Kualitas Pendidikan di Indonesia. *Jurnal Pendidikan Tambusai*, *5*, 1617–1620. https://www.jptam.org/index.php/jptam/article/view/1148/1029

Hardiana, D. (2023). Peningkatan Minat Belajar IPAS melalui Culturally Responsive Teacing pada Peserta Didik Kelas IV SDN 01 Sumbersari. *Jurnal Ilmiah PGSD FKIP Universitas Mandiri*, *09*, 2394–2405. https://doi.org/10.36989/didaktik.v9i2.983

Harini, S., Sumarmi, & Wicaksono, A. G. (2019). Manfaat Penggunaan Pranata Mangsa bagi Petani Desa Mojoreno Kabupaten Wonogiri. *Jurnal Inada*, *2*(1), 82–97.

Hermanto, L. O., Nibenia, J., Sharon, K., & Rosa, D. (2023). Review Artikel : Pemanfaatan Tanaman Sirih (Piper betle L.) Sebagai Obat Tradisional. *PHRASE (Pharmaceutical Science)*, *3*(1). http://dx.doi.org/10.52031/phrase.v3i1.502

Irpan, Sutisnawati, A., & Maula, L. H. (2024). Penerapan Materi Ajar Berbasis Kearifan Lokal untuk Meningkatkan Pemahaman Budaya pada Siswa Sekolah Dasar Negeri Cikarang Kelas III. *Journal of Elementary Education*, *07*(02), 257–263. https://doi.org/10.22460/collase.v7i2.22546

Istiawati, N. F. (2016). Pendidikan Karakter Berbasis Nilai-Nilai Kearifan Lokal Adat Ammatoa dalam Menumbuhkan Karakter Konservasi. *Jurnal CENDEKIA*, *10*(1), 1–18. https://doi.org/10.30957/cendekia.v10i1.78

Iswatiningsih, D. (2019). Penguatan Pendidikan Karakter Berbasis Nilai-Nilai Kearifan Lokal di Sekolah. *Jurnal Satwika*, *3*(2), 155. https://doi.org/10.22219/satwika.vol3.no2.155-164

Kulsum, D., & Sutriningsih. (2020). Uji Aktivitas Luka Insisi dengan Ekstrak Etanol 70% Lidah Buaya (Aloe vera L) terhadap Proses Penyembuhan Luka pada Mencit Putih Jantan (*Mus musculus L.*). *Indonesian Natural Research Pharmaceutical Journal*, *5*(2), 83–101. https://doi.org/10.47065/jharma.v4i3.4415

Kumala, F. N., & Sulistyowati, P. (2016). *Pengembangan Bahan Ajar IPA Berbasis Kearifan Lokal*. https://semnas.unikama.ac.id/lppm/prosiding/2016/PENELITIAN/PENDIDIKAN DAN BUDAYA/Farida Nur Kumala dan Prihatin Sulistyowati-penelitian-unikama.pdf

Lasminawati, E., Kusnita, Y., & Merta, I. W. (2023). Meningkatkan Hasil Belajar dengan Pendekatan Pembelajaran Culturally Responsive Teaching Model Problem Based Learning. *Journal of Science and Education Research*, *2*(2), 44–48. https://doi.org/10.62759/jser.v2i2.49

Mahdiyah, D. (2015). Isolasi Bakteri dari Tanah Gambut Penghasil Enzim Protease. *Jurnal Pharmascience*, *2*(2), 71–79. https://doi.org/http://jps.ppjpu.unlam.ac.id/

Meryastiti, V., Ridlo, Z. R., & Supeno. (2022). Identifikasi Kemampuan Berpikir Kritis pada Pembelajaran Siswa SMP Negeri 1 Glenmore Kabupaten Banyuwangi. *Jurnal Saintifika*, *24*(1), 20–29. https://doi.org/10.19184/saintifika.v24i1.29659

Mimin, E. (2023). Pentingnya Nilai-Nilai Kearifan Lokal Suku Ngalum Ok dalam Kurikulum PAUD guna Menghasilkan Siswa Berkepribadian Unggul. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *7*(4), 4500–4512. https://doi.org/10.31004/obsesi.v7i4.3984

Nadlir. (2014). Urgensi Pembeljaran Berbasis Kearifan Lokal. *Jurnal Pendidikan Agama Islam*, *2*(2), 300–330. https://doi.org/10.15642/jpai.2014.2.2.299-330

Naryatmojo, D. L. (2019). Internalization the Concept of Local Wisdom for Students in the Listening Class. *Arab World English Journal*, *10*(1), 382–394. https://doi.org/10.24093/awej/vol10no1.31

Nugroho, U., Sipil, J. T., & Teknik, F. (2008). Stabilisasi Tanah Gambut Rawa Pening dengan Menggunakan Campuran Portland Cement dan Gypsum Sintesis (CaSO42H2O) Ditinjau dari Nilai California Bearing Ratio (CBR). *Jurnal Teknik Sipil Dan Perencanaan*, *2*(10), 161–170. https://journal.unnes.ac.id/nju/jtsp/article/view/6958/5071

Oktaviani, W., & Halim, A. (2021). Pengaruh Pembelajaran Tematik Terpadu Tipe Webbed Berbasis Kearifan Lokal terhadap Minat Belajar Pada SDN Gudang Tigaraksa. *Jurnal Inovasi Penelitian*, *2*(3), 1005–1014. https://doi.org/10.47492/jip.v2i3.808

Pamungkas, A., Subali, B., & Linuwih, S. (2017). Implementasi Model Pembelajaran IPA berbasis Kearifan Lokal untuk Meningkatkan Kreativitas dan hasil Belajar Siswa. *Jurnal Inovasi Pendidikan IPA, 3*(2), 118-127. https://doi.org/10.21831/jipi.v3i2.14562

Pingge, H. D. (2017). Kearifan Lokal dan Penerapannya di sekolah. *Jurnal Edukasi Sumba*, *01*(02), 128–135. https://doi.org/10.53395/jes.v1i2.27

Pratama, R., & Febriani, E. A. (2024). Kendala-kendala dalam Pelaksanaan Proyek Penguatan Profil Pelajar Pancasila (P5) Tema Kearifan Lokal di SMAN 2 Kinali. *Journal of Education & Pedagogy*, *3*, 366–376. https://doi.org/10.24036/nara.v3i4.239

Romadi, & Febri, G. (2017). Pembelajaran Sejarah Lokal Berbasis Folklore untuk Menanamkan Nilai Kearifan Lokal kepada Siswa. *Sejarah Dan Budaya*, *1*(2), 79–94. http://dx.doi.org/10.17977/sb.v11i1.9123

Rummar, M. (2022). Kearifan Lokal dan Penerapannya di Sekolah. *Jurnal Syntax Transformation*, *3*(12), 2722–5356. https://doi.org/10.46799/jst.v3i12.655

Saputra, A., Wahyuni, S., & Handayani, R. D. (2016). Pengembangan Modul IPA Berbasis Kearifan Lokal Daerah Pesisir Puger pada Pokok Bahasan Sistem Transportasi di SMP. *Jurnal Pembelajaran Fisika*, *5*(2), 182–189. https://jurnal.unej.ac.id/index.php/JPF/article/view/3967

Saputri, A. N., & Desstya, A. (2023). Implementasi Pembelajaran IPA Sekolah Dasar Berbasis Kearifan Lokal di Kabupaten Sragen. *Elementary School Education Jurnal*, 1–8. https://doi.org/10.30651/else.v7i2.18280

Seftyono, C. (2014). Rawa Pening dalam Prespektif Politik Lingkungan: Sebuah Kajian Awal. *Indonesian Journal of Conservation*, *3*(1), 7–15. https://doi.org/10.15294/ijc.v3i1.3084

Soeprobowati, T. R., & Suedy, S. W. A. (2010). Status Trofik Danau Rawa Pening dan Solusi Pengelolaannya. *Jurnal Sains & Matematika (JSM)*, *18*(2005), 158–169. https://ejournal.undip.ac.id/index.php/sm/article/view/6257

Suwardi, & Rahmawati, S. (2019). Pengaruh Nilai-Nilai Kearifan Lokal Terhadap Pola Pengasuhan Anak Usia Dini (AUD). *Jurnal Al-AZHAR INDONESIA SERI HUMANIORA*, *5*(2), 87–92. http://dx.doi.org/10.36722/sh.v5i2.347

Zuliyanti. (2022). Tradisi Larung Sesaji Sebagai Upaya Pemahaman Mitigasi Bencana. *Prosiding PIBSI Ke-44*, *1*(1), 173–179. https://prosiding.pbsi.upy.ac.id/index.php/2023/article/view/46