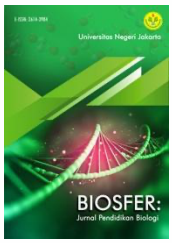
Biosfer: Jurnal Pendidikan Biologi, 18(1), 69-81 (2025)

Biosfer: Jurnal Pendidikan Biologi

Journal homepage: http://journal.unj.ac.id/unj/index.php/biosfer



Junior high school student's knowledge about local potential of Lake Rawa Pening in relation to science learning

Ika Maulida Nuryani, Susanti Pudji Hastuti, Natalia Rosa Keliat*

Biology Education, Faculty of Biology, Universitas Kristen Satya Wacana, Indonesia

*Corresponding author: natalia.keliat@uksw.edu

ARTICLE INFO

Article history
Received: 09 July 2024
Revised: 29 November 2024
Accepted: 07 December 2024

Keywords:
Rawa Pening
Local potential
Science learning

ABSTRACT

Lake Rawa Pening is one of the natural resources with abundant local potential that can be utilized in the world of education and the surrounding community. The objectives of this study are: a) to determine the local potential of Lake Rawa Pening, and b) to determine the level of knowledge of junior high school students about Lake Rawa Pening related to local potential of the Lake in relation to science learning materials. The subjects of the study were grade IX junior high school students in eight schools around Lake Rawa Pening. Interviews and tests were used fordata collection technique. Data analysis were carried out by calculating students' scores and interpreting them into the minimum completion criteria (KKM) category by the Ministry of Education and Culture. Based on the results of the study, it is known that there are twenty-four types of fish, one type of lobster, one type of shellfish, five types of birds, twenty types of plants, and two types of inanimate objects that are included in the local potential of Lake Rawa Pening. Based on the results of the study, the average value of junior high school students' knowledge about the local potential of Lake Rawa Pening in relation to science learning materials only reaches 63, which it is categorized as insufficient. It was found that students' knowledge in insufficient category is 77%, the sufficient category is 19%, the good category is 4%, and no students were found to have knowledge in the very good category.

INTRODUCTION

Natural Sciences is a teaching and learning process between students and teachers to improve students' cognitive, affective, and psychomotor abilities in the field of science (Saputra et al., 2016). Science is a learning that studies nature and all natural phenomena in the form of systematic facts, concepts, or principles (Rozi et al., 2024). Learning science cannot be done simply by memorizing or simply listening to the teacher explaining the concept (Fakhriyah et al., 2017). Learning science is not enough just by using traditional teaching methods (Kalogiannakis et al., 2021). Science learning requires students to actively discuss and find out their knowledge through observations or experiments, which can ultimately form their concept of knowledge, creativity, and scientific attitudes (Evagorou et al., 2015).

Educational goals in learning can be achieved when teachers can use a variety of learning models that are adjusted to the development and character of students and utilize the environment as a learning resource (Hattie & Donoghue, 2016), as well as integrate local potential in learning (Halil et al., 2024). In addition, teachers must be able to relate learning topics to events that occur in everyday life and integrate learning with local potential (Rahardini et al., 2017). The independent curriculum in Indonesia aims to strengthen the learning system that is directed at local development and potential with the aim of producing an adaptive generation that can face the development of the times (Halil et al., 2024). The integration of local potential makes learning more applicable and meaningful and can encourage students' understanding of local potential in their area (Wulandari & Djukri, 2021).

Etymologically, local potential consists of two words, namely "potential," meaning available resources, and the word "local," meaning a place with certain features that exist independently of anything that might happen there (Fowler, 1965). Local potential is the natural, cultural, and wealth of human resources in an area that is invaluable to a region. Endah (2020) stated that local potential is the power, ability, and capability possessed by a region to be developed to improve community welfare. Each region has different local potential and biodiversity depending on the geographical conditions, climate, and landscape of the area (Blowes et al., 2019).

Indonesia has great local potential. Central Java is one of the provinces in Indonesia that is rich in local potential. Lake Rawa Pening is one of the natural resources in Central Java Province. Lake Rawa Pening is located at coordinates $7^0$4 SL- $7^0$30' SL and 110^0 24'46" EL - $110^0$49'06" EL and is at 455–465 m above sea level (asl) (Machbub et al., 2012). Administratively, Lake Rawa Pening is flanked by four sub-districts in Semarang Regency, namely Bawen Sub-district (North), Banyubiru Sub-district (South), Tuntang Sub-district (East), and Ambarawa Sub-district (West). Figure 1 presents a photo of Lake Rawa Pening.

Based on the results of initial interviews conducted with four village officials and eight communities around Lake Rawa Pening in four sub-districts, it is known that Lake Rawa Pening has various local potentials. Unfortunately, over time, the local potential of Lake Rawa Pening has decreased. This is indicated by the decline in natural resources both in quality and quantity, such as declining water quality and declining fisheries productivity (Lois et al., 2018). The explosion of the water hyacinth population is one of the causes of the decline in the water quality of Lake Rawa Pening, which has an impact on the decline in the local potential of Lake Rawa Pening. One of the impacts is the declining of fish, including endemic fish such as wader ijo (green barb) (Aida & Utomo, 2016). The decline of water quality also affects the decline of the bird population in Lake Rawa Pening (Rifki, 2017). Therefore, efforts are needed to prevent environmental pollution and preserve the local potential of Lake Rawa Pening.

The local potential in Lake Rawa Pening can be used as a learning resource for students, especially for schools in the area around the lake, through the integration of local potential into learning materials. In the field of education, local potential can be utilized as a learning resource that supports the ongoing learning process (Hastuti et al., 2019). Integration of local potential in learning can influence students' learning interests, thereby improving learning outcomes (Bulkani et al., 2022). In addition, the integration of local potential in learning can also make students familiar with the potential of their own region, able to recognize and understand local potential in their region, understand various aspects related to local potential in the region, able to process natural resources, and can make efforts to preserve the environment (Jamiludin et al., 2021).

The integration of local potential into learning can also reduce the effects of the rapid flow of globalization on a generation that tends to forget local things (Albantani & Madkur, 2018). The use of a

learning model combined with local content can help students act locally but still with a global mindset (Wahyudin, 2015). According to Soga & Gaston (2016), by integrating local potential into learning, students can be introduced to natural resources, their utilization, and conservation efforts. Thus, education contributes to increasing human concern for nature.

As the next generation, students must know what types of potential exist in an area, know their utilization, and make conservation efforts. Therefore, according to Venables (2016), students also have the responsibility to pass on knowledge about local potential to the next generation. Integrating local potential into learning is very important so that students continue to know, use, empower, develop, and preserve existing local potential (Damopolii et al., 2019).

Local potentials around the school can be used as learning resources that can be used to develop students' abilities and increase local potential scientifically (Hastuti & Alanis, 2022). Utilization of local potential in learning can facilitate students to connect the knowledge that they acquire with everyday life (Wilujeng et al., 2020). In addition, the integration of local potential in learning can also improve students' critical thinking skills and their scientific literacy (Hastuti et al., 2022). These skills must be possessed by students in preparation for facing the challenges of life in the 21st century. This is supported by Turiman et al. (2012), who stated that students must be equipped with 4C skills (communication, collaboration, creativity, and critical thinking) as well as scientific literacy to face the challenges of life in the 21st century.

Several facts in the field show that teachers have not integrated local potential into learning (Parmin et al., 2016). This is due to constraints in time, costs, and the difficulty of determining learning materials that are relevant to local potential (Prihandono et al., 2017). In addition, according to Fuadati & Wilujeng (2019), the integration of local potential into teaching materials such as student worksheets is still very rare. This is due to the lack of the insight of teachers about local potential and limited teachers' understanding about the integrating local potentials to be teaching materials. The lack of teacher knowledge of local potential is certainly a challenge for teachers in the process of integrating local potential into learning (Autti & Bæck, 2021). The low integration of local potential into learning will certainly affect learning interest, learning outcomes, environmental care attitudes, and environmental conservation effort. Based on this background, this study aims to 1) determine the local potential of Lake Rawa Pening and 2) determine the level of knowledge of junior high school students about local potential of Lake Rawa Pening related to science learning materials. From this study, information is obtained regarding the local potential of Lake Rawa Pening and data on junior high school students' knowledge about the local potential of Lake Rawa Pening in science learning materials. The local potential in this study is limited to plants, animals, and inanimate objects. The data can be used as a reference or introduction to develop media as a source of learning about Lake Rawa Pening.

METHODS

Research Design

This type of research is quantitative descriptive research. This study was conducted in Lake Rawa Pening, Central Java, Indonesia and eight junior high schools around Lake Rawa Pening with a maximum distance of 4 km, including State Junior High School 2 Ambarawa, State Junior High School 4 Ambarawa, Lentera Christian Junior High School Ambarawa, Islamic Plus At Tohari Junior High School Tuntang, State Junior High School 1 Banyubiru, State Junior High School 2 Banyubiru, Sudirman Islamic Junior High School Banyubiru, and PGRI Junior High School Banyubiru, Indonesia. Lake Rawa Pening was chosen because it has various local potentials that can be utilized in the world of education. Test and non-test methods were used for data collection techniques in this study.

Population and Samples

The selection of respondents used the purposive sampling technique. This technique is important and needed in sociocultural research and other factors expected to influence the outcomes. Through Purposive Sampling, the samples obtained will have characteristics that are in accordance with the research objectives (Andrade, 2021). From eight junior high schools, the number of junior high school students in grade IX was 956 students, and the number of respondents/test participants was 282 students, determined using the Slovin formula and 5% error rate (Khasanah, 2017). The selection of respondents from each school is adjusted to the number of students in each school.

Figure 1. Location of Lake Rawa Pening

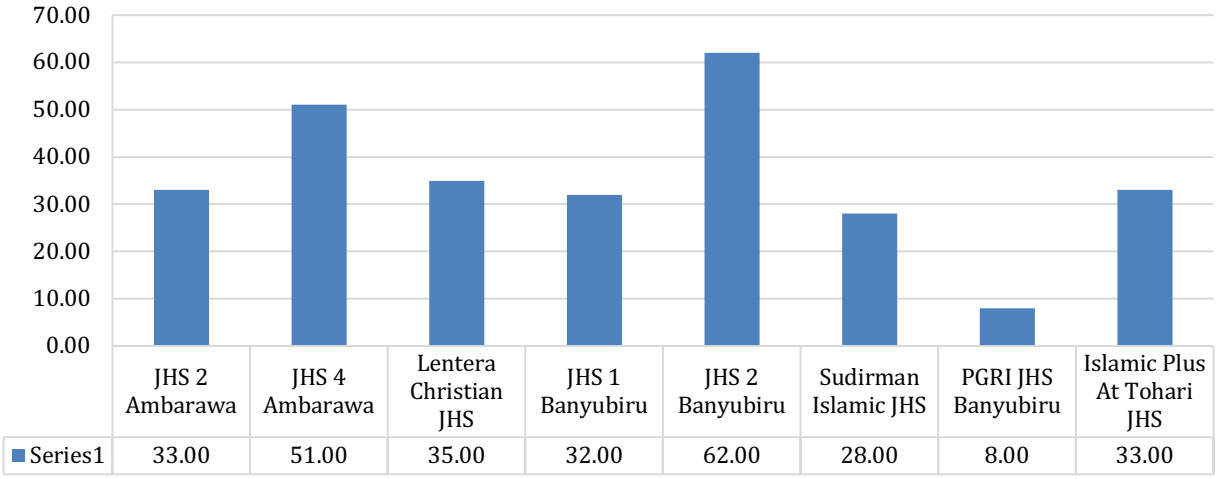


Figure 2. The number of respondents

Before the test was conducted on students, interviews were conducted with village officials and fishermen to explore the local potential of Lake Rawa Pening. Snowball sampling was used for the method of selecting respondents in the interview, in which four village officials and eight fishermen were selected from four sub-districts. In addition, interviews were also conducted with science teachers to find out how the local potential of Lake Rawa Pening is utilized in science learning.

Instrument

The instruments used in this research were tests, interviews, and documentation. The test instrument consisted of questions about students' knowledge of the local potential of Lake Rawa Pening. The test consisted of multiple choice questions totaling 35 questions. The test instrument was prepared based on science learning achievements which were also adjusted to the interview results regarding the local potential of Lake Rawa Pening. Cognitive questions consist of six aspects include cognitive, understanding, application, analysis, evaluation and creation. The test instrument was validated by subject matter experts and language experts. The validation results showed that the test instrument was suitable for use. The test was conducted to respondents, namely ninth grade junior high school students around Lake Rawa Pening. Meanwhile, interviews were conducted with the community and junior high school science teachers around Lake Rawa Pening using an interview sheet guide to find out the local potential of Lake Rawa Pening and the process of integrating local potential in science learning. Documentation was conducted to obtain evidence or records of events that have occurred during the research. Documentation is in the form of photos of interview implementation, photos of the local potential of Lake Rawa Pening, and interview recordings.

Procedure

In conducting this research, several stages must be carried out. Figure 3 presents the steps of this research procedure.

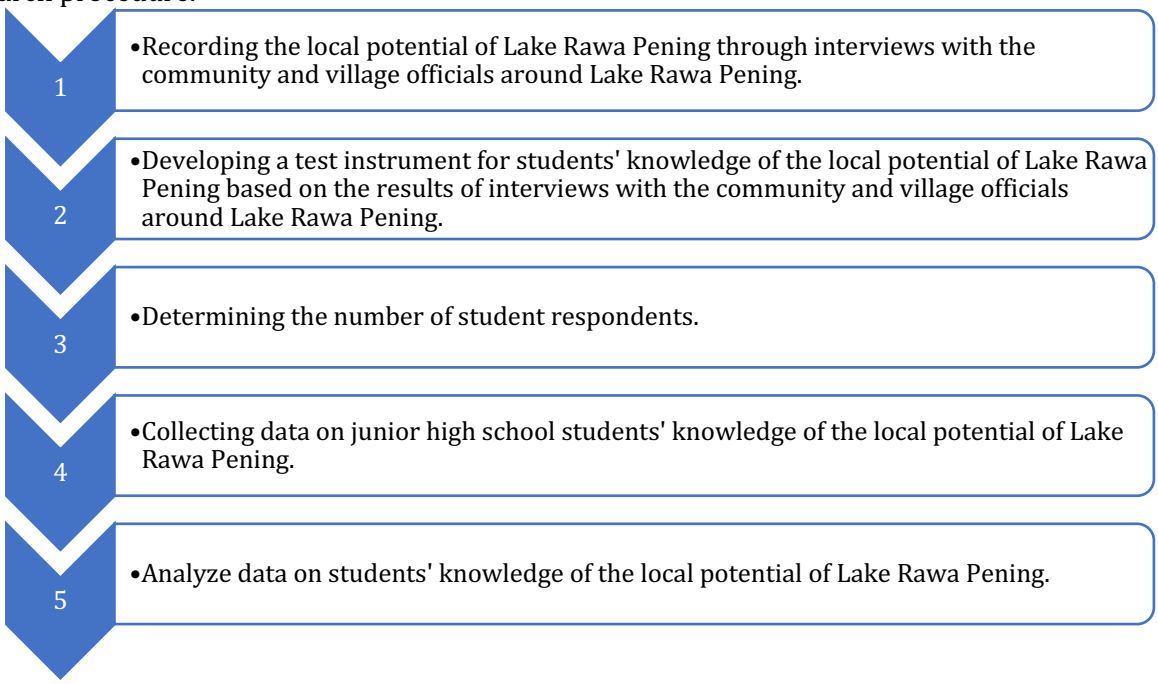


Figure 3. Research Procedures

Based on the procedure in Figure 3, it can be explained that this research starts from recording the local potential of Lake Rawa Pening through interviews with the community and village officials around Lake Rawa Pening. The local potential interview data that had been obtained was then used to develop a test instrument for students' knowledge of the local potential of Lake Rawa Pening. After the test instrument was developed, the instrument was first validated by material experts. The next step was to determine the number of student respondents using the Slovin formula with an error rate of 5%. Data collection on junior high school students' knowledge of the local potential of Lake Rawa Pening was carried out by giving a test. After the test results of students' knowledge of the local potential of Lake Rawa Pening were obtained, then the data were analyzed.

Data Analysis Techniques

The data was analyzed by calculating students' scores and then interpreting them into categories – very good (93-100), good (84-92), moderate (75-83), and poor (<75) (Kemendikbud, 2017).

RESULTS AND DISCUSSION

Based on interviews with four village officials and eight fishermen, data on the local potential of Lake Rawa Pening was obtained, as stated in Table 1.

Table 1
Local Potential Data for Lake Rawa Pening

No	Name	No	Name
1	Wader ijo fish (*Osteochilus vittatus*)	31	Berkik birds (*Gallinago megala*)
2	Wader pari fish (*Rasbora argyrotaenia*)	32	Eceng gondok (*Eichhornia crassipes*)
3	Betok fish (*Anabas testudineus*)	33	Genjer (*Limnocharis flava*)
4	Gabus fish (Kutuk fish) (*Channa striata*)	34	Keladi (*Alocasia macrorrhizos*)
5	Kepala batu fish (*Atherinomorus lacunosus*)	35	Semanggi air (*Marsilea crenata*)
6	Betutu fish (*Oxyeleotris marmorata*)	36	Keladi tikus (*Typhonium flagelliforme*)
7	Sepat siam fish (*Trichopodus pectoralis*)	37	Rumput simpul gunung (*Aeschynomene indica*)
8	Tawes fish (*Barbonymus gonionotus*)	38	Teratai (*Nymphaea*)
9	Mas fish (Karper fish) (*Cyprinus carpio*)	39	Tetepok (*Nymphoides indica*)
10	Belida fish (*Chitala lopis*)	40	Krangkong (*Ludwigia adscendens*)

No	Name	No	Name
11	Koan fish (*Ctenopharyngodon idella*)	41	Prumpung (*Phragmites karka*)
12	Nila fish (*Oreochromis niloticus*)	42	(*Ludwigia* sp.)
13	Mujair fish (*Oreochromis mossambicus*)	43	Kolonjono (*Urochloa mutica*)
14	Red devil fish (*Amphilophus labiatus*)	44	Rumput teki (*Cyperus rotundus*)
15	Toman fish (*Channa micropeltes*)	45	(*Ammannia* sp.)
16	Sapu-sapu fish (*Hypostomus plecostomus*)	46	Rumput bebek (*Echinochloa* sp.)
17	Bawal fish (*Colossoma macropomum*)	47	(*Hemarthria altissima*)
18	Kepala timah fish (*Aplocheilus panchax*)	48	Urang-aring (*Eclipta prostrate* L.)
19	Tambakan fish (*Helostoma temmincki*)	49	(*Ludwigia repens*)
20	Seribu fish (*Poecilia reticulatus*)	50	Pacar air (*Impatiens* sp.)
21	Sili fish (*Microphis brachyurus*)	51	Putri malu (*Mimosa pudica*)
22	Lele gunung fish (*Glyptosterum platypogon*)	52	Kangkung (*Ipomea aquatica*)
23	Lele fish (*Clarias batrachus*)	53	Daun asam kecil (*Oxalis* sp.)
24	Lobster air tawar (*Cherax quadricarinatus*)	54	(*Ludwigia leptocarpa*)
25	Kerang kijing (*Anodonta woodiana*)	55	Rumput lampuyangan (*Panicum repens*)
26	Belut (*Monopterus albus*)	56	Cacabean (*Ludwigia peruviana*)
27	Bangau bluwok birds (*Mycteria cinerea*)	57	(*Cyperus haspan*)
28	Belibis birds (*Dendrocygna javanica*)	58	Peat
29	Peruk birds (*Gallinula chloropus*)	59	Water
30	Kuntul birds (*Ardea alba*)		

Based on the results of interviews with fishermen, it is known that Lake Rawa Pening has abundant natural resources that can be utilized by the surrounding communities. Some of the natural resources are various types of fish, shellfish, shrimps, lobsters, water hyacinths, water spinach, peat soil, water for rice field irrigation, and lake land that is used as a rice field area when the water volume decreases. This is also supported by the results of interviews with village officials around Lake Rawa Pening, who stated that many people around work as fishermen and farmers. The local potential in Lake Rawa Pening can improve the welfare of the surrounding community, so it is important to maintain the ecosystem of Lake Rawa Pening so that it is not polluted and remains stable.

Based on the results of research on the local potential of Lake Rawa Pening listed in Table 1, Lake Rawa Pening has various local potentials including twenty-four types of fish, one type of lobster, one type of shellfish, five types of birds, twenty-six types of plants, and two types of inanimate objects that are included in the local potential of Lake Rawa Pening.

Utilization of local potential in learning is one of the characteristics that are expected to emerge according to the curriculum so that learning becomes more applicable and meaningful and can answer the demands of 21st-century learning (Rahman & Dewi, 2024). Utilization of local potential in learning can increase students' interest in learning and learning outcomes (Wulandari et al., 2019). Learning based on local potential can also improve science process skills, environmental awareness, and conceptual understanding (Ivana et al., 2021). Science process skills are important for students to have because they are related to the ability to understand and solve complex problems in the real world (Maison et al., 2019).

Based on the test results on students' knowledge of the local potential of Lake Rawa Pening, the average score was only 63 with a less category. The description of junior high school students' knowledge about the local potential of Lake Rawa Pening is presented in Figure 4. Based on the results of the analysis, it is known that 77% of students in junior high schools around Lake Rawa Pening have knowledge about the local potential of Lake Rawa Pening with a less category, a sufficient category reaching 19% of students, a good category reaching 4% of students, and no students were found with a very good category. This is also in accordance with research of Setiawan et al. (2017), that students' knowledge of local potential is still low. Some factors causing the lack of students' knowledge about the local potential of Lake Rawa Pening are the lack of utilization of local potential as a learning resource and the lack of learning media about the local potential of Lake Rawa Pening. This is in accordance with the research results Safitri et al. (2018), which state that science learning that integrates local potential is still very rare. Based on the results of interviews with teachers, it is known that the factors causing the lack of utilization of local potential in learning include limited time and the lack of teachers' skills in utilizing local potential in learning. This is supported by Wilujeng et al. (2017), which stated that several factors that cause the lack of utilization of local potential in learning include limited time, the lack of an appropriate model, limited costs, limited facilities, and learning resources used by students have not

been linked to local potential. The lack of integration of local potential in learning is one of the causes of low student learning achievement that causes students to be unfamiliar with the local potential in their area (Sobiatin et al., 2020).

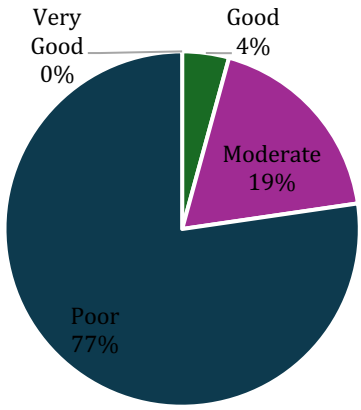


Figure 4. Percentage diagram of junior high school students' knowledge about the local potential of Lake Rawa Pening

The level of student's knowledge is based on Bloom's taxonomy, which is divided into six levels, namely C1 (knowledge), C2 (understanding), C3 (application), C4 (analysis), C5 (synthesis), and C6 (evaluation) (Prasad, 2021). In this 21st century, learning is directed at developing HOTS (Higher Order Thinking Skill) (Sepriyanti et al., 2022). HOTS (Higher Order Thinking Skill) includes analysis, synthesis, and evaluation skills (Anggraini et al., 2019). The high-level thinking skills of Indonesian students are still relatively low (Pahdi et al., 2020). Students' low high-level thinking skills occur because students tend to be accustomed to learning and giving LOTS (Low Order Thinking Skill) type questions (Walid et al., 2019). The use of everyday life experiences in learning materials and giving questions can foster low HOTS (Higher Order Thinking Skill) students (Haryanto & Arty, 2019). In addition, the use of local potential in learning can help develop high-level thinking skills in students because students are encouraged to be able to connect the knowledge they already have and apply it in everyday life (Agustinasari et al., 2021).

Figure 5 presents a diagram of students' cognitive learning outcomes about the local potential of Lake Rawa Pening at the low cognitive test question level (C1 – C2). Figure 5 shows that students' knowledge about the local potential of Lake Rawa Pening, which 59% of students are in insufficient category, 29% of students are in sufficient category, 7% of students are in good category, and 5% of students are in excellent category.

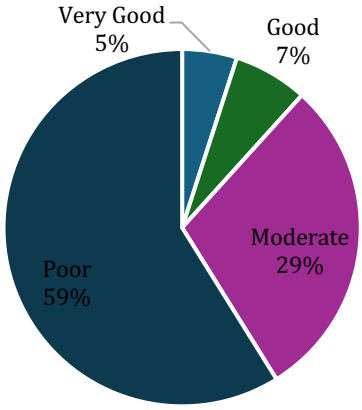


Figure 5. Percentage of low cognitive level of junior high school students' cognitive learning outcomes related to the local potential of Lake Rawa Pening.

Figure 6 presents a diagram of students' medium cognitive level (C3 – C4) outcomes about the local potential of Lake Rawa Pening. In Figure 6, based on students' answers at the medium cognitive question level, it is known that students' knowledge about the local potential of Lake Rawa Pening, 80%

of students are in insufficient category,17% of students are in sufficient category, 2% of students are in good category, and 1% of students are in excellent category.

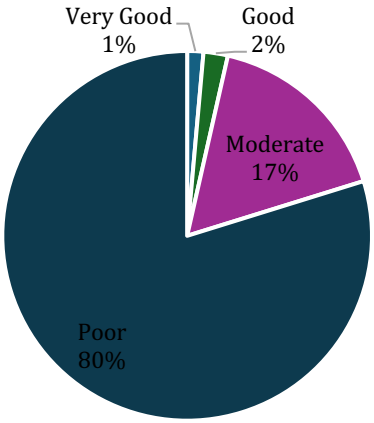


Figure 6. Percentage the intermediate cognitive level of junior high school students' cognitive learning outcomes about the local potential of Lake Rawa Pening

Figure 7 presents a diagram of students' cognitive learning outcomes about the local potential of Lake Rawa Pening at the high cognitive level (C5 – C6). Figure 7 shows that 82% of students are in poor category, and only 18% of students are in excellent category related to the knowledge about the local potential of Lake Rawa Pening.

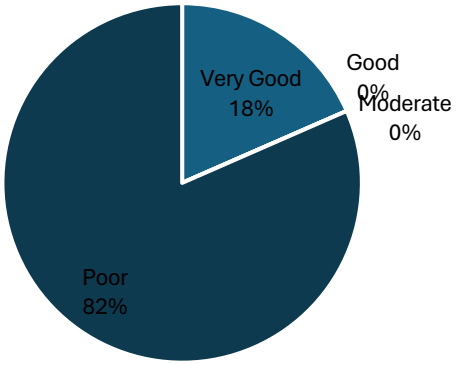


Figure 7. Percentage the diagram of junior high school students' high cognitive level of learning outcomes about the local potential of Lake Rawa Pening

The lack of utilization of local potential in learning is certainly very detrimental considering many benefits for students, such as helping them to master material concepts, increasing understanding of nature, improving their skills, and fostering a sense of responsibility to preserve the environment and culture in their area (Lestari & Rosana, 2020). Another benefit that is obtained is being able to motivate students to learn and develop their skills according to local potential (Usmeldi & Amini, 2020). If the learning carried out has been linked to local potential, students will be able to apply their knowledge to maximize or utilize local potential in their area effectively and efficiently (Alfiana et al., 2022). The utilization of local potential in learning must be adjusted to learning achievements so that each different local potential cannot necessarily be utilized in the same material. The local potential of Lake Rawa Pening is suitable for integration into science learning on the material on the diversity of living things, classification of living things, characteristics of living things, lifestyles of living things, food chains, the relationship between the structure of organs of living things and their functions, causes of environmental pollution, and utilization of natural resources for human life.

One form of utilizing local potential is to develop learning media based on local potential adjusted to the needs and characteristics of students (Nisa & Wilujeng, 2021). Teachers are expected to be able to develop learning media based on local potential to help students understand concepts correctly and

apply them in everyday life (Setiawan et al., 2017). Besides, the level of students' knowledge about local potential will also affect their attitude toward caring for the environment (Liu et al., 2020). Science learning that is linked to everyday life will be more meaningful and firmly embedded in memory and can be implemented by students in various aspects of life (Purwati et al., 2018).

The local potential of Lake Rawa Pening can be utilized in the world of education by integrating it into science learning. This is supported by Daniati et al. (2019), who stated that nature provides various abundant natural resources that can be used as alternative learning resources. The use of teaching materials that are in direct contact with students' daily lives will make it easier for students to understand concepts and increase their motivation. In addition, because learning is directly related to the surrounding environment, it can foster students' awareness and sense of responsibility to protect and preserve the environment.

Learning media based on the local potential of Lake Rawa Pening needs to be developed considering the lack of student knowledge of the local potential of the Lake and the unoptimal utilization of the local potential of Lake Rawa Pening as a science learning medium. Generally, teachers only use textbooks as the main reference for learning, but the learning textbooks used are less appropriate or not related to the conditions of students' daily life and the surrounding environment (Jayanti et al., 2017). The lack of development of learning media based on local potential causes learning in each region in Indonesia to not have its characteristics and causes students to lack understanding of the local potential around them (Nurhidayati et al., 2022). The lack of utilization of local potential as a learning medium is caused by the limited understanding and skills of teachers in creating and developing creative and innovative teaching materials by exploring local potential (Zuriah et al., 2016).

CONCLUSION

Lake Rawa Pening has various local potentials from various types of animals, plants, and inanimate objects. Based on the results of the study, it is known that there are twenty-four types of fish, one type of lobster, one type of shellfish, five types of birds, twenty-six types of plants, and two types of inanimate objects that are included in the local potential of Rawa Pening Lake. The local potential of Lake Rawa Pening can be utilized in the world of education as a source of learning and utilized by the surrounding community to improve welfare. Based on the study of measuring junior high school students' knowledge about the local potential of Lake Rawa Pening in relation to science learning materials, it is known that the average knowledge of junior high school students about the local potential of Lake Rawa Pening to science learning materials is still in the low category, with an average value of only 63. It was found that knowledge about the local potential of Lake Rawa Pening in insufficient category was 77% of students, the sufficient category was 19% of students, the good category was 4% of students, and no students were found to know the excellent category.

REFERENCES

Agustinasari, A., Susilawati, E., Yulianci, S., Fiqry, R., & Gunawan, G. (2021). The Implementation of Inquiry by Using Local Potential to Improve Critical Thinking Skills in Bima. *Journal of Physics: Conference Series*, *1933*(1), 1–6. https://doi.org/10.1088/1742-6596/1933/1/012078

Aida, S. N., & Utomo, A. D. (2016). Kajian Kualitas Perairan untuk Perikanan di Rawa Pening Jawa Tengah. *BAWAL Widya Riset Perikanan Tangkap*, *8*(3), 173–182. https://doi.org/10.15578/bawal.8.3.2016.173-182

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), 1–8. https://doi.org/10.7575/aiac.ijalel.v.7n.2p.1

Alfiana, F., Bachtiar, I., & Handayani, B. S. (2022). Pembelajaran Biologi Cacing Nyale Melalui Pendekatan Saintifik untuk Meningkatkan Kemampuan Berpikir Kritis Siswa SMA. *Jurnal Ilmiah Profesi Pendidikan*, *7*(2b), 605–610. https://doi.org/10.29303/jipp.v7i2b.579

Andrade, C. (2021). The Inconvenient Truth About Convenience and Purposive Samples. *Indian Journal of Psychological Medicine*, *43*(1), 86–88. https://doi.org/10.1177/0253717620977000

Anggraini, N. P., Budiyono, & Pratiwi, H. (2019). Analysis of Higher Order Thinking Skills Students at Junior High School in Surakarta. *Journal of Physics: Conference Series*, *1211*(1), 1–9. https://doi.org/10.1088/1742-6596/1211/1/012077

Autti, O., & Bæck, U. D. K. (2021). Rural Teachers and Local Curricula. Teaching Should not be a Bubble

Disconnected from the Community. *Scandinavian Journal of Educational Research*, *65*(1), 71–86. https://doi.org/10.1080/00313831.2019.1659399
Blowes, S. A., Supp, S. R., Antão, L. H., Bates, A., Bruelheide, H., Chase, J. M., Moyes, F., Magurran, A., McGill, B., Myers-Smith, I. H., Winter, M., Bjorkman, A. D., Bowler, D. E., Byrnes, J. E. K., Gonzalez, A., Hines, J., Isbell, F., Jones, H. P., Navarro, L. M., … Dornelas, M. (2019). The Geography of Biodiversity Change in Marine and Terrestrial Assemblages. *Science*, *366*(6463), 339–345. https://doi.org/10.1126/science.aaw1620
Bulkani, Fatchurahman, M., Adella, H., & Andi Setiawan, M. (2022). Development of Animation Learning Media Based on Local Wisdom to Improve Student Learning Outcomes in Elementary Schools. *International Journal of Instruction*, *15*(1), 55–72. https://doi.org/https://doi.org/10.29333/iji.2022.1514a
Damopolii, I., Nunaki, J. H., Nusantari, E., & Kandowangko, N. Y. (2019). Integrating Local Resources into Inquiry-Based Teaching Materials to Training Students' Science Process Skills. *AIP Conference Proceedings*, *2120*, 1–6. https://pubs.aip.org/aip/acp/article-pdf/doi/10.1063/1.5115703/14191025/060003_1_online.pdf
Daniati, S. P., Subiyantoro, S., & Fadhilah, S. S. (2019). Natural School Culture as a Free and Fun Alternative Education in Building the Students' Character. *Elementary Education Online*, *18*(1), 331–342. https://doi.org/10.17051/ilkonline.2019.527617
Devitasari, P. I., Wilujeng, I., Azhary, S. A., & Sadewo, M. A. I. (2021). The Development of Natural Science Module Web Integrated with Local Plants Toward Cooperation Skills and Environmental Care Attitude of Students. *Journal of Physics: Conference Series*, *1882*(1), 1–7. https://doi.org/10.1088/1742-6596/1882/1/012094
Endah, K. (2020). Pemberdayaan Masyarakat : Menggali Potensi Lokal Desa. *Moderat: Jurnal Ilmiah Ilmu Pemerintahan*, *6*(1), 135–143. https://doi.org/http://dx.doi.org/10.25157/moderat.v6i1.3319
Evagorou, M., Erduran, S., & Mäntylä, T. (2015). The Role of Visual Representations in Scientific Practices: from Conceptual Understanding and Knowledge Generation to 'seeing' How Science Works. *International Journal of STEM Education*, *2*(11), 1–13. https://doi.org/10.1186/s40594-015-0024-x
Fakhriyah, F., Masfuah, S., Roysa, M., Rusilowati, A., & Rahayu, E. S. (2017). Student's Science Literacy in the Aspect of Content Science? *Jurnal Pendidikan IPA Indonesia*, *6*(1), 81–87. https://doi.org/10.15294/jpii.v6i1.7245
Fowler, H. W. (1965). *A Dictionary of Modern English Usage*. New York: Oxford University Press. https://doi.org/10.2307/452900
Fuadati, M., & Wilujeng, I. (2019). Web-Lembar Kerja Peserta Didik IPA Terintegrasi Potensi Lokal Pabrik Gula untuk Meningkatkan Rasa Ingin Tahu Peserta Didik. *Jurnal Inovasi Pendidikan IPA*, *5*(1), 98–108. https://doi.org/10.21831/jipi.v5i1.24543
Halil, N. I., Arafah, B., Saputra, I. G. P. E., Hasyim, R. S., Sarmadan, Takwa, & Karma, R. (2024). Preservation of Tolaki Mekongga Language Through Merdeka Curriculum-Based Local Subject Teaching Modules. *Journal of Language Teaching and Research*, *15*(3), 960–971. https://doi.org/10.17507/jltr.1503.30
Haryanto, P. C., & Arty, I. S. (2019). The Application of Contextual Teaching and Learning in Natural Science to Improve Student's HOTS and Self-Efficacy. *Journal of Physics: Conference Series*, *1233*(1), 1–8. https://doi.org/10.1088/1742-6596/1233/1/012106
Hastuti, P. W., & Alanis, M. A. (2022). The Effect of a Contextual Approach Containing the Local Potential "Getuk" on Critical Thinking Skills. *AIP Conference Proceedings*, *2600*, 1–7. https://doi.org/10.1063/5.0115344
Hastuti, P. W., Setianingsih, W., & Widodo, E. (2019). Integrating Inquiry Based Learning and Ethnoscience to Enhance Students' Scientific Skills and Science Literacy. *Journal of Physics: Conference Series*, *1387*(1), 1–6. https://doi.org/10.1088/1742-6596/1387/1/012059
Hastuti, P. W., Wilujeng, I., Susilowati, & Nurmadhani, T. (2022). Integration Local Potential "Ketingan Tourism Village" in Science Learning to Improve Critical Thinking and Scientific Literacy Based on The Nature of Science Framework. *AIP Conference Proceedings*, *2600*, 1–7. https://doi.org/10.1063/5.0115347
Hattie, J. A. C., & Donoghue, G. M. (2016). Learning Strategies: A Synthesis and Conceptual Model. *Npj Science of Learning*, *1*(1), 1–13. https://doi.org/10.1038/npjscilearn.2016.13

Ivana, A., Sriyati, S., & Priyandoko, D. (2021). Dadiah Local Potential-Based Biology Learning Resources to Improve Students' Science Process Skills. *Journal of Physics: Conference Series*, *1806*(1), 1–6. https://doi.org/10.1088/1742-6596/1806/1/012164

Jamiludin, Abubakar, S. R., Darnawati, Salim, & Uke, W. A. S. (2021). Integration of Local Wisdom Coastal Communities in Early Childhood Education Learning. *Elementary Education Online*, *20*(1), 922–929. https://doi.org/10.17051/ilkonline.2021.01.88

Jayanti, U. N. A. D., Susilo, H., & Suarsini, E. (2017). Analisis Kebutuhan Bentuk Sumber Belajar dan Media Pembelajaran Biologi Berbasis Potensi Lokal untuk Kelas X SMA di Provinsi Lampung. *Prosiding Seminar Pendidikan IPA Pascasarjana UM*, *2*, 591–599. http://pasca.um.ac.id/conferences/index.php/ipa2017/article/view/1122

Kalogiannakis, M., Papadakis, S., & Zourmpakis, A. I. (2021). Gamification in Science Sducation. A Systematic Review of the Literature. *Education Sciences*, *11*(22), 1–36. https://doi.org/10.3390/educsci11010022

Kemendikbud. (2017). *Panduan Penilaian oleh Pendidik dan Satuan Pendidikan* (4th ed.). Jakarta: Kemendikbud. https://repositori.kemdikbud.go.id/

Khasanah, A. (2017). *Analisis Faktor Penyebab Kesulitan Belajar Siswa pada Mata Pelajaran Ilmu Gizi di Smk Negeri 3 Purworejo* [Universitas Negeri Yogyakarta]. https://eprints.uny.ac.id/51059/

Lestari, W. Y., & Rosana, D. (2020). Analysis of Junior High School Students' Data Literacy in Ciamis with Local Potential Kampung Adat Kuta. *Journal of Physics: Conference Series*, *1440*(1). https://doi.org/10.1088/1742-6596/1440/1/012097

Liu, P., Teng, M., & Han, C. (2020). How does Environmental Knowledge Translate into Pro-Environmental Behaviors?: The Mediating Role of Environmental Attitudes and Behavioral Intentions. *Science of the Total Environment*, *728*(138126), 1–14. https://doi.org/10.1016/j.scitotenv.2020.138126

Lois, Suparno, & Handayanu, K. N. (2018). Penerapan Ekologi dalam Perancangan Pusat Konservasi Rawa Pening di Kabupaten Semarang. *Senthong*, *1*(2), 213–222. https://jurnal.ft.uns.ac.id/index.php/senthong/article/view/758

Machbub, B., Suwanto, A., Harahap, T. N., Manurung, H., Retnowati, I., Rachmiati, S., & Rustadi, W. C. (2012). Daya Tampung Beban Pencemaran Air dan Zonasi Danau Rawa Pening. In *Kementerian Lingkungan Hidup*. Jakarta: Kementerian Lingkungan Hidup. https://newberkeley.wordpress.com/wp-content/uploads/2017/03/daya-tampung-beban-pencemaran-rawa-pening.pdf

Maison, Darmaji, Astalini, Kurniawan, D. A., & Indrawati, P. S. (2019). Science Process Skills and Motivation. *Humanities and Social Sciences Reviews*, *7*(5), 48–56. https://doi.org/10.18510/hssr.2019.756

Nisa, W. M., & Wilujeng, I. (2021). Development of Integrated Science Textbooks on Local Potential Food Bakpia for Junior High School. *Journal of Physics: Conference Series*, *1806*(1), 1–6. https://doi.org/10.1088/1742-6596/1806/1/012126

Nurhidayati, S., Susantini, E., Safnowandi, Rachmadiarti, F., Khaeruman, & Sukri, A. (2022). Development of Local Potential-Based Environmental Care Instrument and its Ability to Reveal Students' Caring Attitudes at Genders and Grades. *International Journal of Instruction*, *15*(4), 613–628. https://doi.org/10.29333/iji.2022.15433a

Pahdi, R., Mailizar, & Abidin, Z. (2020). Indonesian Junior High School Students' Higher Order Thinking Skills in Solving Mathematics Problems. *Journal of Physics: Conference Series*, *1460*(1), 1–8. https://doi.org/10.1088/1742-6596/1460/1/012031

Parmin, Sajidan, Ashadi, Sutikno, & Maretta, Y. (2016). Preparing Prospective Teachers in Integrating Science and Local Wisdom through Practicing Open Inquiry. *Journal of Turkish Science Education*, *13*(2), 3–14. https://doi.org/10.12973/tused.10163a

Prasad, G. N. R. (2021). Evaluating Student Performance based on Bloom's Taxonomy Levels. *Journal of Physics: Conference Series*, *1797*(1), 1–10. https://doi.org/10.1088/1742-6596/1797/1/012063

Prihandono, T., Wahyuni, S., & Pamungkas, Z. S. (2017). Development of Module Based on Local Potential Integrated SETS in Junior High School. *The International Journal of Social Sciences and Humanities Invention*, *4*(9), 3939–3944. https://doi.org/10.18535/ijsshi/v4i9.07

Purwati, N., Zubaidah, S., Corebima, A. D., & Mahanal, S. (2018). Increasing Islamic Junior High School

Students Learning Outcomes through Integration of Science Learning and Islamic Values. *International Journal of Instruction*, *11*(4), 841–854. https://doi.org/10.12973/iji.2018.11453a
Rahardini, R. R. B., Suryadarma, I. G. P., & Wilujeng, I. (2017). The Effect of Science Learning Integrated with Local Potential to Improve Science Process Skills. *AIP Conference Proceedings*, *1868*, 1–6. https://doi.org/10.1063/1.4995192
Rahman, A., & Dewi, L. (2024). The Effectiveness of the Indonesian Education Curriculum in Enhancing Middle School Students' Literacy and Numeracy Skills. *Educational Administration: Theory and Practice*, *30*(5), 11901–11906. https://doi.org/10.53555/kuey.v30i5.5047
Rifki, M. (2017). Ladang Berpindah dan Model Pengembangan Pangan Indonesia. *Seminar Nasional Inovasi Dan Aplikasi Teknologi 2017*. https://ejournal.itn.ac.id/index.php/seniati/article/download/1940/1668
Rozi, Z. F., Yanti, F. A., Krisnawati, Y., & Komariyah, S. (2024). Local Potential as Sources of Science Learning and Integration in Sets-Based Learning (Science, Environment, Technology, Society). *Proceedings of the Online Conference of Education Research International (OCERI 2023)*, *1*(1), 733–739. https://doi.org/10.2991/978-2-38476-108-1_72
Safitri, A. N., Subiki, & Wahyuni, S. (2018). Pengembangan Modul IPA Berbasis Kearifan Lokal Kopi pada Pokok Bahasan Usaha dan Energi di SMP. *Jurnal Pembelajaran Fisika*, *7*(1), 22–29. https://doi.org/10.19184/jpf.v7i1.7227
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
Sepriyanti, N., Nelwati, S., Kustati, M., & Afriadi, J. (2022). The Effect of 21St-Century Learning on Higher-Order Thinking Skills (HOTS) and Numerical Literacy of Science Students in Indonesia Based on Gender. *Jurnal Pendidikan IPA Indonesia*, *11*(2), 314–321. https://doi.org/10.15294/jpii.v11i2.36384
Setiawan, B., Innatesari, D. K., Sabtiawan, W. B., & Sudarmin, S. (2017). The Development of Local Wisdom-Based Natural Science Module to Improve Science Literation of Students. *Jurnal Pendidikan IPA Indonesia*, *6*(1), 49–54. https://doi.org/10.15294/jpii.v6i1.9595
Sobiatin, E., Tibrani, M., Aznam, N., Saputra, A. T., & Fatharani, M. (2020). The Integration of Palembang's Local Potential in Natural Science Learning Materials. *Journal of Physics: Conference Series*, *1440*(1). https://doi.org/10.1088/1742-6596/1440/1/012106
Soga, M., & Gaston, K. J. (2016). Extinction of Experience: The Loss of Human-Nature Interactions. *Frontiers in Ecology and the Environment*, *14*(2), 94–101. https://doi.org/10.1002/fee.1225
Turiman, P., Omar, J., Daud, A. M., & Osman, K. (2012). Fostering the 21st Century Skills through Scientific Literacy and Science Process Skills. *Procedia - Social and Behavioral Sciences*, *59*(1), 110–116. https://doi.org/10.1016/j.sbspro.2012.09.253
Usmeldi, & Amini, R. (2020). The Effect of Integrated Science Learning Based on Local Wisdom to Increase the Students Competency. *Journal of Physics: Conference Series*, *1470*(1), 1–7. https://doi.org/10.1088/1742-6596/1470/1/012028
Venables, A. J. (2016). Using Natural Resources for Development: Why Has it Proven So Difficult? *Journal of Economic Perspectives*, *30*(1), 161–184. https://doi.org/10.1257/jep.30.1.161
Wahyudin, U. (2015). The Quality of a "Local Values Based" Fuctional Literacy Program: Its Contribution to the Improvement of the Learner's Basic Competencies. *International Education Studies*, *8*(2), 121–127. https://doi.org/10.5539/ies.v8n2p121
Walid, A., Sajidan, S., Ramli, M., & Kusumah, R. G. T. (2019). Construction of The Assessment Concept to Measure Students' High Order Thinking Skills. *Journal for the Education of Gifted Young Scientists, 7*(2), 237–251. https://doi.org/10.17478/jegys.528180
Wilujeng, I., Kun, Z., & Suryadarma, I. G. P. (2017). Science Learning Based on Local Potential: Overview of The Nature of Science (NoS) Achieved. *AIP Conference Proceedings*, *1868*, 1–7. https://doi.org/10.1063/1.4995189
Wilujeng, I., Suryadarma, I. G. P., Ertika, & Dwandaru, W. S. B. (2020). Local Potential Integrated Science Video to Improve SPS and Concept Mastery. *International Journal of Instruction*, *13*(4), 197–214. https://doi.org/10.29333/iji.2020.13413a
Wulandari, E., & Djukri, D. (2021). Identification of Lampung Local Potential as Source of Biology Learning in Senior High School. *Biosfer*, *14*(2), 250–263.

https://doi.org/10.21009/biosferjpb.20178
Wulandari, S., Suwondo, S., & Haryanto, R. (2019). Implementation of Environmental Education Based Local Potential to Increase Environmental Knowledge Student. *Journal of Physics: Conference Series*, *1351*(1), 1–7. https://doi.org/10.1088/1742-6596/1351/1/012054
Zuriah, N., Sunaryo, H., & Yusuf, N. (2016). IbM Guru dalam Pengembangan Bahan Ajar Kreatif Inovatif Berbasis Potensi Lokal. *Dedikasi*, *13*(1), 39–49. https://doi.org/10.22219/dedikasi.v13i0.3136