

The Local Potential of "Kembang Island": A Contextual Study in Science Learning

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Abstract. Each region of Indonesia has a distinct characteristic that distinguishes it from the others. This distinctiveness has the potential to improve a region's economy. A region's local potential can be introduced through education by integrating local potential into learning, including science learning. In accordance with this, this study was conducted to analyze the concept of science based on the local potential of Kembang Island, to determine how to integrate the local potential of "Kembang Island" into science learning, and to determine the outcomes of the implementation of learning using local potential. The qualitative-descriptive study method was used. The instruments utilized for research were observation sheets and response questionnaires. The results indicate that Kembang Island's ecosystem material contains three scientific concepts: pollution, earth layers, and disasters. The fundamental competencies in the three materials are integrated into a webbed model with the theme "My Environment at Kembang Island Nature Park." The integration of local potential in learning took the form of lesson plans, student worksheets, handouts, and assessment instruments.

Keywords: Local Potential, Kembang Island, Science Learning

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INTRODUCTION

A nation must have access to qualified human resources. The objective of the Indonesian government is to improve human resources in order to prepare future generations for quality employment. Designing learning based on a scientific approach to the processes of observing, experimenting, reasoning, creating, and communicating supports the attainment of national education objectives (Anggraena et al., 2021). This methodology is utilized throughout the entire learning process, including science learning.

The integrated webbed model focuses on a theme in order to integrate a topic. A determined theme of fascination

can attract the attention of students. However, in this situation, the teacher must be able to control the number of activities conducted and must be balanced in terms of concept development (Fogarty & Pete, 2009). The webbed model presents concepts through themes determined by interconnecting various academic disciplines. The concepts utilized in the webbed model originated from everyday phenomena. This enables the teaching and learning process to incorporate multiple activities for students. Meaningful learning encourages students to comprehend concepts as a whole and acquire a variety of skills (Anderson et al., 2001). The acquired skills assist

students in solving daily problems. With this in mind, teachers must be able to connect subject-specific instructional materials to the surrounding environment and vice versa (Puspita et al., 2020). Studies in this area demonstrate that integrated science learning utilizing integrated models facilitates an effective learning process and produces beneficial educational results (Himawati & Hidayat, 2013; Ningsih et al., 2013).

Contextual learning refers to the utilization of environmental phenomena in the educational process. Contextual learning encourages students to think realistically and enriches their learning (Habellia & Suyanto, 2021). According to Masihu and Augustyn (2021), one of the purposes of context-based learning is to investigate the various potentials of the surrounding environment. Local potential is a resource that enhances the value of the local area (Weldi, 2020). According to the research of Ningsih et al. (2013), integrated science education is conducted at the level of elementary school, involving aspects of daily life that are better packaged using particular themes. Themes derived from a region's educational potential are a means of promoting and preserving it (Danial et al., 2019). The Indonesian government has regulated the integration of local potential into its education policy system. Teachers are able to incorporate regional potential. In reality, however, teachers have not maximized the opportunities afforded them because they are unaware of how to integrate local potential into learning (Nurhidayati & Khaeruman, 2021).

South Kalimantan is one of a number of regions with local potential. South Kalimantan has 1,194,471 hectares of wetland, or 32.39 percent of its total land area. This total area, however, does not include offshore wetland areas, which may be larger than the data presented (Gumbrecht et al., 2017). Wetlands-dominated regions play a crucial role in

contemporary environmental issues. Wetlands that support diverse ecosystems are one of the world's most significant carbon sinks, with an annual capacity of about 830 Tg. Mitsch et al. (2013) identify additional functions as water quality enhancement, disaster mitigation, coastal protection, and life protection. These wetlands represent South Kalimantan's local potential. Kembang Island is one of the wetland areas in South Kalimantan, specifically in the Barito Kuala Regency. Kembang Island is a swamp in the middle of the Barito River with a form of mangrove forest ecosystem where long-tailed macaques and proboscis monkeys live (Nurhidayah, 2021). On Kembang Island, numerous interactions between living organisms or between living organisms and their environment occur. This region is also a popular tourist destination that has a significant impact on the local economy. According to research by Rahmawati and Atmojo (2021), various types of an area's potential can be utilized as a learning resource. The most recent innovation combines the local potential of Kembang Island as a scientific learning theme with a webbed integration model to realize student learning experiences.

Using the described issues as a starting point for local potential has a great deal of learning application potential. At this point, however, there has been no research on the local learning potential of "Kembang Island," particularly with regard to science. Therefore, this study was conducted to investigate the science concepts inherent in the local potential of Kembang Island and how to integrate the local potential of "Kembang Island" into science learning.

METHOD

This qualitative descriptive study examined the integration of local potential in science learning (Widyaningrum & Prihastari, 2020). The

objective of this study was to identify and reconstruct the local potential for science learning on Kembang Island. South Kalimantan's Kembang Island, located in the centre of the Barito River, was the focus of this study. A data collection instrument was an observation sheet. The collection of data was conducted by observing the Kembang Island region, followed by a review of seventh-grade science material and fundamental scientific competencies. Descriptive qualitative data analysis was performed to reconstruct the local potential of Kembang Island to be integrated into science learning.

RESULTS AND DISCUSSION

Kembang Island

South Kalimantan is located between 1°21'49" and 4°10'14" north of the Equator and 114°19'13" and 116°33'28" east equator. Its geography includes lowland regions on the west and east coasts. The Meratus Mountains border the middle section. The lowland region is dominated by peatlands and swamps, making it an abundant source of biodiversity among freshwater animals (Sidiyasa, 2012). As the provincial capital of South Kalimantan, Banjarmasin is known as the City of a Thousand Rivers. Its 72 square kilometres are dominated by deltas and islands. There are twenty-five tiny islands surrounded by rivers. Tatas Island, Kelayan Island, Rantauan Keliling Island, Insan Island, Flower Island, and others are among the islands (Khoirunnisa et al., 2017).

The naturally formed islands surrounding Banjarmasin are utilised as tourism destinations. Kembang Island Nature Park is one of them. The Kembang island is located south of Banjarmasin. As a delta in the middle of the Barito River, Kembang Island is home to several South Kalimantan endemic species that were subsequently designated as a natural tourist park.

Kembang Island has conservation significance as a water buffer in the Barito River. Conservation is intended for wildlife habitats, such as grey macaques (*Macaca fascicularis*) and proboscis monkeys (*Nasalis larvatus*), as well as historical relics (sacred) sites of worship for people of Chinese descent (Barito Kuala Regency, 2021). This location has potential as a tourist forest with habitat for long-tailed macaques. On Kembang Island, visitors may stroll through the forest. Using a ketotok and the river, one can reach the region of Kembang Island. Along the path, visitors can observe life and community activities along the riverbank. The availability of ketotok rental services as a mode of conveyance demonstrates that Kembang Island is a potential economic contributor to the surrounding area. Moreover, Kembang Island, which is utilised as a tourist attraction, offers employment opportunities to the surrounding community. Obtaining income from the Kembang island region can increase regional income (Hartanto et al., 2013; Malik & Mulyono, 2017).

In addition to its potential as a recreation destination, Kembang Island has additional benefits. The area with beautiful forests and numerous ecosystems, including swamp ecosystems, rivers, and the forest itself, is explorable. This area must be developed further, including in the field of education. Education as a platform for learning must be able to attract and integrate this potential so that the area can be further developed and preserved (Baquete et al., 2016; Ilma & Wijarini, 2017; Morris et al., 2021; Nurmalasari et al., 2019).

Science Concepts on Kembang Island

a. The Ecosystem

An ecosystem is a system of interdependent relationships (interactions) between the living and nonliving components that comprise

it. There are biotic and abiotic components that make up an ecosystem. There are numerous varieties of ecosystems, including terrestrial ecosystems, marine ecosystems, and desert ecosystems, among others (Hotden et al., 2008). Kembang Island is one of the river ecosystems dominated by mangrove forests, and is therefore referred to as a mangrove forest ecosystem. The Kembang island is home to long-tailed macaques and proboscis primates. Long-nosed, reddish-brown Proboscis primates are endemic to the island of Borneo and are found in mangroves, swamps, and coastal forests. Because rambai is a food source for proboscis monkeys, Kembang Island, which is part of the rambai mangrove forest ecosystem, is a suitable habitat for these primates. What are the patterns of interaction within the ecosystem of Kembang Island? As a mangrove forest ecosystem, Kembang Island displays interaction patterns in both land and aquatic areas. Furthermore, fertile rambai trees can serve as a food source for proboscis primates, which interact with biotic and abiotic components such as the rambai trees that thrive on Kembang Island due to the favourable geographical conditions there.



Figure 1 Mangrove trees on Kembang Island (Personal Documentation)



Figure 2 Mangrove trees on Kembang Island (Personal Documentation)

b. Environmental pollution

Kembang Island, which is situated in the centre of the Barito River, is a strategic location for all human activities in addition to being a tourist destination. Kembang Island is one of the natural tourist parks overseen by the district administration of Barito kuala. The development of the island as a tourist destination affects the convenience of visitors. The increased number of visitors to Flower Island has an effect on the hygiene of the region. Many visitors bring a large quantity of packaged food and beverages and dispose of their trash irresponsibly. The accumulation of trash in the Flower Island area alters the Flower Island area's condition. Environmental pollution refers to the deterioration of the environment as a result of substances, energy, and/or other components. Air, soil, and water pollution are the three types of environmental pollution (Khoirunnisa et al., 2017; Susanto et al., 2021). The accumulation of refuse in the region of flower island indicates the presence of soil and water pollution.



Figure 3 Pollution on Kembang Island



Figure 4 Pollution on Kembang Island



Figure 5 Pollution on Kembang Island

c. layers of the Earth and Disasters

A delta called Kembang Island can be found in the Barito River's center. River sedimentation contributed to the formation of this island. Kembang Island's sedimentation is created by the upstream river flow that drains into the Barito River. The creation of deltas happens gradually and continuously. The Barito Delta's landforms include those produced by maritime processes, fluvial processes, and biological processes (peat). Tidal flats, shoals, gravel, sand, dust, clay, and mud are examples of landforms with a marine origin. Natural

embankments made of gravel, sand, dust, clay, and silt, as well as horseshoe-shaped lakes made of the same materials, are among the landforms of fluvial origin. Peat anticlinal wings of gravel, sand, dust, clay, and mud, as well as peat anticlinal basins of gravel, sand, dust, clay, and mud, are examples of organic landforms, which are landforms with peat deposits (Arisanty, 2014). In addition to having Kembang Island, which is located at a height of 0 meters above sea level and whose lithosphere layer type is affected by Kembang Island's formation process, this island can flood if the Barito River undergoes evaporation.



Figure 6 View of Kembang Island from Google Maps

Mapping of Basic Competencies integrated in Kembang Island

The results of the analysis of science concepts in the local potential of Kembang Island show that there were three materials that could be integrated, namely ecosystems, pollution, earth layers and disasters. Based on the results of the study on the science learning syllabus, there are several suitable materials including KD 3.7, KD 3.8 and KD 3.10. The description of the material used in this study is in Table 1.

Table 1 Core Competencies and Basic Competencies

| Basic Competencies | Material |
|---|---|
| 1.7 Analyse the interactions between organisms and their environment, as well as the population dynamics resulting from these interactions | Mangrove forest ecosystem |
| 1.8 Analyse the occurrence of environmental pollution and its effects on ecosystems | Soil pollution and river pollution of Kembang Island area |
| 3.10 Describe the layers of the earth, volcanoes, earthquakes, and risk reduction measures before, during, and after disasters according to the threat of disasters in the area | Lithosphere/soil layers in the Kembang Island region and Flood disaster in Kembang Island |

(Kemendikbud, 2017)

Table 1 demonstrates how Kembang Island can be incorporated into education. The mapping of the Basic Competencies was used as a reference to create indicators to be further elaborated in the learning objectives. The objective was to attain the desired level of competency. This mapping would serve as the foundation for developing the optimal learning design.

Science Learning Design integrated with Local Potential "Kembang Island"

The results of integrating fundamental competencies with the island of Kembang served as the foundation for the development of learning designs. The mapped Basic Competencies would serve as the basis for the development of lesson plans, instructional materials, and assessment instruments. Integrated science learning facilitated the incorporation of more recognizable materials for students. One of them was the webbed integration model, which emphasized teaching material in the form of contextual themes or according to ordinary life. The pertinent content is contained in Basic Competencies 3.7, Basic Competencies 3.8, and Basic Competencies 3.10, which is then integrated into a single theme entitled "My Environment at Flower Island Tourism Park." Figure 4 shows subthemes based on Basic Competencies integration using the webbed model.



Figure 7 Webbed Integration Model Chart

The webbed integration model is depicted in Figure 7 as a chart with one main theme and three subthemes according to the Basic Competencies. This model would enable students to comprehend the material through the application of commonplace concepts. The results of the material study as a learning resource were then presented in the form of learning assists for classroom use.

Based on preliminary studies of school learning tools such as lesson plans, package books, and examination questions. This provides a solid rationale for why material presented in the form of themes can be presented as lesson plans, student worksheets, handouts, and evaluation / assessment tools. The purpose of creating lesson plans was to organize the implementation of learning. To ensure that learning conforms to the mandate of the applicable 2013 curriculum, namely student-centered

learning, learning was designed using discovery learning, which consists of six stages of learning activities beginning with stimulation, problem statement, data collection, data processing, verification, and generalization. The instruction plan was divided into three sessions based on the subtheme division of the webbed integration model. The learning process could be optimized if it were supported by the appropriate instructional materials. Therefore, in this study, the integration of local potential was represented by handouts and student worksheets. Three sub-themes were used to locate information about Kembang Island. The concepts contained in the handout must be independently discovered by pupils using student worksheets. Student worksheets known as discovery learning. In addition to activating students, the purpose of this model was to give them the opportunity to investigate their ability to find information.

Effective implementation of learning must be accompanied by assessment/evaluation as a tool to control implementation of learning. Attitude, knowledge, and performance competencies are measured by means of evaluation instruments. Assessment tools can integrate both test and non-test instruments (Zakwandi, 2021). Test instruments can take the form of multiple-choice questions, essays, matching exercises, etc. In contrast, non-testing instruments may take the form of questionnaires or observation documents. The preparation of instruments is modified according to the to-be-measured aspects and indicators of competence.

CONCLUSION

Based on the research conducted, the local potential of "Kembang Island" could be contextually and practically integrated into science learning. There are three scientific concepts on Kembang

Island: ecosystems, pollution, earth layers, and disasters. The three core competencies were then adapted to the science learning integration model, specifically the webbed integration mode. This model emphasizes on a theme, and as a result, "My Environment at Kembang Island Nature Park" emerged as a major theme. The learning presentation was outlined in the learning implementation plan and supported by student worksheets and handouts. Through a comprehensive examination of science/science concepts and competency mapping, local potential could be integrated into science learning. In addition, this is the basis for introducing the younger generation to the cultural diversity and uniqueness of a region.

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