

The integration of Palembang's local potential in natural science learning materials

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Abstract. Learning science is not just for memorizing concepts and materials, but students are expected to be able to apply science in everyday life. The approach that can be used in learning science and making students accustomed to science in their lives is a contextual approach, where students will learn science very interestingly, through direct and meaningful experience. Nowadays natural science learning does not apply a contextual approach as a whole. Integrating Local Potential with the material or content of natural science is one step that can be done to make learning science meaningful because it is very close to the daily lives of students. This research is a descriptive quantitative study with data collection methods through interviews, observations and also literature studies. The results of the study information that there are 22 local potentials of Palembang with 16 of them having a content of natural sciences so that they meet the criteria for being a source of learning and 6 others do not have a significant natural sciences content. The content of science that can be taught through local potential includes material in grades VII, VIII and IX of Junior High School.

Keywords: *local potential of Palembang, learning material, natural science integration*

1. Introduction

Natural Science is defined as a study to understand the universe, obtain knowledge and apply it in everyday life where the true nature of science is a way of thinking, a body of knowledge and a way of investigating [1]. Science learning must influence students not only to memorize but also to process information in the form of new knowledge that can help in their activities [2]. Student learning achievements, especially in natural science subjects are still low, this is evidenced by the results of the UN [3], according to data from the Ministry of Education and Culture the percentage of students who answered correctly in natural science subjects is still relatively low. The ability of Indonesian students on an international scale is still very far behind, where Indonesia ranks 45th with a score of 397 out of 48 countries in the TIMSS (Trends in International Mathematics and Science Study) ranking. The low learning achievement of students in Indonesia occurs because learning in schools does not optimize the application of the true nature of science [4]. The process of learning science in schools only emphasizes cognitive processes in memorizing facts, concepts, and principles that are merely memorizing but not accompanied by understanding and application in life [5]. This certainly



contradicts the opinion which states that learning science is not only about cognitive theory and removing affective values, but must also include ethics, motivation, and values [1]. Contextual learning is one of the solutions to these problems, where science must be taught interestingly and enjoyably [6]. Science is taught to students with direct experience and related daily life with contextual learning that can make students familiar with Science as well as Science Everywhere [7], [8].

Science Everywhere is a program that combines science with everyday life, which is designed to help students connect science with their daily lives [3]. Indonesia, which has a unique variety in each region, is a distinct advantage for applying the science everywhere program [9]. Indonesia has a diversity of crafts, culture, arts, culinary, diverse ethnicities, languages, traditions, races and other characteristics that have the attraction and uniqueness in each region and can be used as a good source of learning [10]. Natural science learning and its integration with local potential becomes very important in this era of globalization as one of the solutions to balance cognitive abilities, affective, social life, ideas, values and habits of the community that must be consistent with the needs of individuals, communities, community and country. The local potential of each region is useful to help student activities because they use learning resources that are close to their schools, and help teachers to more innovative in teaching [11].

We all know that one of the very attractive local potentials of Indonesia is its Culinary diversity which differs from one region to another. Palembang is a city with a variety of culinary that is widely known both locally, nationally and internationally, for example, pempek, tekwan, models, celimpungan, bolu kojo and others [12]. Palembang's special culinary is included in the local material that can be used as a source of learning. as well as other local potentials such as culture, crafts, and others. Learning resources that contain local material can deepen students' understanding in learning because it uses a contextual approach that is close to the daily lives of students [13]. Palembang's local potential consists of various types can be an effective alternative learning source because it is close to the school environment and students' homes.

Palembang people are very attached to their unique local potential. However, based on observations in Palembang city schools, they have never utilized local potential, especially as a source of learning in their schools. Until now, natural science learning has never even integrated the material in science with the specificity of the region. Previous research shows a mapping of material from human physiology courses shows that the local potential of Palembang can be used as additional teaching material that is suitable for lecture topics, for example, pempek which is integrated with digestive material [11]. Other research states that learning with local potential of wood carving and pottery has significant results and has an effect on student learning outcomes. In line with the many other studies that make the local potential of the region as a source of learning proves that the uniqueness of an area is very interesting to study, especially integrating the issue of local potential, including the specificity of Palembang in the science learning materials. exploration of learning resources integrated with the local potential of Palembang City is very necessary, especially in the culinary, handicraft, arts and sports fields.

Globalization is a challenge in applying local potential as a source of contextual learning for students [10]. the teacher's task to socialize local potential is very important, so that globalization will not be biased for the existence of local potential and students can interpret the value of local wisdom as a whole through learning science in schools [10], [11]. Exploration to study science learning materials that are integrated with Palembang's local potential needs to be carried out, bearing in mind the infrequent use of local potential as a source of student learning in Palembang City and South Sumatra in general. The purpose of this study is to explore and assess the charge of material science in a variety of local potential Palembang to eventually serve as a source of learning in the natural sciences lessons for learners.

2. Research method

The method in this research is descriptive quantitative method. The study was conducted in Palembang. Data was collected by interviewing, observation and study of literature. Local materials

Palembang eligibility Data analysis were descriptively and look valid or not the local potential to be integrated in the learning of natural science.

The indicators related learning resource assessment of local potential that will be assessed include a) economic, local potential is said to be economical if the school is close to the distance learning resources; b) practical, if the learning process using local potentials typical cuisine can be carried out easily; c) flexible, local potentials can be said flexible if it can be used in a variety of learning objectives and d) compliance with the learning objectives, the components of the learning resources have compatibility with the learning objectives[11]. The average value of the criteria of the learning resources that have been converted then assessed the feasibility of the local potential to be used as a learning resource that can be seen in table 1.

Table 1. Criteria for eligibility of learning resources.

Range	Explanation
3.1 – 4.0	Very meet criteria (SMK)
2.1 – 3.0	Meet criteria (MK)
1.1 – 2.0	Does not meet criteria (TMK)
0.0 – 1.0	Very does not meet criteria (STMK)

3. Results and Discussion

Observations carried out to obtain an overview and data some local potential (local materials) that if it can be used as a source of learning and integrate it in the material science learning at the junior level. Observations and interviews resulting in 22 local potential Palembang area that looks potentially have a charge of natural sciences and can be used as a learning resource. 22 local potential is then analysed for feasibility, then obtained the facts as in table 2.

Table 2. Result of eligibility Palembang local potential.

No	Local Potential Group	Local Potential Forms	Value	Information
1	Culinary	Pempek	3.5	SMK
		Tekwan/Model	3.5	SMK
		Kemplang and Fish Cracker	2.75	MK
		Laksan	2.75	MK
		Celimpungan	2.5	MK
		Celor noodle	2.75	MK
		Bolu Kojo	2.5	MK
		Sekayo	2.5	MK
2	Regional Arts	Tutur Cerita	1	TMK
		Gending Sriwijaya Dance	2	TMK
		Tanggai Dance	3.25	SMK
		Pagar Pengantin Dance	1	TMK
		Dul Muluk	1	TMK
		Kolintang	3.5	SMK
3	Handy craft	Songket	2.5	MK
		Cupboard Carving (Lak)	2.5	MK
		Lihab	2.5	MK
		Limas House	2	TMK
		Rakit House	2	TMK
		Telok abang	2	TMK

No	Local Potential Group	Local Potential Forms	Value	Information
4	Sports	Lomba Bidar	2.75	MK
		Midang	3.5	SMK
		Pincak	1	TMK
		Betangas	2.75	MK

Based on the results listed in table 2, 16 local potentials meet the criteria for being a source of learning that has the content of natural science in them, while there are 6 local potentials that cannot be used as local material in learning science. Local potential does not meet these criteria caused by many factors ranging from its existence which is already scarce such as Telok abang which also cannot be found every day but we can find it during the Eid al-Adha celebration and also Indonesia's Independence Day, other factors that also affect is the distance between learning resources with the school environment, for example, the existence of a rakit house and limas house is very far from the school because not all schools in the Palembang are close to this type of house, even for some regional arts such as the pagar pengantin dance it is not flexible to be taught in learning Science because this dance performed by the bride during the Palembang traditional wedding procession, while in terms of basic competence there are local Palembang potentials that are not in accordance with the Junior High School science content, for example, Drama Dul Muluk and Tutar cerita that are more suitable if integrated Include language learning compared to science.

Furthermore, 16 local potentials which are grouped into four large groups and has the potential to be used as a learning resource that can be integrated within Natural science for Junior High School material adapted to the basic competence of each Natural science. A summary of the types of local potential has been mapped with utilization outline will be presented in table 3.

Table 3 Content of natural science in the local potential of Palembang

	Local Potential	Natural Science Content	Basic Competencies	Learning Application
Culinary	Pempek	Classification of Material and Changes	3.3 and 4.3 VII grade	Pempek made of diverse materials that will form a mixture and will be transformed into a delicious food typical of Palembang, which like other foods that will be stale in time pempek also change. This local potential can be an example when teaching science content about the classification of material and its changes
		Digestive System	3.5 and 4.5 VIII grade	Pempek contains many nutrients needed by the body so that it will later go through the process of digestion in the digestive organs. Therefore Pempek can be used as an example to teach the topic of the digestive system and be used as a project and student activity.

Local Potential	Natural Science Content	Basic Competencies	Learning Application
Tekwan / Model	Digestive System	3.5 and 4.5 VIII grade	Basically the ingredients for making tekwan / model are the same as making pempek so that the model / tekwan also contains nutrients needed by the body so that it will later go through a process of digestion in the digestive organs. Therefore tekwan / model can be used as an example to learn the topic of the digestive system
	Additive and addictive substances	3.6 and 4.6 VIII grade	The making of tekwan / this model uses a lot of natural ingredients and also substances such as flavourings, sweeteners and so on so that it can also be used as local material that teaches science content on additive and addictive substances
Kemplang/ Fish Crackers	Temperature and changes	3.4 and 4.4 VII Grade	The process of making kemplang and fish crackers is closely related to temperature, where one of the ways to make crackers when fried will be more expanded, the raw material of the kemplang must be dried in the sun and then fried or roasted, and the process of frying also baking local products will also teach the concept of expansion in natural science material
Celimpungan	Digestive system	3.5 and 4.5 VIII Grade	Celimpungan contains many nutrients needed by the body so that it will later go through the process of digestion in the digestive organs. Therefore celimpungan can be used as an example to teach the topic of the digestive system and be used as a project and student activity.
Celor noodle	Digestive System	3.5 and 4.5 VIII Grade	Celor noodles contain lots of nutrients needed by the body so that it will later go through the digestive process in the

	Local Potential	Natural Science Content	Basic Competencies	Learning Application
	Laksan	Digestive System	3.5 and 4.5 VIII Grade	digestive organs. Therefore this celor noodle can be used as an example of local potential to teach the topic of the digestive system and be used as a project and student activity. laksan contains many nutrients needed by the body so that it will later go through the process of digestion in the digestive organs. Therefore this Laksan can be used as an example of local potential to teach the topic of the digestive system and be used as a project and student activity.
	Bolu Kojo	Classification of Material and Changes	3.3 and 4.3 VII grade	Bolu Kojo made of diverse materials that will form a mixture and will be transformed into a delicious food typical of Palembang, which like other foods that will be stale in time bolu kojo also change. This local potential can be an example when teaching natural science content about the classification of material and its changes
Regional Arts	Tanggai Dance	The motion of objects and living things in the surrounding environment / motion system	3.1, 3.2 and 4.1, 4.2 VIII grade	Dancing activities use a variety of movements that involve muscle function and joints where the dance will be very suitable to be used as an example of local material in learning science movement system material
		Circulatory system	3.7 and 4.7 VIII grade	Dancing will affect muscle function in human blood vessels. This local potential can be applied as an example or project material factors that affect heart rate, blood pressure and blood flow in the human circulatory system
	Kolintang	Vibrations, Waves, and Sounds in life	3.11 and 4.11 VIII Grade	Kolintang is one of the musical instruments commonly used by people of Palembang in

	Local Potential	Natural Science Content	Basic Competencies	Learning Application
Handy craft	Songket			traditional events where, because it is a type of musical instrument that causes sound waves, it will be very interesting to make an example in learning with science materials
		Constituent particles of objects and living creatures	3.8 and 4.8 IX Grade	Songket is a typical cloth that is woven manually. The fabric used has the constituent particles and it can be used as an example in learning the material constituent particles
		The motion of objects and living things in the surrounding environment / motion system	3.1, 3.2 and 4.1, 4.2 VIII grade	Weaving activity using various movements that involve muscle function and also the joints where the weaving will be very suitable to serve as an example of local materials in science learning material motion system
	Lihab	Circulatory system	3.7 and 4.7 VIII grade	Weaving movement will affect muscle function in human blood vessels so that the local potential can be applied as an example or project material factors that affect heart rate, blood pressure and blood flow in the human circulatory system
		Constituent particles of objects and living creatures	3.8 and 4.8 IX grade	Lihab is typical Palembang mattress that is made, linen and cotton used in its manufacture has material with constituent particles, so it can serve as an example in teaching constituent particles of material objects and living creatures
		The motion of objects and living things in the surrounding environment / motion system	3.1, 3.2 and 4.1, 4.2 VIII grade	Mattresses lihab making activity using various movements that involve the function of muscles and joints also make mattresses lihab which would be very suitable to serve as an example of local materials in science learning material motion system

	Local Potential	Natural Science Content	Basic Competencies	Learning Application
		Circulatory system	3.7 and 4.7 VIII grade	Lihab own motion makes this mattress will affect muscle function in human blood vessels so that the local potential can be applied as an example or project material factors that affect heart rate, blood pressure and blood flow in the human circulatory system
	Palembang Cupboard Carving	Constituent particles of objects and living creatures	3.8 and 4.8 IX Grade	Palembang cupboard carving are Palembang's own custom cupboard, the wood used and the paint used in its manufacture have materials with the constituent particles, so they can be used as examples in learning the material making up objects and living things.
		The motion of objects and living things in the surrounding environment / motion system	3.1, 3.2 and 4.1, 4.2 VIII grade	The activity of making a Palembang cupboard is a special cupboard that is made by yourself, using various kinds of movements that involve the function of muscles and joints were making this carved cupboard will be very suitable to be used as an example of local material in learning science.
		Circulatory system	3.7 and 4.7 VIII Grade	The movement to make the carving cupboard itself will affect the muscle function in human blood vessels. This local potential can be applied as an example or project material factors that affect heart rate, blood pressure and also blood flow in the human circulation system
Sports	Bidar	Simple motion, business and aircraft systems	3.3 and 4.3 VIII Grade	This sport requires skill in moving the paddle and a strong effort to steer the boat remains stable. The use of paddles and boats bidar also uses simple equipment. So that bidar becomes one of the typical

Local Potential	Natural Science Content	Basic Competencies	Learning Application
Midang	The motion of objects and living things in the surrounding environment / motion system	3.1, 3.2 and 4.1, 4.2 VIII Grade	local potentials which can also be used as a learning resource for science Midang activity or walk / run in the morning or evening using a variety of movements that involve the function of muscles and joints also where midang would be very suitable to serve as an example of local materials in science learning material motion system
	Excretion system	3.10 and 4.10 VIII Grade	Walk or run requires a lot of energy and make the body effect into heat, so the body will perform homeostasis by transpiration. Midang would be very suitable to serve as an example of local materials in materials science learning human excretion system
	Circulatory System	3.7 and 4.7 VIII Grade	Jogging and walking will affect muscle function in human blood vessels so that the local potential can be applied as an example or project material factors that affect heart rate, blood pressure and blood flow in the human circulatory system
	Human Respiratory System	3.9 and 4.9 VIII Grade	Running and walking sometimes increase oxygen demand so it is not surprising that when we run we will breathe more air and release CO ₂ or breathe. Causing betangas can serve as an example in materials science
Betangas	Excretion system	3.10 and 4.10 VIII Grade	Walk or run requires a lot of energy and make the body effect into heat, so the body will perform homeostasis by transpiration. Midang will be very suitable to be used as an example of local material in the learning of science material system of human excretion
	Circulatory	3.7 and 4.7	Betangas activities will affect

Local Potential	Natural Science Content	Basic Competencies	Learning Application
	System	VIII Grade	the dilation of human blood vessels so that blood flow becomes faster. This local potential can be applied as an example or project material factors that affect heart rate, blood pressure and also blood flow in the human circulatory system

Table 3 informs that the local potential originating from the city of Palembang, South Sumatera has a science content that is very closely related to the daily lives of students and can be a new step to learn science contextually and students are more accustomed to science in their lives. The local potential of Palembang City is an alternative for teachers to develop science teaching materials and the student more attractive to learn them. Learning with local potential as a material is not difficult, because local potential can be taught both inside and the outside of classroom and it can be taught with models and methods of learning in general. But, until now the use of Palembang's local potential as a source of learning is not very developed, although in fact by learning the integrated natural sciences of local potential will foster a love of local potential itself in students. Palembang City has 22 local potentials after based on observations, interviews and literature studies. These local potentials can also be grouped into 4 types: Culinary Wealth, Regional Arts, Crafts, and Sports. There are also local potentials that were successfully observed which are the original culture of Palembang, but those that are mixed cultures. The 22 local potentials are group to 16 local potentials can be utilized by the teacher to provide examples or project assignments for students in learning natural science, these local potentials can be integrated with the materials in Junior High School grades VII, VIII and IX and very interesting. Pempek is one example of local potential that is very well known in the city of Palembang, South Sumatra and Indonesia. It will be very unique if Pempek can be studied more deeply to be able to know the overall contents of the science in it, one of the many natural contents contained in Pempek is a topic digestive system. In addition to Pempek, of course, all of this local potential can be used as a source of learning in science.

The first category of local potential Palembang is the culinary riches. Palembang is a city with a variety of culinary types, such as pempek, models, tekwan, kemplang, kerupuk ikan, bolu kojo, celimpungan, laksan, sekayo and so on. These culinary are very familiar among the people especially Pempek who are very well known. Unique culinary Palembang can meet the criteria of good learning resources as it can be integrated with some of his special IPA KD 3.5 and 4.5 of the digestive system. These culinary will also prioritize contextual learning and personal experience considering that all students in the city of Palembang are certain to know most of the culinary specialties of the city of Palembang.

The second and third categories are Regional Arts and Crafts. Indonesia has a lot of regional art, including the city of Palembang with dance steps and kulintang music that meet the criteria as local potentials with natural science content so it can be used as a learning resource. Both of these local potentials are still very often encountered by students because dancing involves movements and then kulintang involves sound waves, it would be very appropriate if these two local potentials would be taught in the material of the motion system and also the sound waves. Songket weaving handicrafts, mattresses, and wood carvings are also crafts that utilize materials which certainly have different characteristics so that it will be very suitable if used as a source of learning in the characteristics of materials in contextual science learning.

The last category is sports, where the sample has a charge of IPA is bidar and midang. Both of these activities are sports practiced by people of Palembang. Bidar is a rowing boat race which is usually held on the anniversary of independence, where participants from this race are required to compete with one another in rowing the boat while midang is a morning or evening run or also morning walks in the afternoon. Bidar and midang, both of which require the ability of muscles and joints so that it is possible if you want to learn contextual science in the material movement system.



Figure 1. Pempek is the most popular local potential in Palembang and it can be integrated for natural science material.

Natural science is a compulsory subject for Junior High School students. However, learning natural science is currently still very minimal in schools with direct experience, it doesn't referring to a contextual approach and accustoming students to be friends with science. Learning natural science in Junior High Schools becomes less meaningful because students simply remember not to make natural science a part of their daily lives. The local potential is an alternative for teacher to conduct a contextual learning activity and accustom students to make natural science as part of the daily lives. Research on the use of local potential in the nature of learning has been done. Examples of research that use local potential to teach natural science in the fields of Physics, Biology, and Chemistry. For the example is the research about developing integrated physics learning resources for local potentials of the Saraba kawa train[13], then there is research on the use of batik jumpitan on natural science learning [9]. But the use of Palembang's local potential in learning has not been done and opened up opportunities for teachers from Palembang to develop it. Local potential with the content of natural science in it into a learning activity, teachers can also teach students how important it is to maintain the customs, culture and characteristics of their area through the preservation of local potential so that the local specialties will be maintained from generation to generation. Science learning is one step to direct students to know Palembang's local potential through contextual and meaningful science learning so that it is necessary to use local potential as a source of learning for students.

4. Conclusion

This research resulted in a list of 22 local potentials in Palembang, South Sumatera, with 16 types of local potential have natural science content and meet the criteria to be used as learning resources. Local potentials that meet the criteria are divided into 4 categories, namely culinary wealth consisting of pempek, model / tekwan, kemplang, celimpungan, laksan, celor noodles, bolu kojo and sekayo. Then the regional art category consisted of tanggai dance and Kolintang. The handicraft category consists of songket weaving, lihab mattress, and cupboard carving. The last category is the Sports which consists of Bidar, midang, and betangas. Natural science content that can be taught with local potential learning resources are digestive system materials, classification of materials and their changes, additive and addictive substances, temperature and changes, substances and changes, motion

systems, excretion systems, transportation systems, vibrations, waves and sounds, and particles making up objects and living things. Research that can be developed from the results of these observations is the development of learning tools, modules, pocketbooks or learning media by using local potential as the content of science material in it.

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