Preliminary analysis learning media based on edupark science with scientific methods in the national geopark of *Ranah Minang* Silokek of Sijunjung

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**Abstract.** The curriculum 2013 sets learning using resources which to be orientated toward potentials and uniqueness in each region. Learning resources that discuss the potential and uniqueness of the area called the education park (*edupark*). One of *edupark* in Sijunjung Regency that can be integrated with learning is The National Geopark of *Ranah Minang* Silokek of Sijunjung area which is still used as an *edupark*. The use of geopark can be used as an *edupark* that is integrated with current technological advances. Based on the need for learning resources there, a preliminary analysis will be done to each science material at the school by using Plomp development research. The data of research uses interviews and questionnaires based on learning parameters, learning resources, students' and environments' characteristics then the description of potential attractions that support it among them are waves, light, and sound. Based on the results of preliminary research conducted, it was found that students were interested in learning involving the media.

1. **Introduction**

Indonesia grants authority to education units to develop study materials or subjects that contain content and learning processes about the potential and uniqueness of the region to shape students' understanding of the potential and uniqueness in the area of their residence [1]. Interactions that are intertwined in learning with the environment are expected to provide intact experiences that help students to gain more knowledge. Connecting the content of subject matter with the environment that is useful in motivating students to connect knowledge and applications with their lives as members of the family, community and work environment is contextual learning [2]. Contextual learning is contained in natural science could be a collection of knowledge about everything that goes around that is arranged in a sequence where the subject is nature and everything in it.

Circumstance and events that are often encountered and observed out in life that has known not all of them to have a link with science subject matter at the school. Science is a study of natural events by observing according to established procedures to obtain a conclusion [3]. Learning science is easier to understand using a scientific approach. In facilitating the learning process with a scientific approach,
educators can utilize the media in learning. Besides, the use of media also facilitates the achievement of objectives in learning [4]. And, avoid the learning process that focuses on the transfer of concepts, theories, and scientific facts, but also to understand the concepts of science in the natural environment, especially in natural cave tourism objects. For example, material echoes, a type of sound that occurs before the original sound is finished [5]. Such activities are often carried out by students when they are in the cave. They can hear as if someone is following their voice while speaking. Even though their activities are a matter of science at the school, they are not aware of it.

Students' knowledge of the environmental learning material is the potential to develop learning methods based on student characteristics and regional potential following the demands of the 2013 Curriculum. The edupark is an educational park that creates value for students' educational learning targets. Exploitation methods of work tours and effective tours of local models have been used in social science [6]. One of the potential learning takes advantage of edupark is the tourist attraction in The National Geopark of Ranah Minang Silokek of Sijunjung.

Silokek is one of the potential tourist areas in Sijunjung Regency, West Sumatra, Indonesia. A natural tourist area that is found along in Nagari Muaro, Silokek and Durian Gadang that reached 1300 Km² that is located in Sijunjung and Sumpur Kudus Regency with a population of 68,000. The location of this is about 145 kilometers or around four hours ground trip from Padang city or 20 KM or 45 minutes from downtown Muaro Sijunjung. The National Geopark of Ranah Minang Silokek of Sijunjung is located in a geographical position of 0037°23.75" South Latitude, up to 10100°14.07" East Longitude, if it is from a satellite can be seen in Figure 1.

Since April 25th, 2019, The National Geopark of Ranah Minang Silokek of Sijunjung is inaugurated by the Governor of West Sumatra, Irwan Prayitno then entered in one of the National geopark areas. With this determination, this tourist attraction has the full name of The National Geopark of Ranah Minang Silokek of Sijunjung, Indonesia. Natural entities can be used by the students in understanding the concept of science that implements natural events through various scientific steps while still paying attention to the scientific attitude that is formed so that a natural and artificial scientific product is produced [7]. The National Geopark of Ranah Minang Silokek of Sijunjung offers a destination in the form of a stunning white sand beach atmosphere, the beauty of charming panoramic rock-lined canyons, natural cave tours (ngalau), enchanting orchid gardens, rock climbing, white water rafting, and waterfall settlement. Natural cave tourism is more accessible and does not recognize certain agendas such as rock climbing, and arum rapids. In addition, the natural cave also offers various kinds of scientific concepts that can be used in learning. The shape of the natural cave and the relation to the scientific concept of the geopark can be seen in Figure 2.

Science learning rarely involves geopark. If learning science does not interact directly with nature, transferring the subject matter is not optimal. Thus, researchers analyzed and perform a possible description of the potential edupark on attractions that support learning material in The National geopark of Ranah Minang Silokek of Sijunjung. This research is limited to destinations in the form of natural caves. In general, the concepts of natural science concepts found in these destinations include vibrations, waves, light, sound, and optical tool in life. Under with curriculum 2013 demands on the second of eighth grade.
Figure 1. Location map of The National Geopark of Ranah Minang Silokek of Sijunjung (a). Map of Republic of Indonesia; (b). Map of West Sumatera Province ; (c). Map of Sijunjung Regency

Caption:
1. Resonance (Sound waves)
2. The sunshine (Lightwaves)
3. Human eyes (Optical AIDS)
4. Human ears
   (Vibration/resonance)

Figure 2. The Natural Cave forms and link on scientific concept at The National Geopark of Ranah Minang Silokek of Sijunjung.
Research Method
This research is conducted in SMP IT Kautsar Ilmi Sijunjung was the subject of students’ research taken on randomly and also science teacher there. The object of research is The National Geopark of Ranah Minang Silokek of Sijunjung. This research uses the Plomp method. This research has only reached the stage of a preliminary investigation that is the stage of gathering and analyzing information, defining problems and continuing the project [8]. The data of the research is gained from interviews and questionnaires that are developed based on the learning parameter. Learning tools, characteristic and environment of students than the description of potential tourism objects that support science learning materials. Questionnaires are shared with the teacher and students. Meanwhile, a score of questionnaires uses a Likert scale. The Likert Scale was developed by Rensis Likert, a series of items. Respondents only give their agreement or disagreement with the items [9].

Table 1. Questionnaires Scores of Teacher and Student

| Statement     | Score |
|---------------|-------|
| Always        | 4     |
| Often         | 3     |
| Sometimes     | 2     |
| Never         | 1     |

The data of the analysis technique uses quantitative and qualitative descriptive statistical analysis techniques. The Quantitative descriptive technique is calculated from the percentage of the number of respondents’ scores based on the scoring of each answer by using this formula [10]:

\[ V = \frac{X}{Y} \times 100\% \]  

Notes:
- \( V \) = Final Score
- \( X \) = Score obtained
- \( Y \) = Maximum Score

The percentage of the respondents' responses to the suspension is categorized qualitatively as in Table 2.

Table 2. The Percentage of Category Divided [11]

| Percentage (%) | Category      |
|----------------|---------------|
| 76-100         | Good          |
| 56-75          | Good Enough   |
| 40-55          | Not Bad       |
| Less than 40   | Bad           |

Result and Discussion
Preliminary analysis of this research includes an analysis of students, curriculum analysis, material analysis and analysis of potential areas that obtained based on the parameters of the learning process, learning tools, characteristics of students and environmental characteristics, and the descriptions of the potential edupark on The National Geopark of Ranah Minang Silokek of Sijunjung especially those supporting science subject matter. Questionnaire analysis of teacher consists analysis of performance and the learning process. Performance analysis includes 7 aspects including learning tools, learning steps, utilization of printed
learning materials, utilization of non-printed learning materials, making printed learning materials, making non-print learning materials, and another tools and supplies as shown in Table 3.

Table 3. Analysis of Teacher’s Performance Aspect

| Number | Aspect                                      | (%) Result | Yes | No |
|--------|---------------------------------------------|------------|-----|----|
| 1.     | Completeness of Learning tool               | 100        |     |    |
| 2.     | Application of Learning step                | 83.33      | 16.67|    |
| 3.     | Utilization of Printed learning material    | 60         | 40  |    |
| 4.     | Utilization of Non-printed learning material| 20         | 80  |    |
| 5.     | Making printed learning material            | 30         | 70  |    |
| 6.     | Making non printed learning material        | 50         | 50  |    |
| 7.     | Completeness another tools and supplies     | 20         | 80  |    |

Based on Table 3 above, it is found that the completeness of learning tools by the teacher has reached 100%. It means that teacher has made the learning tool as appropriate, in the aspects of the application of learning steps, the teacher has implemented some of the learning steps is 83.33%, in aspect of the utilization of printed learning materials have used is 60% while in the non-printed learning materials for fresh student on a small portion is 20%. Then in the aspect of making learning materials both printed and non-printed, the teacher has not been able to make it is 50% while another tools and supplies at the school have been owned and not yet can be used fully is 20%. Therefore, it needs a learning material under the potential of the region and the achievement of learning objectives of students. Broadly, it can be concluded that teacher still has not yet applied the learning that utilizes tourism objects on the learning process. The teacher still carries out direct learning, student sheets that are used as learning resources are still far from the criteria. If it is much more for students can see, hear, say, and do something, so it is easier for them to learn [12]. To have the learning process that is accomplished by interactive. Communicative, motivating students to actively participate and a self-reliant are adapted to the talents of students’ physical and psychological development interest [13]. Therefore, it is needed a learning resource to utilize edupark for the implementation of science learning at the junior high school grade. Furthermore, the questionnaire of the learning process for teacher consists of 5 aspects; the interest of students in printed learning materials, the interest of students in non-print learning materials, Educational visit to edupark in science learning, the facts connection with science materials, the application of science learning with edupark as shown in Table 4:

Table 4. The Teacher Analysis on Learning Process Aspect

| Number | Aspect                                      | (%) Result | Category      |
|--------|---------------------------------------------|------------|---------------|
| 1.     | The interest of students in printed learning materials. | 52.5       | Not Bad       |
| 2.     | The interest of students in non-printed learning materials. | 62.5       | Good Enough   |
| 3.     | The facts connection with science materials. | 25.0       | Bad           |
| 4.     | Educational visit to edupark (educational park) in science learning. | 50.0       | Not Bad       |
| 5.     | The application of science learning with edupark (educational park). | 38.0       | Bad           |
Based on Table 4 above, it is found that students' interest in printed learning materials is 52.5% (not bad) and non-print learning materials is 62.5% (good enough). This indicates that students are interested in using both printed and non-printed learning materials. Next, the facts of connection science materials show that it is 25% (bad). It means that the teacher and students have not yet linked science materials to the facts in the environment. Then for aspects of the educational visit to edupark in science learning showed that is 50% (not bad), and the application of science learning with edupark showed that is 38% (bad). This shows that teacher and students at SMP IT Kautsar Ilmi Sijunjung have never visited and applied science learning to edupark. Hence, the use of edupark in learning is desperately needed. edupark that is utilized from the physical (natural) environment as a tool for studying natural phenomena or nature symptoms related to the concepts and principles of science can be used to study applications (concepts or principles of science) that are directly or indirectly utilized by the community in their activities [14].

The analysis of students includes 6 aspects. They are cognitive, Psychomotor, Initial ability, learning styles, learning resources, and motivating students to actively participate as shown in Table 5.

Table 5. Analysis of Students’ Aspect

| Number | Aspect          | (%) Result | Category     |
|--------|----------------|------------|--------------|
| 1      | Cognitive      | 59.55      | Good Enough  |
| 2      | Psychomotor    | 54.39      | Not Bad      |
| 3      | Initial Ability| 60.71      | Good Enough  |
| 4      | Learning Style | 59.33      | Good Enough  |
| 5      | Learning resources | 63.50 | Good Enough  |
| 6      | Motivation     | 68.54      | Good Enough  |

From an interview with a science teacher of SMP IT Kautsar Ilmi obtains information that The National Geopark of Ranah Minang Silokek of Sijunjung as an edupark had never been used. Thus, the student cognitive percentage is still 59.55% (good enough). The use of edupark in learning can improve students’ knowledge. On the other hand, the student psychomotor have not honed 54.39% (not bad). This low percentage is inseparable from the integration of edupark in learning. Then, the student initial ability score is 60.71% (good enough). Students’ initial intelligence of knowing and understanding is the task of a teacher. There are no stupid students. Every man is born with a lot of intelligence. It means that it has the potential to be developed. Although in the process of development and growth, human intelligence will be reduced by half [15]. Then, using appropriate learning methods and models will increase students' initial intelligence. As for student learning styles 59.33% (good enough). The use of edupark in learning is expected to represent diverse student learning styles. The percentage of new learning resources is 63.50% (good enough). It shows that learning resources that are still oriented towards the textbooks of teachers and students, it results in the percentage still low. At last, the percentage of motivation is 68.54% (good enough). It means that to make students more motivated in learning, then by making science learning as close as possible to the real-life of students so that they can make them enthusiastic in learning.
In addition, the results of observations that have been done at The National Geopark of **Ranah Minang Silokek of Sijunjung**, on this tourist attraction offers many destinations for visitors. The destinations offer a stunning white sand beach, the beautiful panoramic stone of lined canyons, tourist caves (**ngalau**), enchanting orchid parks, rock climbing, rafting and Pelukahan waterfalls. However, not all destinations are always available or only available at certain times, such as rock climbing, and rafting. The destination object of this research is natural cave tourist destinations (**ngalau**). Many scientific concepts can be found by students in this destination. The Application of wave, light and sound can be observed on the natural cave by students. Many scientific concepts can be felt and seen directly in real conditions also. There is several scientific concepts can be disclosed from these destinations can be seen in Table 6.

**Table 6. The Concept on Science on The National Geopark of **Ranah Minang Silokek of Sijunjung**

| Number | Name of Destination | The Concept of Science | Indicator of Competence Achievement |
|--------|---------------------|------------------------|-------------------------------------|
| 1      | Natural Cave (Ngalau) | 1. Vibration (Resonance) 2. Wave 3. Light 4. Sound 5. Optics | 1. Identify hearing mechanism in human 2. Identify the mechanism of the sonar system in animals 3. Identify the type of waves on the cave 4. Identify the type of lights 5. Analyze the type of sounds 6. Observe the mechanism of human eyes system by using optical devices likes camera |

Destination of the natural cave can be used as edupark where it can be seen on Tabel 6, there are many concepts of science can be revealed and are useful in the process of learning science. As demand in the standard of graduated competency which covers several aspects are affective, cognitive and psychomotor that edupark can be integrated into science learning in understanding scientific concepts. From the integration of edupark, it can help to shape the character of students such as saving energy, responsibility, discipline, social and environmental care [16]. From the description above, the natural cave destination (**ngalau**) as edupark has the potential to be used in science learning, and a learning media that supports the learning process using a scientific approach to be developed.

4. **Conclusion**

Based on the results of students' initial analysis, graduate competency analysis, assessment analysis, interviews with the science teachers and students about the learning process is carried out, and the analysis of science concepts on geopark, it can be concluded that it was necessary to involve geopark in the learning process. Thus, the development of learning resources will include the development of learning media based on edupark science so that the learning process can involve regional potential under the 2013 curriculum guidelines.

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