PAPER • OPEN ACCESS

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

To cite this article: K Ummah and Hamdi Rifai 2020 J. Phys.: Conf. Ser. 1481 012065

View the <u>article online</u> for updates and enhancements.

You may also like

- <u>Who gets the benefits of geopark</u> <u>establishment?</u> A study of Batur Geopark <u>Area, Bali Province, Indonesia</u> S Sagala, A Rosyidie, M A Sasongko et al.
- <u>Validity of science edupark e-book based</u> on scientific approach on the national geopark of *ranah minang silokek*, <u>Indonesia</u>
 Khairul Ummah and Hamdi Rifai
- <u>Environmental Values and Tourism</u> Perceptions at New Local Geopark Caota Sand Dunes, Taoyuan, Taiwan V v Onselen and T Y Lin





DISCOVER how sustainability intersects with electrochemistry & solid state science research



This content was downloaded from IP address 18.117.142.248 on 06/05/2024 at 15:02

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

K Ummah and Hamdi Rifai^{*}

Department of Physics, Faculty of Mathematics and Natural Sciences, Universitas Negeri Padang, Jalan Prof Dr. Hamka, Padang, 25131, Indonesia

*rifai.hamdi@gmail.com

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,

Content from this work may be used under the terms of the Creative Commons Attribution 3.0 licence. Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI. Published under licence by IOP Publishing Ltd 1

The 2nd International Conference on Research and Learning of Physics

Journal of Physics: Conference Series

065 doi:10.1088/1742-6596/1481/1/012065

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 MuaroSijunjung. The National Geopark of *Ranah Minang* Silokek of Sijunjung is located in a geographical position of 0037'23.75" South Latitude, up to 101000'14.07" 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.

120°0'0"E INDONESIA geopark silokel C Geopark 120°0'0" 130°0'0'E Silokek Legend SymbolID 0 solok selatan tanah datar kab sijunjung sawahlunto Pasaman adm adm50kota padang pariaman Padang adm kab solok Danau RA BARAT Skala 1:500.000 agam h 101'00'E 40 Miles 0 2.5 5 20 25 30 10 15 35

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)
- The sunshine (Lightwaves) 2.
- Human eyes (Optical AIDS) 3.
- Human ears 4.
 - (Vibration/resonance)

Figure 2. The Natural Cave forms and link on scientific concept at The National Geopark of Ranah Minang Silokek of Sijunjung.

2. 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. C	Duestionnaires	Scores of	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]:

$$V = \frac{X}{Y} x 100\% \tag{1}$$

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

3. 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.

Number	Acreat	(%) Result	
Number	Aspect	Yes	No
1.	Completeness of Learning tool	100	0
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

Table 3. Analysis of Teacher's Performance Aspect

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 nonprint 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:

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 <i>edupark</i> (educational park) in science	50.0	Not Bad
	learning.		
5.	The application of science learning with edupark	38.0	Bad
	(educational park).		

Table 4. The Teacher Analysis on Learning Process Aspect

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 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.

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

Table 5. Analysis of Students' Aspect

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 studentpsychomotor have not honed 54,39% (not bad). This low percentage is inseparable from the integration of *Edupark* in learning. Then, the student initial ability scoreis 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.

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

Table 6. The Concept on Science or	The National Geopark of R	anah Minang Silokek of Siju	injung
------------------------------------	---------------------------	-----------------------------	--------

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.

Acknowledgement

Thank you to science teacher of SMP IT Kautsar Ilmi Sijunjung, Mrs. Elva Rahmayani, S.Pd and all of the students who were helping researchers in filling out questionnaires and interviews.

Journal of Physics: Conference Series

012065 doi:10.1088/1742-6596/1481/1/012065

References

- [1] Kemendikbud, Permendikbud No. 79 tahun 2014 pasal 2 tentang Kerangka Dasar dan Struktur Kurikulum SMA/MA. .
- [2] A. Blanchard 2001 Contextual Teaching and Learning. B.E.S.T.
- [3] U. Samatowa, 2010 Pembelajaran IPA di Sekolah Dasar (Jakarta: PT Indeks)
- [4] I. Badawi 2015 Efektivitas Penggunaan Modul Berbasis Lingkungan Terhadap Hasil Belajar Peserta Didik Kelas VII SMP Negeri 28 Bulukumba J. Pendidik. Fis., vol. 3
- [5] Kemendikbud 2017 *Ilmu Pengetahuan Alam SMP / MTs Kelas VIII Semester 2.* (Jakarta : kemendikbud)
- [6] V. Widia et al 2016 Pengeruh Metode Karya Wisata Terhadap Hasil Belajar Siswa Tentang Ekonomi Masyarakat Sekitar *J. Pedadidaktika* vol. 3, hal. 117–128
- [7] D. P. Sari 2019 Analisis awal alat pembelajaran cairan edupark di taman air Mifan di kota Padang Panjang *J. Fis. IOP*
- [8] Plomp, *et al*, *Pengantar Reseraarch Desain Pendidikan*. Slo Lembaga Pengembangan Kurikulum Netherlands, 2010.
- [9] Riduwan 2010 Pengantar Statistika Untuk Penelitian: Pendidikan, Sosial, Komunikasi, Ekonomi, dan Bisnis (Bandung: Alfabeta)
- [10] K. Aprilia et al 2013 Teknik Penyusunan Skala Likert (Universitas Diponegoro)
- [11] Dopo *et al* 2016 Persepsi guru tentang digital natives, sumber belajar digital dan motivasi memanfaatkan belajar digital. *Jurnal Inovasi Teknologi Pendidikan* hal. 13–24
- [12] Kemendikbud, *Permendikbud No. 22 tahun 2016 tentang Standar Proses Pendidikan Dasar dan Menengah* (Jakarta : Kemendikbud)
- [13] A. Qadir Shaleh 2010 *Metode Pembelajaran dan Pengajaran*. (Yogyakarta: Ar-Ruzz Media)
- [14] P. U. W. Agustin *et al* 2018 Pengembangan Modul Fisika Berbasis Potensi Lokal 'Batik Lumbung dan Tahu Tamanan untuk Siswa SMA di Kecamatan Tamanan Bondowoso (Materi Suhu dan Kalor) vol. 7, hal. 62–69,
- [15] C. Rose, *et al*, 2002 Accelerated Learning for the 21 st Century. (Bandung: Yayasan Nuansa Cendekia)
- [16] H. Rifai et al, 2014 Pengintegrasian Karakter Hemat Energi ke dalam Materi Fisika SMA Menggunakan Concept Fitting Technique Proc. Seminar Nasional dan Rapat Tahunan Bidang MIPA 2014, FMIPA ITB, hal. 269–276