

PAPER • OPEN ACCESS

Preliminary analysis learning media in the form of interactive multimedia based on edupark physics Carocok beach Painan Indonesia with the scientific method

To cite this article: N Rahmadhani and H Rifai 2020 *J. Phys.: Conf. Ser.* **1481** 012087

View the [article online](#) for updates and enhancements.

You may also like

- [Validity of science edupark e-book based on scientific approach on the national geopark of ranah minang silokek, Indonesia](#)
Khairul Ummah and Hamdi Rifai
- [Development of interactive multimedia for learning physics based on traditional games](#)
K. Wiyono, I. Ismet and S. Saparini
- [Learning model based on discovery learning equipped with interactive multimedia teaching materials assisted by games to improve critical thinking skills of high school students](#)
Festiyed, D Djamas and R Ramli



DISCOVER
how sustainability
intersects with
electrochemistry & solid
state science research

Preliminary analysis learning media in the form of interactive multimedia based on edupark physics Carocok beach Painan Indonesia with the scientific method

N Rahmadhani and H Rifai*

Department of Physics Faculty of Mathematics and Natural Science, Universitas Negeri Padang, Jl. Prof Hamka, Padang 25131, Indonesia

*rifai.hamdi@gmail.com

Abstract. The country's South Pesisir Districts is a million charms that have a variety of tourist destinations, which are very much visited by people from various regions in West Sumatra. Carocok Beach Painan is one of the tourist icons that has an extraordinary beautiful destination. It is unfortunate if many tourist attractions found in the concept of physics are only just visited and not used as a means of learning Physics. This research was an initial stage in the development model of Plomp. The purpose of this study was to use the physics concept based on Carocok Beach Painan. The data in this study were obtained from interviews and questionnaires, that were developed based on the parameters of the learning process, learning tools, characteristics of students and region. The trend of educators was used students worksheets as well as the high interest of students to use IT based learning in the school. It was necessary to develop instructional media, in the form of interactive multimedia using Scientific Methods that can be associated with Carocok Beach Painan Edupark, which have a variety of physics concepts especially in the material-wave.

1. Introduction

The natural science is essentially a science that studies symptoms through a series of scientific processes that are built on the basis of scientific attitudes and the results are realized as scientific products composed of three components in the form of universally valid concepts, principles and theories [1]. As a procedure, it is intended as a methodology or method used to find out something common called the scientific method (scientific method).

Science education should be designed to provide understanding and improve student learning achievement. In the learning process, educators are demanded not only as motivators and facilitators but also be able to transfer their knowledge by applying various strategies, approaches, learning methods, learning techniques and learning media [2]. To achieve science education that should be expected to be a vehicle for students to learn about themselves and the environment. The learning process places more emphasis on providing direct experience to develop basic competencies in order to explore and understand the natural environment scientifically [3].

Today, when science and technology develops very rapidly, students can learn where, when and whatever, according to the interests and learning styles of students [4]. In these conditions, educators no longer act as the only source of learning, but act as learning designers [5]. A learning designer especially in physics learning is required to be able to design learning by utilizing various types of media and



Content from this work may be used under the terms of the [Creative Commons Attribution 3.0 licence](https://creativecommons.org/licenses/by/3.0/). Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.

learning resources that are appropriate so that the learning process takes place effectively and efficiently and learners gain learning experiences, because learning is essentially a process of behavior change thanks to experience [6].

Learning experiences can be obtained through Edupark facilities. Edupark is an educational park that is able to create learning values for the target of education (students) through the use of various rides contained in the edupark [7]. So, in the study an analysis of the learning process of Physics in MAN 2 Pesisir Selatan was conducted and the potential of edupark and Physics subject matter contained in CarocokPainan Beach tourist attractions that can be applied as learning media.

Pesisir Selatan Regency, West Sumatra has many tourist destinations that have a million charms, one of them is CarocokPainan Beach. This tourism place is in District IV Jurai which is about 2 KM from Painan City.

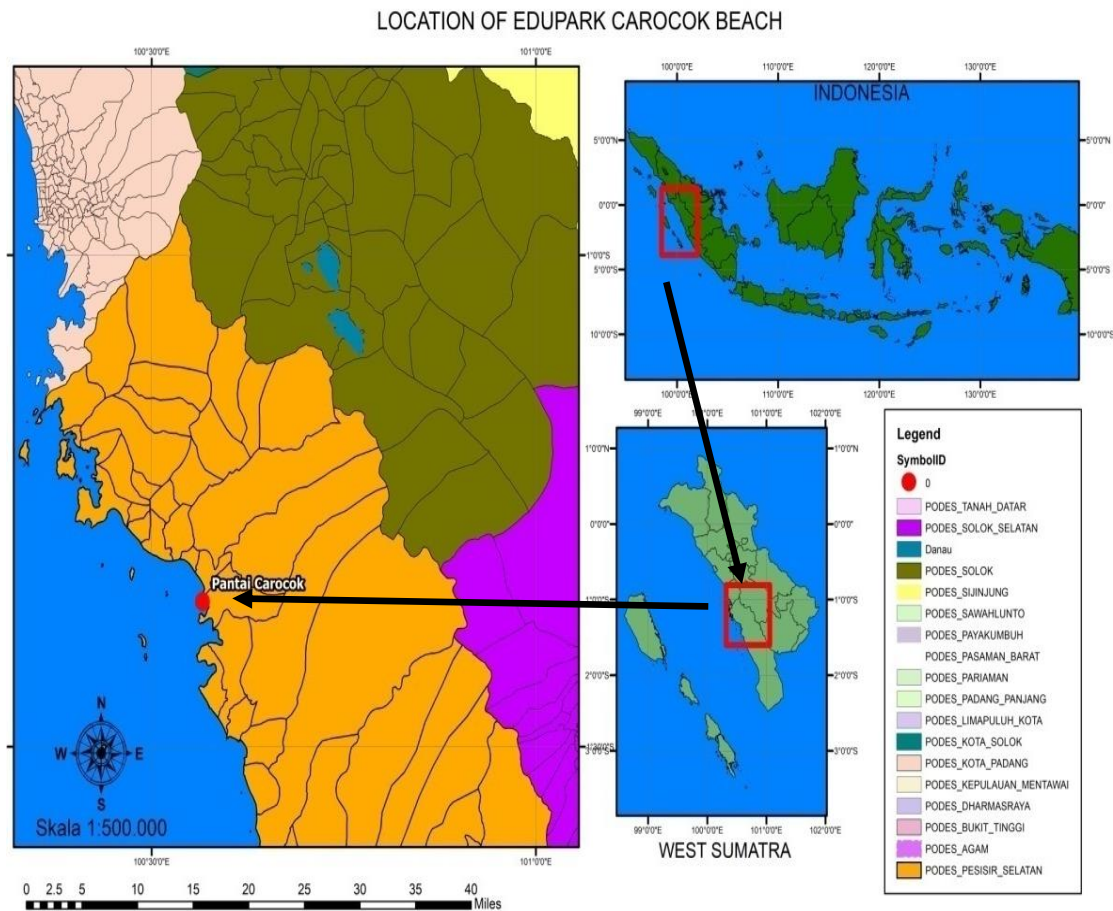


Figure 1: Carocok Painan Layout Information Map

The tourist location of Carocok Painan Beach is also very close to the peak tour of Langkawi, which offers beautiful views. Carocok Painan Beach can be reached by land by using public transportation or private transportation. This tourist attraction is around 75 KM or 2 hours drive. Another alternative to Carocok Beach is to use the sea route, by boarding a speedboat through Teluk Bayur port or from Muaro Padang Harbor.

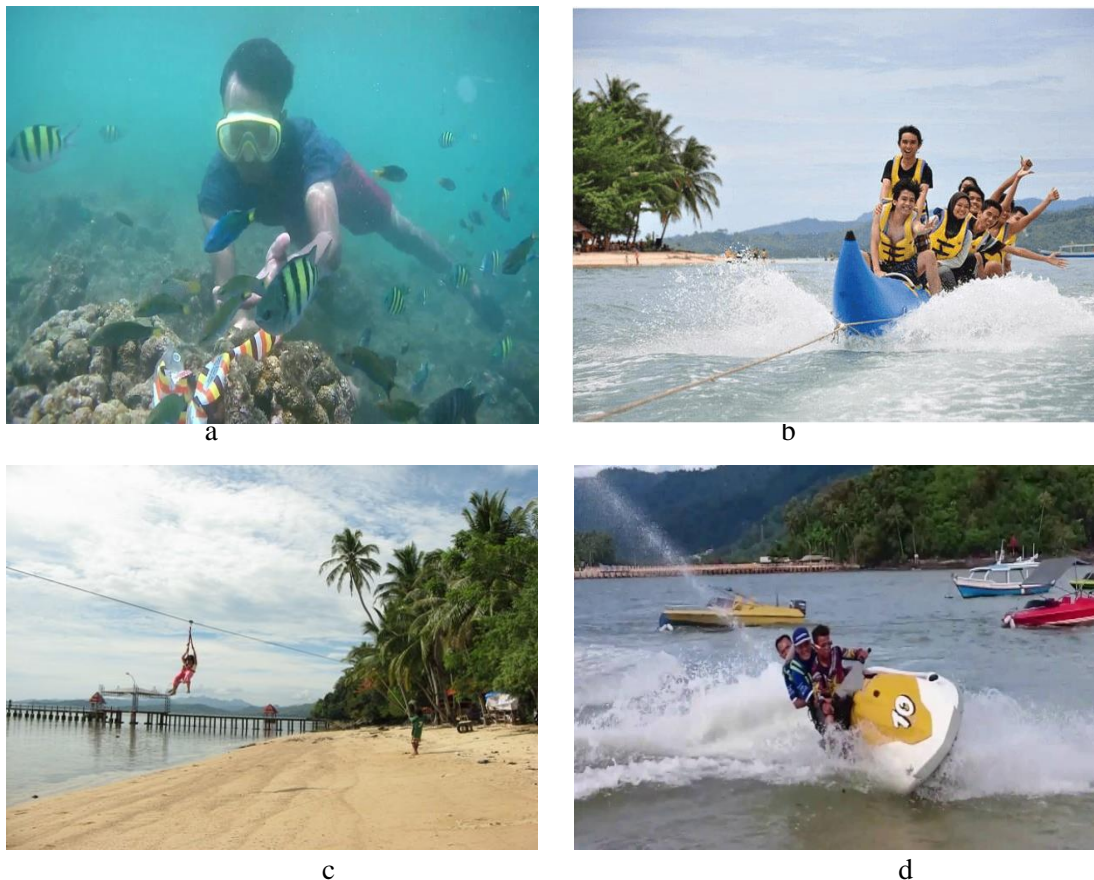


Figure 2. Rides on Carocok Painan Beach (a) Snorkeling (b) Banana boat (c) Flying fox (d) Jet skiing

Carocok Painan Beach presents various rides that contain various physics concepts. They are wave material, rope tension, dynamic fluid, hydrostatic pressure and effort and energy. So that, it can not only be used for recreation but also can be used as a medium for physics learning.

EduPark Carocok Painan Beach not only can be used as a means of supporting learning there are also other edupark such as Janjang Seribu [7], Mifan Padang Panjang [8], Ngarai Sianok [9], school park [10], Arau Valley [11], Hot Water Semurup [12].

2. Research Methods

The research method used is the research and development (Research and Development), with the development model of Plomp [13]. Plomp's development model consists of three phases, namely 1) preliminary research (preliminary stage), 2) prototype phase (design phase), and 3) assessment phase (assessment phase). This development model directs research to work systematically so that it can solve the problem under study. This research is only in the Preliminary Investigation stage, namely the stage of collecting and analyzing information, defining problems and continuing plans for the project [14].

The study was conducted in Painan, South Coastal District, West Sumatra. The research was conducted at Salido State Islamic Senior High School, Pesisir Selatan Regency, and one of the tourist attractions in Painan, namely the tourist spot is Carocok Painan Beach.

The data analysis technique used is descriptive quantitative and qualitative statistical analysis techniques. Quantitative descriptive technique by calculating the percentage of the number of suspension answers based on scoring of each answer from the respondents, with the formula [15] :

$$V = \frac{X}{Y} \times 100\% \quad (2.1)$$

Notes :

V = Final Value

X = Score obtained

Y = Maximum score

The percentages obtained quantitatively are then categorized qualitatively as in Table 1:

Table 1. Percentage of category distribution	
Percentage	Category
76-100	Good
51-75	Enough
26-50	poor
0-25	bad

Data collection techniques are carried out by observation, interviews, analysis of learning tools and material analysis. Observation is the systematic recording of circumstances, events and objects observed in the object of research [14]. The interview was conducted with Physics educators in the Aliyah Salido Madrasah, aiming to get an overview of the educator's procedures explaining learning to students and an overview of the learning process that took place. Analysis of learning devices is done by analyzing learning devices used by educators and students in the learning process. Observations are carried out directly into the field (Panatai Carocok). Analyzing objects related to concepts in Physics learning material.

Based on the results of the interviews used to find out the problems faced by educators in learning, and the results of the analysis of learning devices used to determine the effectiveness of learning devices, especially the media used in the learning process. The results of the observation and analysis of this material are used to determine the potential of nature (Carocok Beach tourist attractions) associated with Physics learning material.

3. Results and Discussion

3.1. Interviews were conducted with science educators and teaching material analysis

Interviews with MAN 2 Pesisir Selatan educators were conducted on June 14, 2019. Based on the analysis of the results of interviews that had been done and the problems experienced by educators in learning were almost the same, as shown in table 2.

Table 2. Analysis of interview results

No	Questions	Answer
1	Completeness that educators use before the learning process takes place	a. RPP is suitable with the KD that will be taught b. Teaching materials that suit the needs of students and material
2	The use of varied learning models and methods in learning	The teacher has begun to use several models and methods that are recommended in the implementation of the 2013 curriculum, but most of them use the same model namely PBL, PJBL and Discovery Learning.
3	Sources of learning used	Textbooks published by the government. Student Sheet ordered from a publisher.

4	Learning media used	The use of learning media is still very poor, even it is used, it is only in the form of Power Point.
5	Educators visit edupark (tourist attraction) with students in the physics learning process	It is very rarely to do, it can even be said as never, even though it might be done in the learning process.
6	Learning material is directly related to the circumstances and surroundings of the environment in the daily lives of students.	There is a part of the material, some even observe it directly. But that is in practical activities in school laboratories.
7	Learners can apply physics learning with edupark (tourism object)	It is very less to do, because it is influenced by the learning process that is only done in the school environment.

Based on table 2, it was concluded that the learning resources used were still in the form of student sheet and textbooks published by the government. The learning media used are still very poor, only in the form of Power Point. The learning process only occurs within the school environment and has not utilized the wealth of the existing area, so that students are less able to apply physics learning to the existing regional wealth.

3.2. Results of material analysis and field observation

The distance from schools to tourism locations is ranging from 2 to 3.5 km. These tourism attractions are often visited by most students. Science lesson materials that can be directly related to the condition of Carocok Beach are:

Tabel 3. Analysis of material and natural conditions related to the material

No	Rides Available	Science concept	Indicators of Achievement
1	Banana Boat	a. Rope tension b. Sentripetal style c. Archimedes' Law d. Dynamic fluid e. Wave	a. Determine the value of the rope tension b. Determine the elevation angle of the banana boat track c. Determine the value of buoyant force d. Determine the amount of discharge and speed of sea water
2	Snorkeling	a. Hydrostatic pressure b. Optics c. Light d. Buoyancy Style	a. Determine the amount of pressure that occurs in liquid b. Describes the refraction process of light in liquids c. Explain the process of vision in liquids d. Determine the value of buoyant force
	Flying Fox	a. Rope tension b. Newton's Law c. Elasticity	a. Determine the value of rope tension b. Describe the relationship between mass and the force given c. Determine the value of the elasticity of the material used
	Jet Skiing	a. Newton's Law b. Sentripetal style c. Push Style d. Momentum e. Wave	a. Explain the relationship between masses and the force given b. Determine the elevation angle traveled by the jet ski Determine the amount of momentum that occurs between jet skis and sea water

Based on table 3, it appears that a lot of subject matter can be directly linked to physics subject matter. This can give a picture to students that many events in daily life related to physics they learn at school. Based on the results of observations and analysis of this material, it is known that there are many subjects of physics that can be connected directly with the conditions contained in the tourist attractions of Carocok Painan Beach. This can be used as a learning resource and is used as an object to develop a media based on nature.

4. Conclusion

Physics learning in MAN 2 Pesisir Selatan Regency is in accordance with 2013 curriculum standards and demands. Learning is not only centered on educators. The learning method used in learning has also been aligned with that recommended by the 2013 curriculum that uses scientific methods. The students are also very follow the development of technology, but the integration of students related to the subject matter being studied with the surrounding environment is still lacking. The learning media used are also still less varied. There are a lot of physics subject materials that can be directly related to the circumstances and events contained in Carocok Painan Beach. Responding to the problems contained in the results of the interview analysis, analysis of learning tools, material analysis and the potential of the area in Carocok Paiana Beach, an edupark-based learning media that is designed according to the 2013 curriculum and integrated with scientific methods at Carocok Painan Beach.

Acknowledgments

Acknowledgments is given to physics educators at MAN 2 Pesisir Selatan, South Coastal District, as the source of the interview, analyzed the learning tools carried out in this study. Then, it is also given to the local Tourism Office has facilitated researchers to observe the Carocok Painan Beach.

References

- [1] Trianto 2014 *Model Pembelajaran Terpadu* (Jakarta: Bumi Aksara)
- [2] Al-Tabany T I B 2014 *Mendesain Model Pembelajaran Inovatif, Progresif, dan Kontekstual*. (Prenadamedia Group.)
- [3] Samatowa U 2010 *Pembelajaran IPA Di Sekolah Dasar* (Jakarta: Indeks)
- [4] Gunawan, Harjono A, Sahidu H, and Sutrio *Penggunaan multimedia interaktif dalam pembelajaran fisika dan implikasinya pada penguasaan konsep mahasiswa vol. IX*.
- [5] Baharuddin dan Wahyuni E N 2015 *Teori Belajar dan Pembelajaran*. (Ar-Ruzz Media)
- [6] Pariartha G M A, Parmiti D P and Sudatha G W 2013 *Pengembangan Media Pembelajaran Berbasis Multimedia interaktif pada mata pembelajaran IPA untuk siswa kelas VIII semester 1 di SMP Negeri 3 Sisingaraja Tahun pelajaran 2012/2013*
- [7] Gusweri G dan Rifai H Preliminary analysis based instructional materials edupark learning natural sciences method of travel work in Janjang Seribu and Merah Putih Mountain Sulit Air *J. Phys. Conf. Ser.*, **vol. 1185**, 2019.
- [8] Sari D P dan Rifai H 2018 Preliminary Analysis Of Edupark Fluid Learning Tool In Mifan Water Park In Padang Panjang City *J. Phys. Conf. Ser.*, hal. 1–8
- [9] Efmafri W and Rifai H Ngarai Sianok as Physics Education's Edupark *J. Phys. Conf. Ser.*, 2018.
- [10] Afrinaldi dan Rifai H 2019 Evaluation of garden functions of SMAN 2 Lubuk Basung as science-based education park *J. Phys. Conf. Ser.*, **vol. 1185**, hal. 12126
- [11] Yulia and Rifai H 2018 Preliminary study of edupark energy in geopark Harau Lima Puluh Kota Regency," *J. Phys. Conf. Ser*
- [12] Anggara V J and Rifai H The preliminary analysis of Edupark learning devices of temperature and heat physics of Air Panas Semurup Kerinci District *J. Phys. Conf. Ser.*,

- [13] Tjeerd P and Nieveen N 2010 *Pengantar Research Desain Pendidikan.Slo Lembaga Pengembangan Kurikulum* (Netherlands)
- [14] Tjeerd P and Nieveen N 2010 *An Introduction to Educational Design Reseraarch.Slo* (Netherlands Institute for Curriculum Development)
- [15] Riduwan and Sunarto H 2010 *Pengantar Statistik*. (Bandung: Alfabeta)
- [16] J. Sarwono 2006 *Metode Penelitian Kuantitatif & Kualitatif* (Yogyakarta: Ghara Ilmu)