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Edutourism Taka Bonerate National Park through Scientific Approach to Improve Student Learning Outcomes

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Abstract. This research aim is develop the potential of Taka Bonerate National Park as learning resources through edutourism with scientific approach to improve student learning outcomes. Focus of student learning outcomes are students psychomotor abilities and comprehension on Biodiversity of Marine Biota, Corals Ecosystem, and Conservation topics. The edutourism development products are teacher manual, edutourism worksheet, material booklet, guide's manual, and Taka Bonerate National Park governor manual. The method to develop edutourism products is ADDIE research and development model that consist of analysis, design, development and production, implementation, and evaluation step. The subjects in the implementation step were given a pretest and posttest and observation sheet to see the effect of edutourism Taka Bonerate National Park through scientific approach to student learning outcomes on Biodiversity of Marine Biota, Corals Ecosystem, and Conservation topics. The data were analyzed qualitative descriptively. The research result is edutourism Taka Bonerate National Park through scientific approach can improve students learning outcomes on Biodiversity of Marine Biota, Corals Ecosystem, and Conservation topics. Edutourism Taka Bonerate National Park can be an alternative of learning method on Biodiversity of Marine Biota, Corals Ecosystem, and Conservation topics.

1. INTRODUCTION

Local potential of tourism can be used as a learning resource through edutourism activities. Tourism should have function to fulfill the needs of the physical, spiritual, and intellectual every tourist (ConstitutionNumber 10 Year 2009 about Tourism). Facts show that the tourist areas have not been optimally utilized as an educational media, many tourists who visit just for refreshing only. Local potential attractions have the potential to be developed as a source of biology learning. This is possible because of the availability of the biology study object in tourism location. Each region requires education in accordance with the characteristics of the region, so the curriculum should contain that diversity to produce graduates that are relevant to the region development needs (BSNP, 2006: 7). Learning through the student'senvironmentis better to develop a balance hard skill and soft skills of students, because students intersect and interact directly with the environment as an object of study (Darsiharjo, 2010). Therefore, in learning biology teachers should include local potential as a learning resource.

In the education and tourism field, we know the term edutourism can be a solution in using local potential of tourism as a source of learning. Edutourism in the 1st Annual International Conference on

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Sustainable Edutourism interpreted as a journey that aims to learn formally or informally, in a tourism environment that has a local unique. Edutourism can be used as one solution the use of local potential as a learning resource for biology learning.

Taka Bonerate National Park is one of the attractions located in Selayar, South Sulawesi. Taka Bonerateis a nature conservation area which is geographically located in the Flores Sea, an area is 220,000 ha, and this area is the third largest coral atoll in the world, after Atoll Kwajifein in the Marshall Islands and Atoll Suvadiva in Maldive (Effendi, 2011: 15). Taka Bonerate has high diversity of marine biota and habitat for many species of marine animals that are endangered and protected. Therefore, it's very appropriate if these attractions packed into a learning resource on Diversity of Marine Biota, Coral Reef Ecosystem, and Marine Biota Conservation topics for student tourists through edutourism.

During this time Taka Bonerate formally untapped as a source of learning for student tourist. There are no media to supports biology learning activities to student tourist. Edutourism development research is aimed to increase students learning outcomes. It is need attractions mapping of the local potential as biology learning resource and make edutourism products in form of teacher manual, edutourism worksheet, material booklet, guide manual, and Taka Bonerate National Park governor manual. After the implementation stage of edutourism with scientific approach using the edutourism product, edutourism can improve psychomotor and cognitive of SMA N Taka Bonerate students on Biodiversity of Marine Biota, Reef Ecosystem, and Conservation topics.

2. METHOD

This is a research and development (R & D) with ADDIE development model. ADDIE consist of five steps, there are Analysis, Design, Development and Production, Implementation, Evaluation. It was adapted from Dick and Carey model (Dick, Carey, Carey, 2005: 6-8). Analysis stage consist of learning objects identification, student'sneed analysis, curriculum analysis, and instructionalanalysis. Design stage consist of develop learning objectives, framework (outline) of edutourism development product, and design evaluation tools. Development and productionstageconsist of developedinstrument to assess edutourism, develop learning strategy, materials selection, writing draft of edutourism development product, draft review, draft assess, and firstrevision. Implementation stage is trial for edutourism development product.Implementation subject are students from SMA Taka Bonerate who school location adjacent to Taka Bonerate National Park and previously they never visit to Taka Bonerate National Park. Implementation of development products are quasi use Pretest Posttest Group Design, where students were tested before and after edutourism implementation.

Table 1. Research Design, Pretest Posttest Group Design

Table 1. Research Design,	Pretest Posttest	Group Design
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Group	Pre-Test	Treatment	Post-Test	
Treatment Class	0	Х	0	

Note:

X=*Edutourism* Taka Bonerate National Park

O=Student ability before and after edutourism implementation

Measuring gain score conducted to understand whether edutourismthrough scientific approach can improvestudent's cognitive learning outcomes in Marine Biota Diversity, Coral Reef Ecosystem, and Marine Biota Conservation topics:

Table 2.Criteria Improving Learning Outcomes of Gain Score			
Category	Gain Score (g)		
High	$g \ge 0,7$		
Medium	$0,7 > g \ge 0,3$		
Low	g < 0,3		
(Hake, 1998; 64-74)			

After edutourism product implemented, the inplementation result is used to do second revision. The las step is evaluation stage wheresummative evaluation conducted to determine the usefulness of the product and make recommendations on further product development.

3. RESULT AND DISCUSSION

3.1. Taka Bonerate National Park Potential as Learning Resources

Taka Bonerate National Park has many potential as learning resources, it can be developed edutourism concept. Tourist, especially students tourist can study in Taka Bonerate National Park. Potential analysis conducted to find learning object and decide edutourism activity in Taka Bonerate National Park.

 Table 3. Learning Objects and Edutourism Activity in Taka Bonerate National Park

Learning Objects	Edutourism Activity	Learning Post
Marine Biota Diversity	1 st Learning Activity: Observe and Identify Marine Biota Diversity by diving or snorkeling	Tinabo Island: Baby Shark Spot, Ibel Orange Spot, Softcoral Points, Acropora Points, Corina Corner, Seagrass Spot, Kima Spot
Corals Diversity	2 nd Learning Activity: Observe and Identify Corals Diversity by diving or snorkeling	Tinabo Island: Ibel Orange Spot, Softcoral Points, Acropora Points, Corina Corner
Coral Reef Ecosystem	3 rd Learning Activity: Identify components of coral reef ecosystems and their interactions	Tinabo Island: Ibel Orange Spot, Softcoral Points, Acropora Points, Corina Corner
Conservation Efforts in Taka Bonerate National Park	4 th Learning Activity: Case Study of Marine Biota Conservation	Tinabo Island: Coral Transplantation Spot, Acropora Points, Corina Corner, Kima Spot

Edutourism is an integration of education into tourism, tourist refresh but do not forget to study about what they observe in tourist area. Here are edutourism activities that can be offered as a package holiday for students:

Table 4 EdutourismPackage	in	Taka	Bonerate	Island
1 able 4. Euulourisini ackage	111	т ака	Donerate	Island

Edutourism package "Marine Biota"					
Learning Post	Learning Aspects (Education)		Refreshing Aspects (Tourism)		
a. Baby Shark Spot b. Corina Corner c. Seagrass Spot d. Kima Spot	 Observediversity of marine biota Studydiversity of marine biota Study the importance of marine biota diversity Study many cases of marine biota conservation in Taka Bonerate National Park Study how to conserve the diversity of marine biota 	a. b. c. d. e. f.	Diving Snorkeling Photography below sea level Canoeing Boating Swimming with baby shark		
Edutourism package "Coral Reef"					

	Educourisiii puchage Cortai Reer	
Learning Post	Learning Aspects	Refreshing Aspects
	(Education)	(Tourism)

a. Ibel Orange Spot	a. h	Observe the diversity of corals	a. h	Diving
c. Acropora Points	D.	and their interactions	b. с.	Photography below sea
d. Other Corals Spot	c.	Study the importance of coral reef ecosystem		level
	d.	Study how to conserve coral reef ecosystem	d.	Boating
	с.	Flactice Colar Halisplantation		

3.2. Curriculum Analysis Result

Curriculum analysis conducted to make competencies mapping that will be delivered by edutourism activities in Taka Bonerate National Park. Basic competencies (KD) was developed from core competencies (KI)National Curriculum Year 2013. Below are the basic competencies:

- 1.1 Admire the order and complexity of God's creation on biodiversity, ecosystems and the environment
- 1.2 Be aware and admire the scientific thinking in observing capabilities bioprocess
- 1.3 Be sensitive and concerned about environmental issues, maintaining and caring for the environment as a manifestation of the practice of their religion
- 2.1 Conduct scientifically: conscientious, diligent, honest to the data and facts, discipline, responsibility, and care in observation and experimentation, daring and polite in asking questions and arguing, environmental care, mutual aid, cooperation, love peace, argues the scientific and critical, responsive and proactive in every action and in conducting observations and experiments in the classroom/laboratory and outside the classroom/ laboratory
- 2.2 Concerned for the safety of themselves and the environment by applying the principle of safety when conducting observations and experiments in the laboratory and in the neighborhood
- 3.5 Applying the principles of classification to classify protist based on common characteristics of the class and its role in life through thorough and systematic observation.
- 3.8 Applying the principles of classification to classify animalia into phyla based on observation of anatomy and morphology and associates their role in life.
- 3.9 Analyze information/data from various sources about the ecosystem and all the interactions that take place therein.
- 3.10 Analyzing the data changes in the environment and impact on the lives
- 4.5 Plan and carry out observations about the characteristics and role of protist in life and present the results of observations in the form of model/chart/ image.
- 4.8 Presenting data on the comparison of network complexity constituent bodies of animals and its role in various aspects of life in the form of a written report.
- 4.9 Designing a chart of the interaction between the components of the ecosystem and food networking that takes place in the ecosystem and presenting the results in various forms of media.
- 4.10 Solving environmental problems by making environmental conservation efforts.

3.3 Edutourism Development Product

Learning objects that potential to be studied by students tourist in Taka Bonerate then developed into instructional organization that consist of teacher manual, edutourism worksheet, Booklet Material, *guide's* manual, and Taka Bonerate National Park governor manual.

1. Teacher Manual

Teacher manual consist of three parts, Part I. Introduction of EdutourismTakaBonerate National Park, Part II. Edutourism Activities with Scientific Approach, and Part III.Edutourism Learning Equipment consists of syllabus and lesson plan

2. Edutourism Worksheet

Worksheet consists of four learning activities, 1st Learning Activity: Marine Biota Diversity, 2nd Learning Activity: Understand Coral Reef, 3rd Learning Activity: Coral Reef Ecosystem, 4thLearning Activity: Marine

Biota Conservation. Before learning activities, students introduced work safety to have activities in the sea. After learning activities, students evaluated with assess instruments that included in edutourism worksheet.

3. Booklet Material

Booklet material consists of three topics, namely: Diversity of Marine Biota, Coral Reef Ecosystem and Marine Biota Conservation. Each topic begins with an explanation of learning objectives and ends with "Do You Know?".In the end of the booklet therea are given conclusion and glossary

4. Guide's Manual

Guide's manual consists of two parts. First part, guide are introduced about the potential of Taka Bonerate National Park for edutourism development. Second part, guide can study how to guide edutourism activity in Taka Bonerate National Park.

f. Taka Bonerate National Park Governor Manual

Governor manual consist of two parts. First parts, governor of Taka Bonerate National Park are introduced about the potential of Taka Bonerate National Park for edutourism development. Second part, governor can study edutourism activity in Taka Bonerate National Park.

3.3 Edutourism Implementation Result

Edutourism products that have been developed were implemented on students of SMAN Taka Bonerate. Each student does activities based on worksheet and learns the material from bookletmaterial. Edutourism activities conducted with scientific approach and cover three topics; there are Marine Biota Diversity, Coral Reef Ecosystems, and Marine Biota Conservation. Stages of edutourismwith scientific approach are observing, questioning, associating, experimenting, and networking. Each stage of learning in edutourism still included fun or refreshing activity. Students learning outcomes focus on cognitive and psychomotor. Cognitive learning outcomes measured by providing pretest posttest to students, while psychomotor learning outcomes observed with the observation sheet. Edutourism implementation results prove that there is an increase in students' cognitive learning outcomes. The results of the pretest posttest can be seen from Figure 1. Calculation of gain score was also conducted to determine whether there is an increase in the ability of students between before to after learning through edutourism. The average gain score of students increase cognitive learning outcomes after Edutourism Taka Bonerate National Park with scientific approach. The percentage gain score of students can be seen from Figure 2.



The analysis results of observation sheets explain that learning through Edutourism can encourage students psychomotor. Psychomotor learning outcomes associated with achievement through manipulation skills that involve muscle and physical strength. Psychomotor learning outcomes focus was on moving, manipulating, communicating, and creating ability. Psychomotor learning outcomes are a continuation of the cognitive and affective learning outcomes. The successful development of the cognitive aspects will positively affect the development of psychomotor aspects.Psychomotor learning outcomes that appear when students do EdutourismTaka Bonerate National Park:

- 1. The ability of moving, students always maximizes the use of muscles to move in a tourist sites to fullfill worksheet by observation or data collection. Students do snorkeling in almost Edutourism activity.
- 2. The ability of manipulating, students needs the coordination of body movements such as the eyes, ears, hands, and fingers to conduct data collection at tourist sites.
- 3. The ability of communicating, students always interact and communicate effectively with the guide, teacher, and surrounding communities in the tourist sites for data collection and problem solving.
- 4. The ability of creating, edutourism activities also forces students to think to make an idea of conservation, complete the edutourism worksheet, and make conservation poster. So from this edutourism activity students generate products.

4. CONCLUSION

Edutourism of Taka Bonerate National Park can improve the cognitive aspects of learning outcomes and encourage the emergence of psychomotor aspects. Therefore, Edutourism Taka Bonerate National Park can be used by teachers as an alternative method of learning on diversity of marine biota, coral reefs ecosystems, and marine biota conservation topics.

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