

THE EFFECT OF ENVIRONMENTAL LEARNING STRATEGY AND COMPREHENSION ABOUT PHYSIC OF WATER BODY ON PARTICIPATION OF BIOREGIONAL CONSERVATION

Sunaryo (naryounj@yahoo.co.id)

Magister Program, Population and Environmental Education, State University of Jakarta

Yossa Istiadi (yossaistiadi@pakuan.ac.id)

Magister Program, Environmental Management, Pakuan University

ABSTRACT

Objective of research are to find out the effect environmental learning strategy and comprehension about physic of water body. Experimental factorial by two levels was conducted to 80 students which collected with cluster random sampling technique. Experimental learning strategy were accomplished two type strategies such Field Trip and Classical learning. While for simple effect using higher and lower the comprehension about physic of water body. Result of this research that are (1) there is significantly different between effect of field trip and classical learning on participation of bioregional conservation ($F = 4,53$; $p < 0,01$); (2) Students with higher comprehension about physic of water body, there is significantly different between effect of field trip and classical learning on participation of bioregional conservation ($F = 4,37$; $p < 0,01$); (3) Students with lower comprehension about physic of water body, significantly different between effect of field trip and classical learning on participation of bioregional conservation ($F = 4,37$; $p < 0,01$); and (4) there is interaction between environmental learning strategy and comprehension about physic of water body on participation of bioregional conservation ($F = 5,89$; $p < 0,01$). Conclusion, to achieve participation of bioregional conservation with applied the environmental learning strategy will be taken attempts the comprehension about physic of water body.

Keywords: *Environmental Learning Strategy, participation of bioregional conservation, comprehension about physic of water body*

INTRODUCTION

Rivers are the most important freshwater resource for people. Social, economic and political development has, in the past, been largely related to the availability and distribution of fresh waters contained in riverine systems. Physically, diverse of the river consist in size, geometry, substrat, sediment type, stage development, and climate (Nature Conservancy, 2015). The dynamic system of the rivers that continually adjust to natural and human caused changes for industry, agriculture, and domestic use. Rivers ranked highest using these criteria can be considered 'high conservation aquatic ecosystems' and can subsequently be targeted for more in-depth analysis and prioritisation. These aquatic habitats of high conservation value should facilitate strategic policy

development aimed at conserving most valuable rivers (Stewart, Barbara, 2011). While management of erosion and flooding requires considerable effort and cost. The view of river perspective known as bioregional system, where a river as long from upper water flow to ocean affect to biodiversity.

Otherwise, some human caused for development have destructions to natural life by the political and administrative approaches. This mention leads to happens some disasters as the flood and landslide as long river flows. By looking at the flooded and landslide area, many household items which are victims and damaged. Somehow the policy in river management are separately by locals governments, therefore community have lower contributed to river conservation as part of bioregional perspective.

Involvement of community in bioregional perspective should begin from education. In formal school, environmental learning have not portion at regular curriculum. Kinds of study which learning about environment spreads into some courses in the school. In case of education learning, most teachers using teaching by conventional class by teacher center approach. While the problems of environment have happen in the surrounding areas. Aspect of the bioregion refers to Karina Barquet (2015) through a study of a transboundary protected area (TBPA) in Central America, reflected upon the process in which particular scalar constructs are produced and legitimized. Transboundary conservation is often promoted as a tool to adapt the geography of environmental problems to institutional and spatial levels of governance. In this respect, the concept of bioregion is used as an argument to respatialize governance schemes to a 'transboundary scale'.

Mention of above caused that students comprehension of environment have not able to their competency, mainly about physic of water body such as river, lake, or swamp ecosystems. Characteristic of river as part which closer with their life should be well known as learning achievement, therefore it will be contribute to participation of bioregional conservation. The participation following Chamber (2001) that an involvement of community to improve development with initiatives, contributes, and responsibility. In case of bioregional conservation, its participation tend to maintain biodiversity in the river flow areas. Comprehension about physic of water body refer from Bloom's cognitive taxonomy (1994) is students able to translate, interpretation, and generalisation about river characters. Environmental learning strategy is the effort of knowledge transfer by experience learning (Bruce, 2004). Theoretic of the Dale's cone experience that distinguished into fieldtrip and classical. Based on that, the research questions are following:

1. Does have difference the environmental learning strategy between fieldtrip and classical on participation of bioregional conservation?
2. Student with lower rank of comprehension about physic of water body, does have difference the environmental learning strategy between fieldtrip and classical on participation of bioregional conservation?
3. Student with higher rank of comprehension about physic of water body, does have difference the environmental learning strategy between fieldtrip and classical on participation of bioregional conservation?
4. Does have interaction between the environmental learning strategy and comprehension about physic of water body on participation of bioregional conservation?

METHODOLOGY

Participation on bioregional conservation is an involvement of initiative, contribute, and responsibility to maintain, preserve, and conserve the biodiversity based on as long river flow. To measure those build instrument which consist of contingency following are:

Instrumen use rating scale with score: 5 if choose Very agree, 4 if choose Agree, 3 if choose Ragu-ragu, 2 if choose Not agree, 1 if Very not agree. Validaty of instrumen use product moment pearson (ppm) and reliability with Alpha Cronbach.

Comprehension about physic of water body is competency of translating, interpretation, and generalization about quality of water, sediment, flow, and gradient of river (table 2). To measure those test instrument that consist of following are:

Instrumen use dichotome scale with score: 1 if true, and 0 if false. Validity of instrumen use point biseral (rpb) and reliability use Kuder-Richardson (KR-20).

Research was completed use the experimental design Factorial 2x2 to students with $n = 80$ who is take course of environmental education, from the Physic department of State University of Jakarta in July – August 2017. Research conducted to one group with fieldtrip method and one group with classical as group control.

Experiment procedures divide into two kind syntaxs of learning. *First*, class with treatment the fieldtrip strategy. Exploration phase, student got explained the map view about water flow of Ciliwung river from upper to estuarian and recognized about biodiversity and phisic character of river. Elaboration phase, students field observation to pisces spp and phisic of river in three type of ecosystem such as mountain area (Mega Mendung), Midle mountain area (Bogor), and lower area (Kalibata, Jakarta). Evaluation phase, knowledge testing about biodeversity and phisic of river. *Second*, class with conventional treatment by teacher centered approach. Teacher explained about biodiversity content with character of habitats, group discusion, end evaluation with the same testing with the fieldtrip’s group.

Data analysis used frequency distribution, test of normality and homogeneity, and Anova two way with F testing in statistical inferensial to hipothetical testing. Experimental design as following:

Fig.1. Experiment factorial design 2 x 2

Treatment		Environmental Learning Strategy (A)	
		Fieldtrip (A1)	Classical (A2)
Attribute			
Comprehe nsion of about phisic of water body (B)	Higher (B1)	A1B1	A2B1
	Lower (B2)	A1B2	A2B2

RESULT AND DISCUSSION

Based on experiment applied and data collection, there are two type instrumens, such as the rank level of comprehension of water body phisic and score of participation

of bioregional conservation. First analyse, effect between fielftrip and classical learning strategy on participation. Based on data collections it could be describe following hypotesis are (1) the effect of the learning strategy between fieldtrip and classical on participation of biodiversity conservation, Based on ANOVA, there are signifikan different ($F = 4,53; p < 0,05$). Hypotesis rejected H_0 , there are different of the learning strategy fieldtrip different with classical on the participation of bioregional conservation. It’s mean that the fieldtrip strategy have influence with classical learning strategy to achieve participation of biodiversity conservation.

When students visit to the field for the first time in case of learning, it can be overwhelming, so much to see and do. Those case same experience in learning of museum by Jennifer Tuffy (2011) better than learning in the classroom. Succesfully of fieldtrip academic determined in designed of the education program by teacher with learning sources remarkable (Bozdogan, 2012).

Second analyse (2) The effect of the learning strategy between fieldtrip and classical participation of bioregional conservation, in students who have higher the comprehension of body water phisic. Based on ANOVA there are different ($F = 4,37; p < 0,05$), Hypotesis could be rejected H_0 , there are different of the fieldtrip learning strategy in the students who have higher the comprehension of water body phisic. There are also found the same fact of third analyse that (3) The effect of the learning strategy between fieldtrip and classical on the participation of bioregional conservation, in the students who have lower the comprehension of water body phisic. Based on ANOVA there are different ($F = 4,37; p < 0,05$), Hypotesis could be rejected H_0 . This mention showed, that the comprehension have effect on the participation of bioregional conservation.

Fourth analyse 4) There are Interaction between the learning strategy and comprehension water body phisic on the participation of bioregional conservation. Based on ANOVA, that signifikan different ($F = 5,89; p < 0,05$), Hypotesis could be

rejected H_0 , there are interaction between the learning strategy with comprehension of water body physic on the participation of bioregional conservation (Table 3).

Table 3. Anova

Source of Varians	df	Sum of Square	Sum of Square Mean	F	Table	
					0.05	0.01
Among Group	3	1238.74	412.91	5.36	2.71	4.08
Within Group	76	5850.45	76.99			
Learning Strategy (A)	1	201.61	201.61	4.53*	3.97	7.01
Comprehension of water body (B)	1	78.01	78.01	4.37*		
A X B	1	959.11	959.11	5.89*		
Total	79	7089.19	89.74			

*) significant

CONCLUSION

Based on findings above, that to achievement on the participation of bioregional conservation, applied environmental learning strategy should be taken considering the comprehension about physic of water body. Fieldtrip strategy could be effective applied to student who have higher the comprehension about physic of water body, and classical strategy could be effective applied to student who have lower the comprehension about physic of water body.

ACKNOWLEDGEMENT

Research program regarding to the collaborative research between Magister Program of the Population and Environmental Education, State University of Jakarta with Pakuan University, Bogor.

REFERENCES

Anastasi, Anne., Psychology Testing., (New York: MacMillan Publishing Inc, 1986)

Barquet, Karina (2015), Building a bioregion through transboundary conservation in Central America, Norwegian Journal of Geography, Vol. 69, No. 5, 265–276

Barrow, C.J., Developing the environment problems and management. London: Longman, 1995

Bell, Paul A. et al., Environmental Psychology (Tokyo: Harcourt Brase College Publisher, 1996)

Borg WR, and Gall MD., Educational research, an introduction. 4 th ed. (New York: Longman, 1983)

Borrong, Robet P. 2000. *Etika Bumi Baru: Akses Etika dalam Pengelolaan Lingkungan Hidup*. Jakarta: BPK Gunung Mulia.

- Bozdoğan, Aykut Emre. (2012) , The Practice of Prospective Science Teachers Regarding the Planning of Education Based Trips: Evaluation of Six Different Field Trips, Copyright of Educational Sciences: Theory & Practice is the property of EDAM-Education Consultancy
- Campbell, J. B. Reece, L. G dan Mitchell. 2004. *Biologi*. Edisi Kelima. Jilid3. Jakarta: Penerbit Erlangga.
- Chang, William. 2009. *Bioetika Sebuah Pengantar*. Yogyakarta: Kanisius
- Cohen, Michael J. Eco-Sensory perception: The Eco Sensory Intelligence Test, Institute of Global Education, 2001, www.ecopsych.com
- Cunningham, William P. 2003. *Environmental Science*. A Global Concern 7th edition. McGrawhill Book Co., NewYork.
- Dunlap, R.E at al., New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm. A revised NEP scale. *Journal of Social Issues*: 56(3), h.436 (2000).
- Fernandes, H. J. X., Testing and measurement, (Jakarta: National Education Planning, Evaluation and Curriculum Development, 1984)
- Gleich M, Maxeiner D., et al., Life counts, cataloguing life on earth. (New York: Athlantic, 1993)
- Gronlund, Norman., Measuremet and evaluation in teaching (New York: MacMillan Publishing, 1985)
- Hopskins, Michael T, "The Effects of Computer-Based Expository and Discovery Methods of Instruction on Aural Recognition of Music Concepts, 2002, *Journal of Research in Music Education*, vol.50 Edisi 2.
- Maton Karl and Moore Roob."Social Realism, Knowledge and Sociology of Education", London:Continuum International Publisng Group,2010.
- McCallum Ian, Lyall Watson. 2008. *Ecological Intelligence, Rediscoveringourselves in nature*
- Nebel, B.J., Wright, R.T., *Environmental science*, 7th ed. (New Jersey: PrenticeHall, 2000)
- Okonski, Kendra., Deep ecology's faulty ethics. www.greenreligion.com/deepecology.html, 2000
- Ristyantoro, Rodemeus. 2003. Science Without Ethics Is Blind, EthicsWithout Science Is Empty. *ResponS*, Vol. 8, No. 01, Hal 49-58.
- Stanley. 2005. Local Perception of Public Goods; Recent assessments of willingness-to-pay for endangered species. *Contemporary Economic Policy* 23.
- Stewart, Barbara A. Assessing the ecological values of rivers: an application of a multi-criteria approach to rivers of the South Coast Region, Western Australia, *Biodivers Conserv* (2011) 20:3165–3188
- Swaak, Janine Ton de , Wouter." *The effect of Discovery Learning and Expository Instruction on acquisition of Definitional and Intuitive Knowledge*".*Journal of Computer Assited Learning* 20. Blackwell Publishing Ltd2004.
- Tuffy, Jennifer. The Learning Trip: Using the Museum Field Trip Experience as a Teaching Resource to Enhance Curriculum and Student Engagement, Submitted in Partial Fulfillment of the Requirements for the Degree Master of Science in Education School of Education and Counseling Psychology Dominican University of California San Rafael, CA May 2011
- Turk Jonathan& Turk Amos, *Environmental Science*. United State of Amerika: W.B Saunders Company, 1984.