Model of Environmental Education

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Abstract

The objective of this study is to promote a model of environmental education. The sample group in this survey study composed of to 1077 tourists in Jakarta, the capital city of Indonesia. In a questionnaire, the tourists were requested to provide samples of their satisfying natural curiosity of individuals, enhancing environmental awareness, and strengthening visitor's pro-conservation values and to detail how thesevariablespredicted environmental education. The data analysis used the structural equation model (SEM).Based on the statistical analyses, the most important finding of this research was that tourist satisfying natural curiosity of individuals, enhancing environmental awareness, and strengthening pro-conservation values, had predictive effects on environmental education. The tourist satisfying natural curiosity of individuals was described by knowledge improvement of the tourists about nature, positive attitude toward environment, skill improvement about environment, and environmental curiosity met.Enhancing environmental awareness was supported by awareness improvement of the tourists to take care the environments well, awareness improvement of the tourists not to destroy the environments, awareness improvement of the tourists not to use the environments excessively, and awareness improvement of the tourists to take care the cleanliness of the environments. Strengthening visitor's pro-conservation values was estimated by maintaining existing environmental values, responsibility of environmental management, managing environment suitable with regulation established, and using environment on the basis of conservation values.This study contributes practically by supplying a model for environmental education. Using this model, the tourist environmental education can be enhanced to preventenvironmental destruction. This study can offer the environmental sustainability through the model of environmental education.

Keywords: Environmental education; natural curiosity; environmental awareness; pro-conservation values

1. Introduction

Regional tourism development in Jakarta empowers human resources, natural and cultural resources usage, science and technology, cross-sector cooperation, empowering small businesses and cooperation between global cities. Jakarta Open Data (2018) found that the number of overseas and Indonesian tourists coming to Jakarta in 2013 arrived at 2,313,792 and 26,156,467; in 2014 achieved 2,319,295 and 26,994,509; in 2015 attained 2,377,226 and 30,512,989; in 2016 attained 2,512,005 and 32,673,965; and in 2017 achieved 2,658,055 and 35,464,110, respectively. The growth of overseas and Indonesian tourists coming to Jakarta from 2013 to 2014 arrived at 0.24 % and 3.20 %, from 2014 to 2015 attained 2.50 % and 13.03 %, from 2015 to 2016 achieved 5.67 % and 7.08 %, from 2016 to 2017 reached 5.81 % and 8.54 %, respectively. The tourism has to be managed to keep up local assets to attract tourism and hinder negative influence to local societies.

In the regulation of DKI Jakarta Governor No. 6 in 2015 about Tourism, tourists in Jakarta have to keep up natural environmental conservation, tourism attractiveness, religious norms, customs, culture, values existing in local societies. Tourism in Jakarta has to be organizedas the foundation for the principles composing of upholding religious norm and cultural values to anticipaterelationship between human and God, humans, human

and environment, upholding cultural variety and local wisdom, maintaining nature and living environment, empowering communities, and obeying tourism ethical codes. Tourists have to keep up and preserve tourism attractiveness and destination, deal with naturally environmental sustainability and regional culture, assist to shape safe and clean atmosphere, conduct politely, respect religious norms, customs, culture, and values existing in local communities. Tourists are prohibited to destroy tourism attractiveness physically, pollute the environment, and change the color and shape of the environment so that uniqueness, beauty, and authentic values of tourism attractiveness will not be disappeared.

Environmental education is very critical for environmental conservation (Arsenijevic, M. & Bohanec, 2014). Activities of tourism were carried out without environmental destruction and with advantages maintained at a certain level to local communities through environmental education (Wang, Zhong, Zhang, & Zhou, 2014; Sarmiento, Romero, Roman, & Martin, 2018). Environmental education enabled conservation of nature and culture (Safitri, 2017; Safitri & Putra, 2018; Jalani, 2012; Kara, Deniz, Kilicaslan, & Polat, 2011; Sarmiento, Romero, Roman, & Martin, 2018; Yovo, Vodouhe, Assogbadjo, & Sinsin, 2017). Environmental education was estimated by satisfying natural curiosity of individuals, enhancing environmental awareness, and strengthening visitor's pro-conservation values (Arsenijevic & Bohanec, 2014; Soykan, 2008). However, there was less detail explanation about sub-aspects of environmental education.

This survey was conducted for tourists visiting Ragunan, Setu Babakan, Jaya Ancol Dreamland, Suropati Garden, Ria-Rio Reservoir City Park, Muara Karang Mangrove Forest, Taman Mini Indonesia Indah (TMII), Indraloka Park, and Kalijodo Park in the province of DKI Jakarta. Ragunan Zoo as the third oldest Zoo in the world and the second largest zoo in the world with the most diverse animals and plants population is a 140-hectare zoo located in Pasar Minggu, South Jakarta, Indonesia. Setu Babakan as a heritage area for the tribe Betawi is situated in Srengseng Swawah, Jagakarsa districts, South Jakarta, Indonesia. Jaya Ancol Dreamland as Jakarta's largest and most popular recreation park is placed in North Jakarta, Indonesia. Suropati Garden surrounded with a busy street, some high and lush trees, and good arrangement of the park is located in Menteng, Central Jakarta, Indonesia. Ria-Rio Reservoir City Park being used to collect rainwater and domestic wastewater, water balance to prevent flood, water and wetland tourism destination is located in Pedongkelan village, East Jakarta, Indonesia. Muara Angke Mangrove Forest as a protected nature conservation area is located on the north coast of Jakarta. Taman Mini Indonesia Indah (TMII) as a synopsis of Indonesian culture consisting of 26 exclusive replicas of traditional house from Aceh to Kalimantan, Sulawesi, Java, and Papua is placed in East Jakarta. Indraloka Park as a beautiful garden with animals like deer, bangau, peacock and many exotic chickens, in door waterpark, semi Olympic pool, mini zoo, and amazing panoramic view is situated in East Jakarta.Kalijodo Park as a green park, a playground, an indoor football court, an amphitheater, an international standard skate park, mosque, and food court is located in North Jakarta.

2. Literature Review

Environmental education is needed in order to keep ecological integrity and be concerned of the natural ecosystems. Conservation cannot be achieved without proper environmental education (Arsenijevic, M. & Bohanec, 2014). However, few detail explanations about sub-dimensions of environmental education existed.

Tourism activities were done without causing environmental damageon the basis of environmental education (Safitri, 2017; Safitri & Putra, 2018; Jalani, 2012; Kara, Deniz, Kilicaslan, & Polat, 2011; Sarmiento, Romero, Roman, & Martin, 2018; Yovo, Vodouhe, Assogbadjo, & Sinsin, 2017). This study found that environmental conservation, environmental responsibility, and ecosystem sustainability were done with environmental education. Wang, Zhong, Zhang, & Zhou (2014); Sarmiento, Romero, Roman, & Martin (2018) noted that supporting sustainable use of resources and preserving environment is important to create environmental protection and practices. However, few explanations about environmental education were stated.

Environmental education was predicted by satisfying natural curiosity of individuals, enhancing environmental awareness, and strengthening visitor's pro-conservation values (Arsenijevic & Bohanec, 2014;

Soykan, 2008). It was found that environmental education could support environmental awareness of participants and better comprehension of environmental problems, and make alternative solution in order to cause a sustainable environment in the future. However, there were few explanations about the environmental education dimensions.

Theoretical framework

Environmental education is estimated by satisfying natural curiosity of individuals, enhancing environmental awareness, and strengthening visitor's pro-conservation values (Arsenijevic & Bohanec, 2014). Relationships hypothesized are explained in the form of a model shown in figure 1.

3. Research Design

This study used survey research using questionnaire related to environmental education distributed to 1077 tourists having come to Ragunan Zoo, Setu Babakan, Ancol, Suropati garden, Ria-Rio reservoir city park, Muara Karang Mangrove forest, Taman Mini Indonesia Indah (TMII), Indraloka Park, and Kalijodo Park in the province of DKI Jakarta.

The researcher conducted content analysis of the environmental education literature based on Arsenijevic & Bohanec (2014) consisting of three aspects; satisfying natural curiosity of individuals, enhancing environmental awareness, and strengthening visitor's pro-conservation values. These ideals wereconverted into the questionnaire given to 1077 participants.

The questions related to environmental education includingthree dimensions: satisfying natural curiosity of individuals, enhancing environmental awareness, and strengthening visitor's pro-conservation values. Indicators of the satisfying natural curiosity of individuals dimension are knowledge improvement of the tourists about nature, positive attitude toward environment, skill improvement about environment, and environmental curiosity met. Indicators of enhancing environmental awarenessare awareness improvement of the tourists to take care the environments well, awareness improvement of the tourists not to destroy the environments, awareness improvement of the tourists not to use the environments excessively, and awareness improvement of the tourists to take care the cleanliness of the environments. Indicators of the strengthening visitor's pro-conservation values dimension are maintaining existing environmental values, responsibility of environmental management, managing environment suitable with regulation established, and using environment on the basis of conservation values.
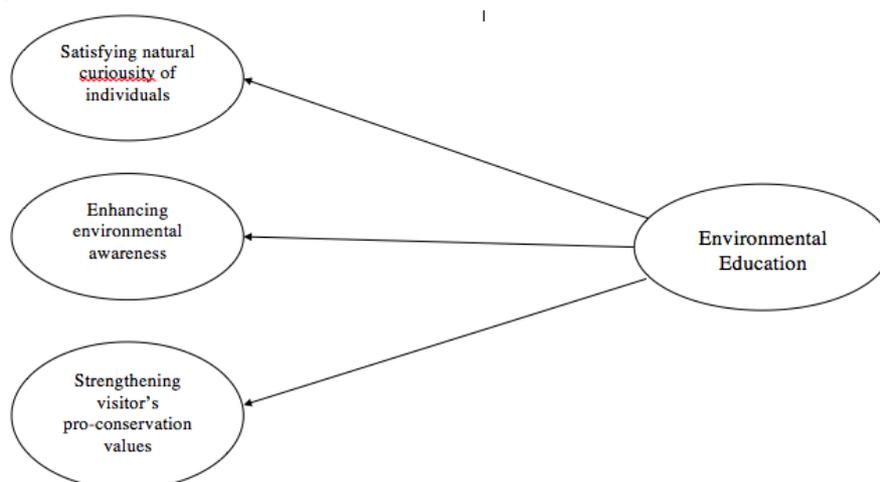

Figure 1. Theoretical framework of the study

The structural equation model (SEM) analysis using SPSS AMOS 24 was usedin this study to findthe relationships between satisfying natural curiosity of individuals, enhancing environmental awareness, and strengthening visitor's pro-conservation values with environmental education. Data input was fulfilled with Excel by entering the scores of each item based on the responses of the 1077 respondentswith "strongly agree",

"agree", "neutral", "disagree", and "strongly disagree" (scored 5, 4, 3, 2, and 1,respectively, for positive questions and 1, 2, 3, 4, and 5, respectively, for negative questions).

Findings

The goodness-of-fit statistical analysis results are exhibited in Table I. These results showed that Normed Fit Index (NFI) value attained 0.912 pointing out that the model is good fit. Comparative Fit Index (CFI) value arrived at 0.925 meaning that the model is good fit. Incremental Fit Index (IFI) value reached 0.925 presenting that the model is good fit. Relative Fit Index (RFI) value reached 0.886 indicating that the model is good fit. Table 1 also offered that the goodness-of-fit Index (GFI) was 0.955 and the adjusted GFI (AGFI) was 0.931 displaying that the model is good fit. Regarding the SEM measurement, the model hypothesized in this study is a good fit model.

Table I. Model Fit Summary

Fit measurement	Fit Value		
	Cut-Off Limitation	*Value*	*Decision*
NFI	0 < NFI < 1; NFI ≥ 0.90= good fit	0.912	Good Fit
CFI	0 < CFI < 1; CFI ≥ 0.90= good fit	0.925	Good Fit
IFI	0 < IFI < 1; IFI ≥ 0.90= good fit	0.925	Good Fit
RFI	0 < RFI < 1; RFI ≥ 0.90= good fit	0.886	Good Fit
GFI	0 < GFI < 1; GFI ≥ 0.90= good fit	0.955	Good Fit
AGFI	0 < AGFI < 1; AGFI ≥ 0.90= good fit	0.931	Good Fit

A measurement model test of the observed variables is offered in Table II. Table II showed that satisfying natural curiosity of individuals, enhancing environmental awareness, strengthening visitor's pro-conservation values are significantly associated with environmental education of 0.595, 0.973, and 0.716, respectively. Knowledge improvement of the tourists about nature, positive attitude toward environment, skill improvement about environment, and environmental curiosity met had significant association with satisfying natural curiosity of individualsof 0.627, 0.537, 0.702, and 0.543, respectively. Awareness improvement of the tourists to take care the environments well, awareness improvement of the tourists not to destroy the environments, awareness improvement of the tourists not to use the environments excessively, and awareness improvement of the tourists to take care the cleanliness of the environments as observed variables had significantly correlated with enhancing environmental awareness of 0.632, 0.698, 0,645, and 0.700, respectively. Maintaining existing environmental values, responsibility of environmental management, managing environment suitable with regulation established, and using environment on the basis of conservation values as observed variables had significantly associated with strengthening visitor's pro-conservation values of 0.640, 0.666, 0.706, and 0.609, respectively. The structural model is shown in Figure 2.

Table II. Measurement model test (Regression Weights: Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
SNCI	<---	EEDU	0.744	0.076	9.756	***	
EEW	<---	EEDU	1.646	0.165	9.979	***	
SVPV	<---	EEDU	1.000				
EE4	<---	SNCI	1.000				
EE3	<---	SNCI	1.288	0.094	13.762	***	
EE2	<---	SNCI	0.983	0.081	12.133	***	
EE1	<---	SNCI	1.168	0.088	13.220	***	
EE8	<---	EEW	1.000				
EE7	<---	EEW	0.880	0.050	17.741	***	

			Estimate	S.E.	C.R.	P	Label
EE6	<---	EEW	1.005	0.053	18.875	***	
EE5	<---	EEW	0.883	0.051	17.442	***	
EE12	<---	SVPV	1.000				
EE11	<---	SVPV	1.233	0.075	16.516	***	
EE10	<---	SVPV	1.161	0.073	15.981	***	
EE9	<---	SVPV	1.049	0.067	15.590	***	

Source: AMOS Results 2019

Table II.　　Measurement model test (Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
SNCI	<---	EEDU	0.595
EEW	<---	EEDU	0.973
SVPV	<---	EEDU	0.716
EE4	<---	SNCI	0.543
EE3	<---	SNCI	0.702
EE2	<---	SNCI	0.537
EE1	<---	SNCI	0.627
EE8	<---	EEW	0.700
EE7	<---	EEW	0.645
EE6	<---	EEW	0.698
EE5	<---	EEW	0.632
EE12	<---	SVPV	0.609
EE11	<---	SVPV	0.706
EE10	<---	SVPV	0.666
EE9	<---	SVPV	0.640

Source: AMOS Results 2019

Notes:

| EEDU	=	environmental education
SNCI	=	satisfying natural curiosity of individuals
EEW	=	enhancing environmental awareness
SVPV	=	strengthening visitor's pro-conservation values
EE1	=	knowledge improvement of the tourists about nature
EE2	=	positive attitude toward environment
EE3	=	skill improvement about environment
EE4	=	environmental curiosity met
EE5	=	awareness improvement of the tourists to take care the environments well
EE6	=	awareness improvement of the tourists not to destroy the environments
EE7	=	awareness improvement of the tourists not to use the environments excessively
EE8	=	awareness improvement of the tourists to take care the cleanliness of the environments
EE9	=	maintaining existing environmental values
EE10	=	responsibility of environmental management
EE11	=	managing environment suitable with regulation established
EE12	=	using environment on the basis of conservation values
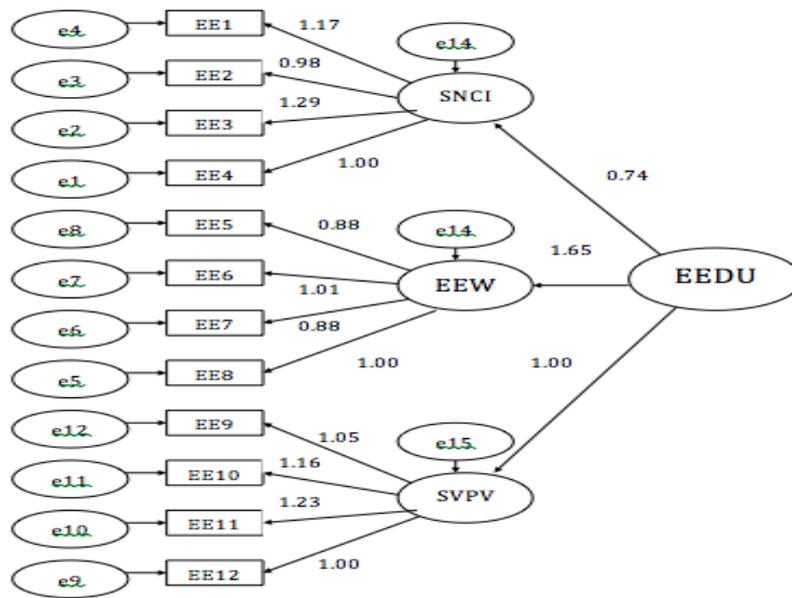
Figure 2. The structural model

Discussions

Table I presents that Normed Fit Index (NFI) value attained 0.912, which wasmore than 0.90and indicated that the model was already fit. Table 1 showed that the Comparative Fit Index (CFI) value arrived at 0.925, which was a value more than 0.90 and indicated that the model was fit. The Incremental Fit Index (IFI) value reached 0.925, which was a value greater than 0.90 pointing out that the model is good fit. Relative Fit Index (RFI) value reached 0.886, which was more than 0 and less than 0.90 indicating that the model is good fit. Table 1 also offered that the goodness-of-fit Index (GFI) was 0.955 and the adjusted GFI (AGFI) was 0.931, which was more than 0.90 displaying that the model is good fit. Based on the goodness-of-fit statistical analysis results showed that the hypothesized model was a good fit for the data.

Table II showed that satisfying natural curiosity of individuals, enhancing environmental awareness, and strengthening visitor's pro-conservation valueshad significantly positivelycorrelated with environmental education as exogenous variables with correlation coefficients of 0.595, 0.973, and 0.716, respectively.Enhancing environmental awareness was most strongly significantly associated with environmental education, whereas satisfying natural curiosity of individuals had the smallest positive correlation coefficient with environmental education. This finding is similar to the study result of Arsenijevic & Bohanec (2014) stating that satisfying natural curiosity of individuals, enhancing environmental awareness, and strengthening visitor's pro-conservation valuesestimated environmental education.

Knowledge improvement of the tourists about nature, positive attitude toward environment, skill improvement about environment, and environmental curiosity met as observed variableshad a significant positive association with satisfying natural curiosity of individuals of 0.627, 0.537, 0.702, and 0.543, respectively. Awareness improvement of the tourists to take care the environments well, awareness improvement of the tourists not to destroy the environments, awareness improvement of the tourists not to use the environments excessively, awareness improvement of the tourists to take care the cleanliness of the environments as observed variables were significantly positively correlated with enhancing environmental awareness of 0.633, 0.698, 0,646, and 0.699, respectively. Maintaining existing environmental values, responsibility of environmental management, Managing environment suitable with regulation established, and using environment on the basis of conservation values as observed variables were significantly positively connected with strengthening visitor's pro-conservation values of 0.632, 0.698, 0,645, and 0.700, respectively. In line with study result of Arsenijevic

& Bohanec (2014), environmental education support the environmental awareness and educate public to manage their behavior and ecosystems in the purpose of sustainable living.

4. Conclusion

An evidence-based model of environmental education is presented by this study. Satisfying natural curiosity of individuals, enhancing environmental awareness, and strengthening visitor's pro-conservation values predict environmental education. Satisfying natural curiosity of individuals can be stimulated by knowledge improvement of the tourists about nature, positive attitude toward environment, skill improvement about environment, and environmental curiosity. Awareness improvement of the tourists to take care the environments well, awareness improvement of the tourists not to destroy the environments, awareness improvement of the tourists not to use the environments excessively, and awareness improvement of the tourists to take care the cleanliness of the environments can estimate enhancing environmental awareness. Maintaining existing environmental values, responsibility of environmental management, managing environment suitable with regulation established, and using environment on the basis of conservation values support to strengthening visitor's pro-conservation values

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