A Model of Green Behavior for Sustaining Green School

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Abstract

This research aimed to develop a model of green behavior for sustaining green school. A questionnaire was used as the main tool for data collection from 275 students in levels four to six at Mahasarakharm University Demonstration School (Elementary) in the 2014 academic year. Structural Equation Modeling (SEM) was used for model verification. It was revealed that the exogenous variables, i.e., Environmental Education (EE) and Environmental Management (EM) could influence, through Inspiration of Public Mind (IPM), Green Behavior (GB) for 92.00 percent. Additionally,EE affected GB the most. Moreover, the exogenous variables of EE and EM were able to account for 78.00 percent variation in IPM while EE affected IPM the most.

Keywords: Inspiration of public mind, environmental management, environmental education, green behavior

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Introduction

Children are our hope for future generations in terms of environmental conservation and sustainable development. In order to achieve sustainable development, the children should pay close attention to their participation in environmental conservation with public mind and responsibility for environmental management in school (Thiengkamol, 2011e; Thiengkamol, 2011i). It was also noted that environmental education volunteers and trainers should be equipped with knowledge, understanding, awareness, and responsibility as well as inspiration of public mind. Green behavior, in addition, must be implemented with regard to consumption, recycling, energy conservation, travel, forest conservation, and knowledge transfer since it is essential for the attainment of genuine sustainable development. Such concepts should be implanted in children through all educational channels, i.e., formal, informal, non-formal, and lifelong education (Thiengkamol, 2011e; Thiengkamol, 2011i ; Thiengkamol, 2009a).

As far as elementary school students are concerned, they are energetic and curious learners. For these reasons, they must be inspired with public mind via proper learning and training activities in the fields of environmental management, energy conservation, waste management, and tree conservation, both in school and in the community. As a result, they could become important change agents in environmental conservation and sustainable development.

Mahasarakham University launched the green university concept beginning in 2009, with the vision of "First, we must make our university a great place to work and learn with green energy, green technology, green vehicles, and green waste disposal." Mahasarakham University received a "Green University" award from Universitas Indonesia (UI), from among 360 universities from 62 countries which took part in the UI GreenMetric World Universities Ranking of 2014. Mahasarakham University Demonstration School (Elementary) may be able to become a leader for developing students to have public mind for environmental conservation via green behaviors based on energy conservation, waste management, and tree conservation, with integration of environmental education principles through inspiration of public mind for environmental conservation to attain sustainable development.

Objective

The main research objective was to develop a Green Behavior model comprised of Environmental Education (EE), Environmental Management (EM), Inspiration of Public Mind (IPM), and Green Behavior (GB).

Operational Definition

Environmental Education (EE) refers to knowledge and understanding of the environment (X1), environmental attitude

(X2), environmental awareness (X3), environmental public mind (X4), and environmental responsibility (X5).

Environmental Management (EM) is composed of energy conservation (X6), waste management (X7), and tree conservation (X8).

Green Behavior (GB) consists of energy conservation (Y1), waste management (Y2), forest conservation (Y3), and the transfer of knowledge for environmental conservation (Y4).

Inspiration of Public Mind (IPM) is comprised of a person as a role model (Y5), impressive environment (Y6), and impressive event (Y7).

Hypothesis

EE and EM affect GB through IPM as conceptualized in Figure 1.

Methodology

1 Population and Sample

The population consisted of 275 elementary students in levels four to six of Mahasarakham University Demonstration School in the Northeastern region of Thailand in the 2014 academic year. The population was used as the sample group.

2 Research Instrument

A questionnaire was used as the main tool for data collection. The content and structural validity were determined by the Item Objective Congruence (IOC) method, with five experts in the aspects of environmental education, psychology, the social sciences, and social research methodology. The reliability was checked by means of internal consistency reliability for measures of environmental education, environmental management, inspiration of public mind, green behavior, and the whole questionnaire, the part-total correlation coefficients of which being 0.913, 0.902, 0.905, 0.910, and 0.946, respectively.

5.3 Data Collection

A questionnaire was used as the main tool for data collection from 275 students of Mahasarakham University Demonstration School (Elementary).

5.4 Statistical Analysis

Descriptive statistics as well as inferential statistics, particularly the Structural Equation Model (SEM), were employed for statistical analysis purposes (Ullman et al., 2003, and Markus, 2007).

Results

The results are outlined below:

1 General Characteristics of the Sample

The mean age of the sample students was 10.5 years and 54.90% were female. Most of the students (91.20%) lived at home with their parents, whose education was mostly at a bachelor's degree level (74.10%) and whose work was as government officials (56.73%). The average ages of fathers and mothers were 41.09 and 39.64 years, respectively. It was also revealed that the sample students came from families in which the annual

income of fathers and mothers averaged 1,000,000 baht and 500,000 baht, respectively.

2 Direct Effects of Variables in the Model

2.1 Environmental Education (EE) and Environmental Management (EM) directly affected Inspiration of Public Mind (IPM) significantly (P≤0.01), the effects of which being 0.65 and 0.49, respectively. Moreover, Environmental Education (EE) and Environmental Management (EM) directly affected Green Behavior (GB) significantly (P=0.01), the effects on Green Behavior being 0.20 and 0.32, respectively. In addition, Environmental Education (EE) and Environmental Management (EM) affected Green Behavior (GB) indirectly and significantly (P=0.01), the indirect effects being 0.36 and 0.27, respectively.

2.2 Inspiration of Public Mind (IPM) directly affected Green Behavior (GB) significantly (P=0.053), the effect being 0.56.

The effects of IPM, as an endogenous variable, EM and EE on GB totaled 92 percent, with IPM being the most effective variable. The result can be demonstrated mathematically in equation (1) below:

GB=0.56* IPM+0.20* EM+0.32* EE .....(1)
R2=0.92

Moreover, the exogenous variables of Environmental Management (EM) and Environmental Education (EE) were able to explain the variation in Inspiration of Public Mind (IPM) for 78.0 percent, with EE having the most effect on IPM as demonstrated in equation (2) below:

IPM=0.49*EM+0.65 .....(2)
R2=0.78

2.3 The Chi-Square value/df of 1.796 was significant (P≤0.05). Therefore, the hypothetical model of research was congruent with the empirical data. Moreover, the Goodness of Fit Index (GFI) and the Adjusted Goodness of Fit Index (AGFI) were 0.95 and 0.92, respectively (GFI> 0.90 and AGFI>0.90), whereas RMSEA and RMR were 0.045 and 0.013 (RMSEA and RMR<0.05), with a critical number of 256.11, which was more than 200. It indicated that the model was congruent with the empirical data (Ullman et al., 2003).

The results of analysis of the causal relationship model and analysis of path effect are presented in Figure 1 and Table 1.

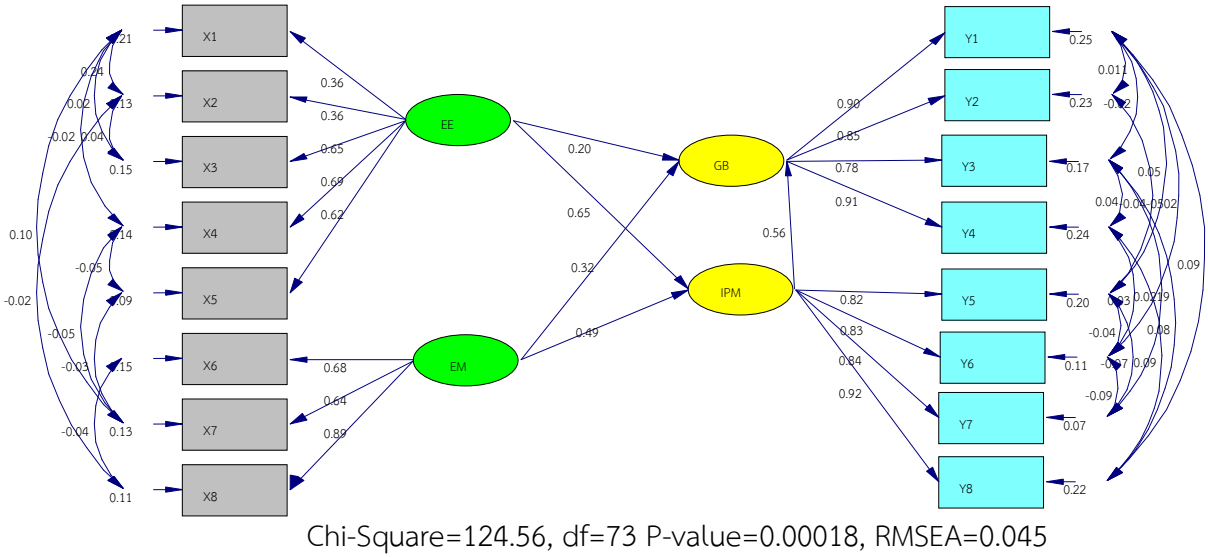

Figure 1: Causal Relationship Model among EE, EM, IPM and GB.

Table 1 Direct, Indirect and Total Effects of EE and EM Affecting GB through IPM

Causal variables	Result variables					
	IPM			GB		
	Total Effect	Indirect Effect	Direct Effect	Total Effect	Indirect Effect	Direct Effect
EE	0.65**	-	0.65**	0.56**	0.36**	0.20**
EM	0.49**	-	0.49**	0.59**	0.27**	0.32**
IPM	-	-	-	0.56**	-	0.56**
χ^2 = 124.56; df = 73			CN = 256.11		χ^2/df = 1.706	

Discussion

EE directly affected IPM and GB significantly (P<0.01), and the observed variables, i.e., Environmental Awareness (X3), Environmental Attitude (X2), Environmental Responsibility (X5), Environmental Public Mind (X4), and Knowledge and Understanding (X1), on the one hand, were highly correlated, with EE, on the other. The results were consistent with the studies by Thiengkamol and her colleagues (Office of the United Nations Higher Commissioner for Human Rights, 2012; Thiengkamol, 2012d; Thiengkamol, 2011i; Thiengkamol, 2012g; Thiengkamol, 2012h; Pimdee et al., 2012a; Phinnarach, et al., 2012a; Kotchakote et al., 2013a).

It was also demonstrated that EM directly influenced IPM and GB significantly (P≤0.01). Moreover, observed variables, i.e., Energy Conservation (X6), Waste Management (X7), and Tree Conservation (X8) could significantly predict EM. Studies conducted by Thiengkamol and her colleagues (Office of the United Nations Higher Commissioner for Human Rights, 2012; Thiengkamol, 2012d; Thiengkamol, 2011i; Thiengkamol, 2012g; Thiengkamol, 2012h; Pimdee et al., 2012a; Phinnarach, et al., 2012a; Kotchakote et al., 2013a) had revealed similar results.

However, it could be concluded that EE and EM could influence GB through IPM. Therefore, by verification, using Chi-square and related statistical techniques, it could be concluded with some some degree of certainty that the proposed model of EE and EM influencing GM through IPM was supported by empirical data.

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