Causal Relationship Model of Environmental Health Integrated with Environmental Education

Sapphasit Kaewhao

สรรพสิทธิ์ แก้วเฮ้า

Faculty of Science and Technology, Rajabhat Mahasarakham University

คณะวิทยาศาสตร์และเทคโนโลยี มหาวิทยาลัยราชภัฏมหาสารคาม

Abstract

The objective of research was to develop the causal relationship model of environmental health and environmental education affecting the behavior of environmental health for (healthy living) through inspiration of environmental conservation. The population was 15,157 undergraduate students of Rajabhat Mahasarakham University in first semester of academic year of 2016. The simple random sampling technique was employed to collect the sample for 400 undergraduate students. The questionnaire was used as tool for data collection with Structural Equation model (SEM) was used for model verification. The results revealed structural model factors of Environmental Health Knowledge (EHK) and Environmental Education (EE) could explain the variation of endogenous factors of Inspiration of Public Mind (INS) to cause Environmental Health Behavior (EBH) with 86.00 percent as the following in equation (1). EHB = 0.40*INS + 0.35*EHK + 0.22*EE ………………….………… (1) (R2 = 0.86) Moreover, Environmental Health Knowledge (EHK) factors and Environmental Education (EE) factors could explain the variation of confirmatory factors of Inspiration of Public Mind (INS) with 82.00 percent. Therefore, the equation can be written as the following equation (2). INS = 0.18*EHK + 0.94*EE …………………….…………(2) (R2 = 0.95) Equation (2) factors that had the most effect to Inspiration of Public Mind (INS) to cause Environmental Health Behavior (EBH) was Environmental Education (EE) with the effect of 0.94 and subsequence was Environmental Health Knowledge (EHK) with the effect of 0.18. These could explain the variation of Inspiration of Environmental Conservation with 95.00 percent. Considering on Chi-Square value/df was 1.736 that was lesser than 5, therefore it was accepted that hypothetical model of research was congruent to empirical data. Moreover, it was considered on other statistical values to verify the congruence that were Goodness of Fit Index (GFI) and Adjust Goodness of Fit Index (AGFI) were 0.94 and 0.91 respectively (GFI > 0.90 and AGFI > 0.90), RMSEA <0.05 (0.045) and critical number = 216.55 which was more than 200. It indicated that model was congruent to empirical data.

Keywords: causal relationship model, environmental health, environmental education

Introduction

Environmental health addresses all the physical, chemical, and biological factors external to a person, and all the related factors impacting behaviors. It encompasses the assessment and control of those environmental factors that can potentially affect health. It is targeted towards preventing disease and creating health-supportive environments. This definition excludes behavior not related to environment, as well as behavior related to the social and cultural environment, and genetics (WHO, 2014).

Ministry of Public Health with the corroboration of Ministry of Environment and Natural Resources of Thailand issued The Second National Environmental Health Strategy Plan B.E.255-2559 in order to be guidelines for implementation environmental health of Thailand by emphasizing on the participation of network of all sectors and people from every level of society. Even though, Office of Environmental Health has continuously implemented since The First National Environmental Health Strategy Plan B.E.2552-2554 but the present environmental problems are numbers and more complex and impacted to human health increasingly (Office of Environmental Health, 2012).

As mentioned above, environmental health refers to all aspect of physical, chemical, and biological features external to a person and related to human behavior but when considering on each aspect covers air quality, hygiene water, public and environmental health, management of waste and hazardous waste, chemical substance and toxic substance, climate change, management of environmental health in urgent situation, and health impact assessment (Office of Environmental Health, 2012). Regarding to environmental health with the complete feature, it would covers (1) providing clean water for drinking and other consumptions adequately including planning for water production and distribution, (2) controlling water pollution by preventing pollution and controlling and maintaining quality at origin sources

of water like as river, canal, swamp and so on including sea water and underground water. Moreover, control at the point of pollution sources covering household, agricultural, and industrial sources, (3) management of waste and hazardous waste for disease control and prevention of dispersion, (4) control arthropod and rodent animals that are the vector of diseases to human such as diarrhea, malaria, dengue, bubonic plague and leptospirosis, (5) Prevention and control soil pollution from drainage wastewater, waste and hazardous waste from industrial activities and human activities, (6) food sanitation with germs and toxic substances control because food is essential for human health meanwhile it is also able to be a medium for disease transmission, therefore the food sanitation addresses on food hygiene and safety are emphasized at starting point of caring on raw material, preparation, production, transportation and distribution including providing knowledge to consumer, (7) Air pollution control by preventing the contamination and maintaining air quality, not impact to property and human health, (8) prevent the danger from radiation that is used in diverse activities whether food preservation, medical treatment, and other activities, (9) environment health is prevention and control environment in workplace for all aspects of physical, chemical and biological features by arranging the appropriate working and studying environments continuously, (10) control the noise pollution with over standard because to loud noise can disturb the mental concentration and harm to human health, (11) management on environmental shelter habitat and institute to be hygiene, safeand aesthetics view for living , (12) city planning properly for instances business area, industrial area, living area to provide non traffic congestion, to maintain physical and mental health, (13) environmental health arrangement involved transportation by controlling all sectors of transportation whether in terms of land, water, and air, (14) Prevention accident and emergency event to decrease the injury, mortality and handicap rates, (15)

environmental health of recreation site by arranging and providing the clean, safe and without disease spreading such as swimming pool and public park, (16) sanitation implementation when disease epidemic, emergency event, disaster and migration, and (17) general measurement to prevent environment from any risk or harm to human health (WHO, 2014; Thiengkamol, 2009; Thiengkamol, 2011a; Office of Environmental Health, 2012)

Environmental education concepts are relevant to sustainable development principles in fundamental scheme that of sustainable development in accord to conference of environment and development of United Nation since 1992 that clarified in Agenda 21 of global action plan mentioned that "Sustainable development is development which meets the needs of the presented without compromising the ability of future generations to accomplish their own needs" (Volker, 2007; Office of National Economic and Social Development Plan, 2010; Thiengkamol, 2011a). This is fundamentally to clarify that people at present generation should have knowledge and understanding to concern environmental problems. Consequently, any human activities for living, they need to devour the natural resources that impacted to the environmental quality, therefore they must take responsibility for their activities that they execute with public mind to sincerely preserve the environment and natural resources. They must have appropriate behavior for pro-environment based on correct awareness and positive attitude to participate in environmental projects and activities including having sensitivity to make decision to maintain environmental quality. They should practice regularly until it becomes a firm routine habit and pay attention to maintain the environmental quality without requisite of rewards, money motivation or admiration (Thiengkamol, 2009; Thiengkamol, 2009; Thiengkamol, 2011a; Thiengkamol, 2011b).

However, sustainable development with 18 principles that was proposed since 1992 at International Conference held by United Nation at Rio de Janeiro in Brazil. However, these principles are emphasized that is "In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process, and cannot be considered in isolation from it. Eradicating poverty and reducing disparities in living standards in different parts of the world are essential to achieve sustainable development and meet the needs of the majority of people.

Accordingly, Thiengkamol mentioned on public consciousness or public mind based on inspiration from insight and inspiration different from motivation because inspiration needs no rewards. Inspiration of public consciousness or public mind, especially, for natural resources and environment conservation, one doesn't receive any reward, admiration or complement for ones act for natural resources and environment conservation. Inspiration on might occur due to appreciation in a person as role model or idle, events, situations, environment, media perceived such movies, book, magazine, and internet. (Thiengkamol, 2012a; Thiengkamol, 2012b). Concurrently, the various researches were implemented by her colleagues, these have also confirmed that inspiration of public consciousness or public mind are essential for environmental conservation in divers target groups about environmental management with integration of environmental education principle (Waewthaisong, et al., 2012).

It was rarely found the research operated environmental health behavior with consideration on environmental health knowledge and environmental education through inspiration of public mind for environmental health. Therefore, environmental education includes knowledge and understanding, awareness, attitude, participation and responsibility (WHO, 2014). However, there is no research is holistically integrative implementation on environmental health and environmental education when comparing to other

related factors affecting to environmental health behaviors. Therefore, this research was intended to study by covering all factors relating as mentioned above, it would be able to develop a model of environmental health behavior that are affected by environmental health and environmental education.

Objective

The objective of research was to develop the causal relationship model of environmental health knowledge and environmental education affecting to environmental health behavior through inspiration of public mind.

Methodology

The research design was conducted steps by step as follows:

1. The populations were 17,666 undergraduate students of Rajabhat Mahasarakham University in second semester of academic year of 2016. The simple random sampling technique was used to collect the sample of 400 undergraduate students from different faculties of Rajabhat Mahasarakham University.

2. The research instrument was the questionnaire with 88 items and it was used for data collection. The content and structural validity were determined by Item Objective Congruent (IOC) with 5 experts in the aspects of environmental health, environmental education, psychology, social science and social research methodology. The reliability was done by collecting the sample group from 50 undergraduate students of Roi-Et Rajabhat University which is similar characteristics to Rajabhat Mahasarakham University. The reliability was determined by Cronbach's Alpha. The reliability

of environmental health knowledge, environmental education, inspiration of public mind, environmental health behavior and the whole questionnaire were 0.940, 0.945, 0.950, 0.974 and 0.966 respectively.

3. The descriptive statistics used were frequency, percentage, mean and standard deviation. The inferential statistics used was Structural Equation Model (SEM) and analyzed with LISREL version 8.30by considering on Chi-Square value differs from zero with no statistical significant at 0.05 level or Chi-Square/df value with lesser or equal to 5, RMSEA (Root Mean Square Error Approximation) value and RMR (Root Mean Square Residual) with lesser than 0.05 including index level of model congruent value, GFI (Goodness of Fit Index) and critical number, and index level of model congruent value, AGFI (Adjust Goodness of Fit Index) between 0.90-1.00.
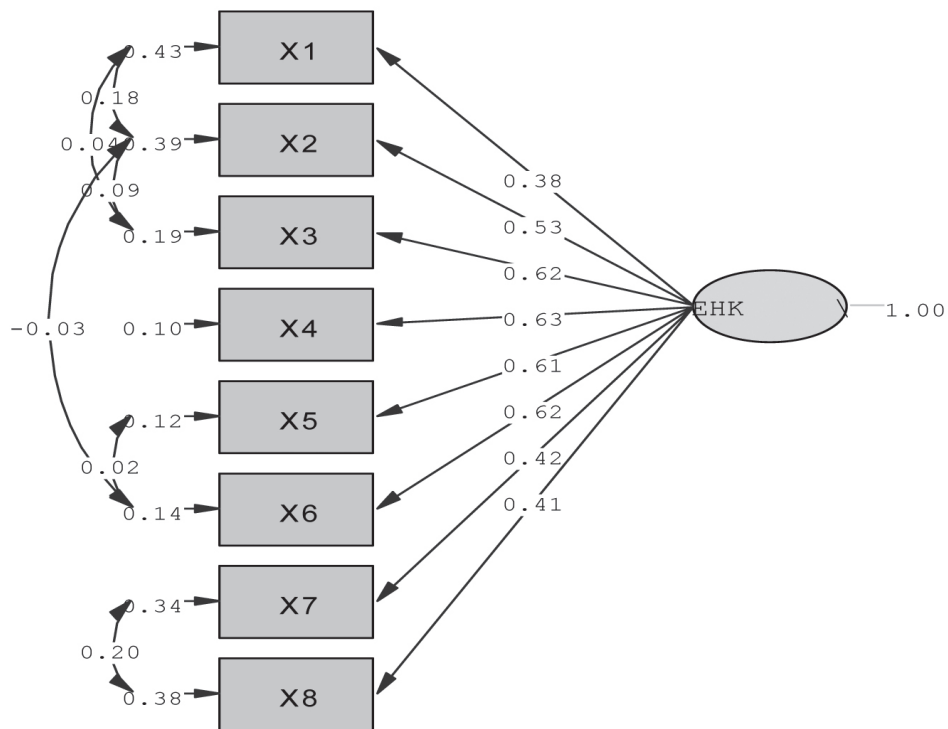
Results

1. Results of Confirmatory Factors Analysis of Exogenous Variables

1.1 Confirmatory factors Analysis of Exogenous Variables of Environmental Health Knowledge (EHK)

Confirmatory Factor Analysis of Exogenous Variables of Environmental Health Knowledge (EHK) affecting to Environmental Health Behavior (EHB) was revealed as the followings.

Confirmatory factors of EHK had Bartlett's test of Sphericity of 2085.522 statistically significant level (p< 0.01) and Kaiser–Mayer–Olkin (Measure of Sampling Adequacy--MSA) of 0.882. This indicated that components of EHK aspect had proper relationship at good level and it can be used for analysis of confirmatory factors as shown in picture 1 and table 1.

Chi-Square = 18.64, df = 14, P-value = 0.17927, RMSEA = 0.029

Figure 1 Model of Confirmatory factors of Environmental Health Knowledge

Table 1

Results of Analysis of Confirmatory factors of Environmental Health Knowledge

Confirmatory factors of Environmental Health Knowledge		Weight	SE	t	R^2
X1	Physical Environment	0.38	0.037	10.31**	0.25
X2	Environmental Sanitation	0.53	0.038	13.64**	0.41
X3	Food Sanitation	0.62	0.032	19.37**	0.67
X4	Waste Management	0.63	0.028	22.39**	0.80
X5	Contagious Disease Prevention	0.61	0.029	21.40**	0.77
X6	Disease Vector Control	0.62	0.030	20.40**	0.72
X7	Management of Institutional Environment	0.42	0.034	12.52**	0.52
X8	Prevention of Accident and Injury	0.41	0.035	11.52**	0.30

Chi-square = 18.64df= 14p = 0.17927

GFI = 0.99 AGFI = 0.97RMSEA = 0.029RMR =0.011

** Statistically significant level of 0.01

From picture 1 and table 1, results of analysis of confirmatory factors of EHK from 8 observe variables were revealed that the model was congruent to empirical data by considering from (1) Goodness of Fit Index (GFI) equaled to 0.99 and Adjust Goodness of Fit Index (AGFI) equaled to 0.97 (2) Root Mean Square Error of Approximation (RMSEA) equaled to 0.029 (RMSEA<0.05) and (3) Chi- Square value had no statistically significant at level of 0.01 and divided by degree of freedom was lesser than or equaled to 5 (χ^2/df ≤ 5.00).

Considering on loading weight of 8 observed variables in model, it was revealed that observed variables had loading weight with 0.38 to 0.63 and had covariate to model of EHK with 25.00 to 80.00 percent.

1.2 Confirmatory Factors Analysis of Exogenous Variables of Environmental Education (EE)

Confirmatory Factor Analysis of Exogenous Variables of Environmental Education (EE) affecting to Environmental Health Behavior (EHB) was revealed as the followings.

Confirmatory factors of EE had Bartlett's test of Sphericity of 1889.629 statistically significant level of 0.01, and Kaiser–Mayer–Olkin Measure of Sampling Adequacy (MSA) of 0.866. This indicated that components of EE aspect had proper relationship at good level and it can be used for analysis of confirmatory factors as shown in picture 2 and table 2.
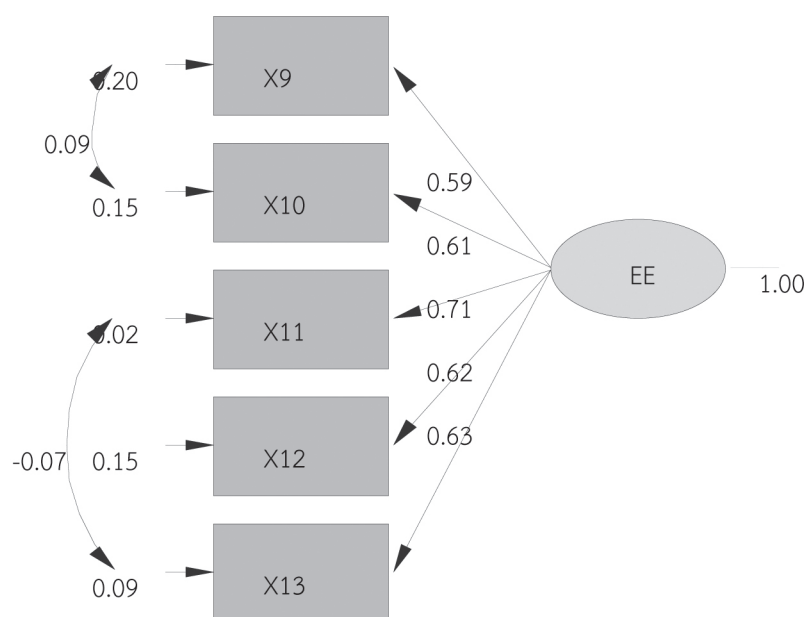
Chi-Square=2.73, df=3, P-value=0.43472, RMSEA=0.000

Figure 2 Results of Analysis of Confirmatory factors of Environmental Education

Table 2

Results of Analysis of Confirmatory Factors of Environmental Education

	Components of Environmental Education	Weight	SE	t	R^2
X9	Environmental Knowledge	0.59	0.031	18.92**	0.63
X 10	Environmental Attitude	0.61	0.030	20.58**	0.71
X11	Environmental Awareness	0.71	0.027	26.00**	0.96
X12	Environmental Participation	0.62	0.030	20.82**	0.72
X13	Environmental Responsibility	0.63	0.028	22.28**	0.82

Chi-square = 2.73df= 3P = 0.43472

GFI = 1.00 AGFI = 0.99RMSEA = 0.000RMR = 0.0030

** Statistically significant level of 0.01

From picture 2 and table 2, results of analysis of confirmatory factors of EE from 5 observed variables was revealed that the model was congruent to empirical data by considering from (1) Goodness of Fit Index (GFI) equaled to 1.00 and Adjust Goodness of Fit Index (AGFI) equaled to 0.99, (2) Root Mean Square Error of Approximation (RMSEA) equaled to 0.000 (RMSEA < 0.05), and (3) Chi- Square value had no statistically significant at level of 0.01 and divided by degree of freedom was lesser than or equaled to 5 (χ^2/df ≤ 5.00).

Considering on loading weight of 5 observed variables in model, it was revealed that observed variables had loading weight with 0.59 to 0.71 and had covariate to model of EE with 63.00 to 96.00 percent.

2. Confirmatory Factors Analysis of Endogenous Variables

2.1 Confirmatory Factors Analysis of Endogenous Variables of Inspiration of Public Mind (INS)

Confirmatory Factors Analysis of Endogenous Variables of Inspiration of Inspiration of Public Mind (INS) influencing to Environmental Health Behavior (EBH) was revealed as the followings.

Confirmatory Factors of Inspiration of Inspiration of Public Mind (INS) had Bartlett's test of Sphericity of 1060.964 statistically significant level (p< 0.01) and Kaiser–Mayer–Olkin Measure of Sampling Adequacy/MSA) of 0.836. This indicated that components of Inspiration of Inspiration of Public Mind (INS) aspect had proper relationship at good level and it can be used for analysis of confirmatory factors as shown in picture 3 and table 3.
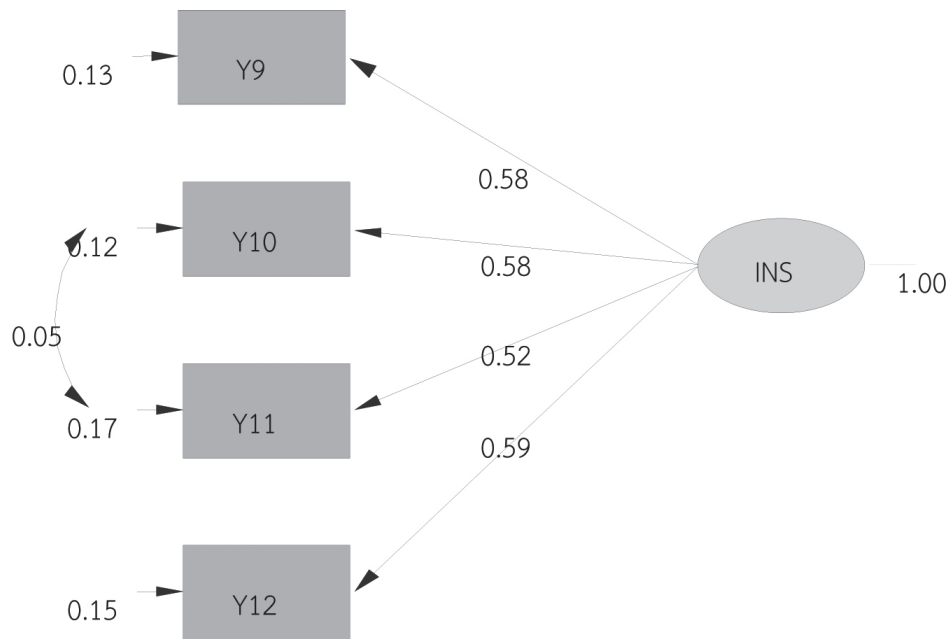
Chi-Square=0.78, df=1, P-value=0.37640, RMSEA=0.000

Figure 3 Model of Confirmatory factor of Inspiration of Public Mind (INS)

Table 3

Results of Analysis of Confirmatory factors of Inspiration of Public Mind (INS)

	Components of Inspiration of Public Mind	Weight	SE	t	R^2
Y9	Person as Role Model	0.58	0.029	21.30**	0.72
Y10	Impressive Event	0.58	0.030	19.89**	0.74
Y11	Impressive Environment	0.52	0.029	22.84**	0.62
Y12	Diverse Media Receptions	0.59	0.028	23.01**	0.70

Chi-square = 0.76df= 1P = 0.37640

GFI = 1.00AGFI = 0.99RMSEA = 0.000RMR = .0017

** Statistically significant level of 0.01

From picture 3 and table 3, results of analysis of confirmatory factors of INS from 4 observed variables was revealed that the model was congruent to empirical data by considering from (1) Goodness of Fit Index (GFI) equaled to 1.00 and Adjust Goodness of Fit Index (AGFI) equaled to 0.99 (2) Root Mean Square Error of Approximation (RMSEA) equaled to 0.000 (RMSEA<0.05), and (3) Chi-Square value had no statistically significant at level of 0.01 and divided by degree of freedom was lesser than or equaled to 5 (X^2/df ≤ 5.00).

Considering on loading weight of 4 observed variables in model, it was revealed that observed variables had loading weight with 0.52 to 0.59 and had covariate to model of INS with 62.00 to 74.00 percent.

2.2 Confirmatory Factors Analysis of Endogenous Variables of Environmental Health Behaviors (EHB)

Confirmatory Factors of Environmental Health Behavior (EBH) had Bartlett's test of Sphericity of 11598.554 statistically significant level (p< 0.01) and Kaiser–Mayer–Olkin (Measure of Sampling Adequacy--MSA) of 0.856. This indicated that components of EHB aspect had proper relationship at good level and it can be used for analysis of confirmatory factors as shown in picture 4 and table 4.
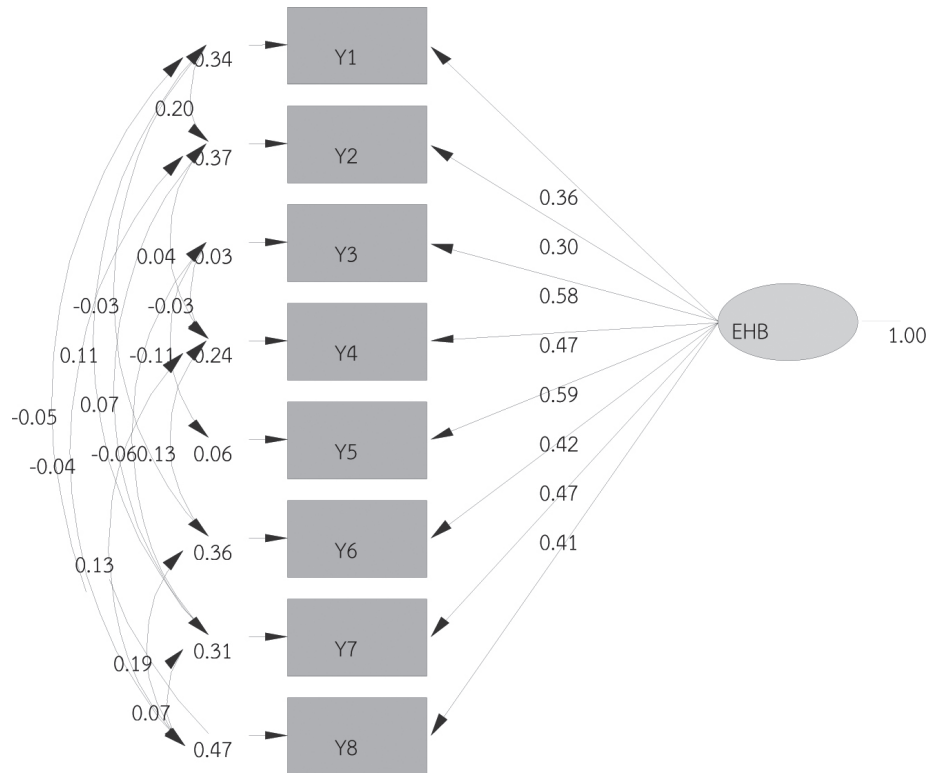
Chi-Square=4.79, df=6, P-value=0.57120, RMSEA=0.000

Figure 4 Model of Confirmatory factors of Environmental Health Behavior

Table 4

Results of Analysis of Confirmatory factors of Environmental Health Behavior

	Components of Environmental Behaviors	**Weight**	**SE**	**t**	**R^2**
Y1	Consumption Behavior	0.36	0.033	10.97**	0.28
Y2	Waste Management Behavior	0.30	0.032	9.28**	0.20
Y3	Personal health Behavior	0.58	0.034	17.13**	0.91
Y4	Disease Prevention and Control Behavior	0.47	0.033	14.18**	0.47
Y5	Good Living Behavior	0.59	0.030	19.51**	0.86
Y6	Shelter Sanitation Behavior	0.42	0.035	12.02***	0.33
Y7	Energy Conservation Behavior	0.47	0.036	13.17**	0.56
Y8	Accidental Prevention Behavior	0.41	0.038	10.80**	0.63

Chi-square = 4.79df= 6P = 0.57120

GFI = 1.00AGFI = 0.98RMSEA = 0.000RMR = 0.0062

** Statistically significant level of 0.01

From picture 3 and table 3, results of analysis of confirmatory factors of Environmental Health Behavior (EBH) from 8 observed variables was revealed that the model was congruent to empirical data by considering from 1) Goodness of Fit Index (GFI) equaled to 1.00 and Adjust Goodness of Fit Index (AGFI) equaled to 0.98,2) Root Mean Square Error of Approximation (RMSEA) equaled to 0.000 (RMSEA < 0.05) and 3) Chi- Square value had no statistically significant at level of .01 and divided by degree of freedom was lesser than or equaled to 5 (χ^2/df ≤ 5.00).

Considering on loading weight of 8 observed variables in model, it was revealed that observed variables had loading weight with 0.30 to 0.59 and had covariate to model of EHB with 20.00 to 91.00 percent.

3. Results of Effect among Variables in Model in Terms of Direct Effect

3.1 Confirmatory factors of Environmental Health Knowledge (EHK) had direct effect to Inspiration of Public Mind (INS) and Environmental Health Behavior (EBH) with statistically significant at level of 0.01 with effect of 0.18 and0.35.Moreover, confirmatory factors in aspect of Environmental Health Knowledge (EHK) had indirect effect to Environmental Behaviors for Global Warming Alleviation (BEH) with no statistically significant at level of 0.05 with effect of 0.07.

3.2 Confirmatory factors of Environmental Education (EE) had direct effect to Inspiration of Public Mind (INS) and Environmental Health Behavior (EBH) with statistically significant at level of 0.01 with effect of 0.94 and 0.22. Moreover, confirmatory factors in aspect of Environmental Education (EE) had indirect effect to Environmental Health Behavior (EBH) with statistically significant at level of 0.01 with effect of 0.38.

3.3 Confirmatory factors of Inspiration of Public Mind (INS) had direct effect to Environmental Health Behavior (EBH) with statistically significant at level of 0.01 with effect of 0.40.

3.4 Considering on structural model confirmatory factors of Environmental Health Knowledge (EHK) and Environmental Education (EE) were able to explain the variation of endogenous factors of Inspiration of Inspiration of Public Mind (INS) to cause Environmental Health Behavior (EBH) with 86.00 percent as the following in equation (1).

$$EHB = 0.40*INS + 0.35*EHK + 0.22*EE \ldots\ldots\ldots(1)$$

$$(R^2 = 0.86)$$

Moreover, confirmatory factors Environmental Health Knowledge (EHK) and Environmental Education (EE) were able to explain the variation of confirmatory factors of Inspiration of Public Mind (INS) with 82.00 percent. Therefore, the equation can be written as the following equation (2).

$$INS = 0.18*EHK + 0.94*EE \ldots\ldots\ldots\ldots\ldots(2)$$

$$(R^2 = 0.95)$$

Equation (2) factors that had the most effect to Inspiration of Public Mind (INS) to cause Environmental Health Behavior (EBH) was Environmental Education (EE) with the effect of 0.94 and subsequence was Environmental Health Knowledge (EHK) with the effect of 0.18. These were able to explain the variation of Inspiration of Environmental Conservation with 95.00 percent.

Model validation was considered on Chi-Square value/df was 1.736 that was lesser than 5, therefore it was accepted that hypothetical model of research was congruent to empirical data. Moreover, it was considered on other statistical values to verify the congruence that were Goodness of Fit Index (GFI) and Adjust Goodness of Fit Index (AGFI) were 0.94 and 0.91 respectively (GFI > 0.90 and AGFI > 0.90), RMSEA <0.05 (0.045) and critical number = 216.55 which was more than 200. It indicated that model was congruent to empirical data.

The results of analysis of causal relationship 5 and table 5.
model and analysis of path effect as presented in picture
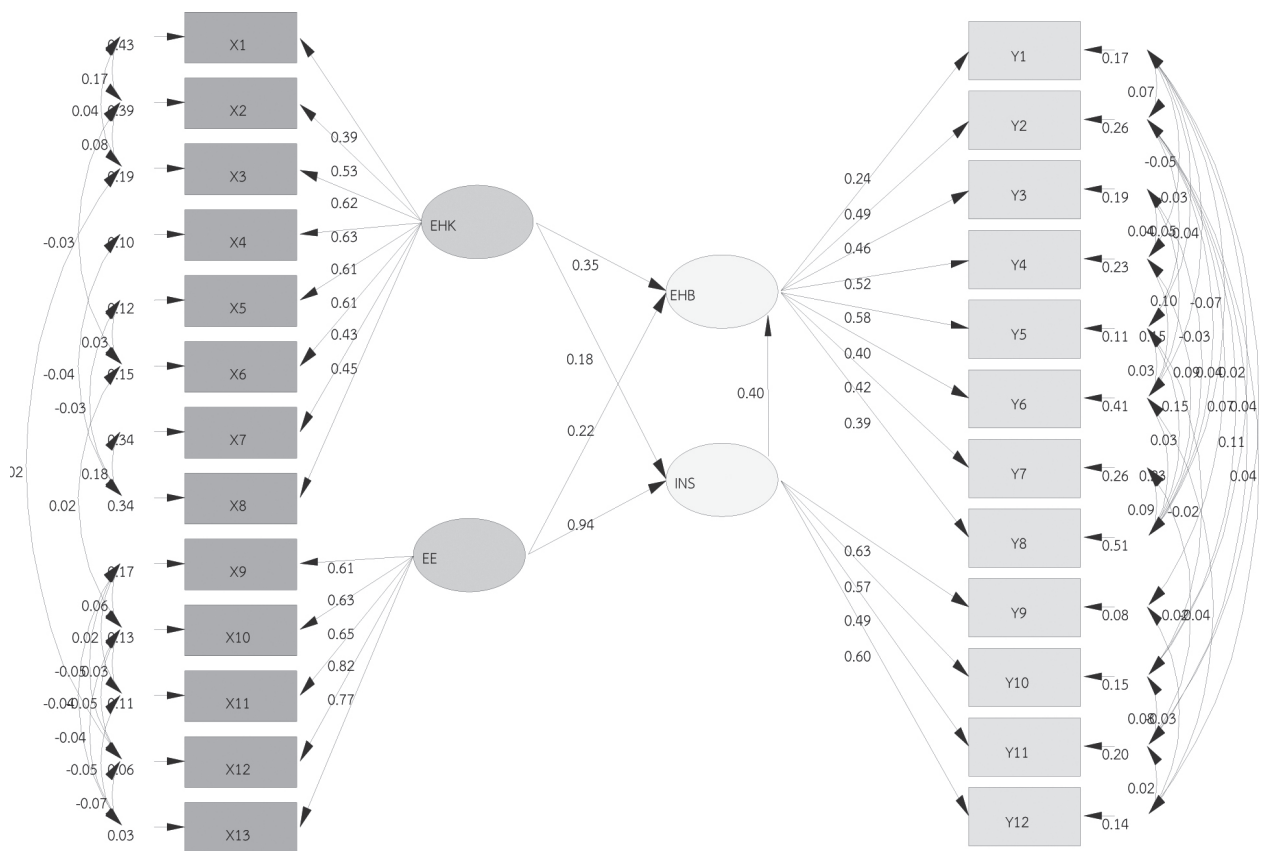
Chi-Square=378.45, df=218, P-value=0.00000, RMSEA=0.045

Figure 5 Causal Relationship Model of Environmental Health Integrated with Environmental Education

Table 5

Results of Direct and Indirect Effects among Variables in Model

Causal Variables	Result variables					
	INS			EHB		
	TE	IE	DE	TE	IE	DE
EHK	0.18**	-	0.18**	0.35**	0.07	0.42**
	(0.15)		(0.13)	(0.05)	(0.15)	(0.019)
EE	0.94**	-	0.94**	0.22**	0.38**	0.60**
	(0.28)		(0.28)	(0.16)	(0.26)	(0.29)
INS	-	-	-	0.40**	-	0.40**
				(0.044)		(0.044)
χ^2 = Chi-Square = 378.45; df=218		P = .0000		χ^2/df = 1.736		
GFI = 0.94 ; AGFI = .91		RMSEA = 0.045		RMR = 0.032		

Discussion

The findings indicated that Environmental Health Knowledge (EHK) and Environmental Education (EE) had direct effect to Environmental Health (EHB) with statistically significant at level of 0.01 with effect of 0.35 and 0.22. Considering from observed variable of Waste Management (X4), was highest correlation to Environmental

Health Knowledge (EHK) with 0.80 and Environmental Awareness (X11) was highest correlation to Environmental Education (EE) with 0.96. This might be explained that the sample groups who are undergraduate students have recognized to the importance of waste accumulation in the university, therefore they have realized to raise the environmental awareness critical to assist to waste reduction. Consequently, Contagious Disease Prevention (X5), Disease Vector Control (X6), and Food Sanitation (X3), had rather high correlation to Environmental Health Knowledge (EHK) with 0.77, 0.72 and 0.67 respectively. It is obviously seen that the undergraduate students have accepted that when the waste accumulation increasingly, the food sanitation, disease vector control, and contagious disease prevention should be paid attention. Simultaneously, Environmental Responsibility (X13), Environmental Participation (X12), and Environmental Attitude (X10) had rather high correlation to Environmental Education (EE) with 0.82, 0.72 and 0.71 respectively. This indicated that to challenge undergraduate students to participate in environmental projects and activities with positive attitude and responsibility will alleviate the environmental problems in different aspect when considering on other environmental health knowledge about university physical environment, environment sanitation, management of institutional environment and prevention of accident and injury are all important to maintain environmental health of Rajabhat Mahasarakham University.

However, Inspiration of Public Mind (INS) was revealed as very essential endogenous latent variable affected to result variable of Environmental Health Behaior (EHB) with the highest prediction power with 0.40. Meanwhile exogenous latent variable of Environmental Education (EE) influenced to endogenous latent variable Inspiration of Public Mind (INS) as mediator variable with the highest prediction power with 0.94. Moreover, observed variables of Environmental Knowledge (X9), Environmental Attitude (X10), Environmental Awareness (X11), Environmental Participation (X12), and Environmental Responsibility (X13) are rather similar prediction power to exogenous latent variable of Environmental Education (EE) with 0.63, 0.71, 0.96, 0.72, and 0.82. Simultaneously, observed variables of Person as Role Model (Y9), Impressive Event (Y10), Impressive Environment (Y11), and Diverse Media Receptions (Y12) also had closely similar prediction power to endogenous latent variable of Inspiration of Public Mind (INS) with 0.72, 0.74, 0.62 and 0.70.

Additionally, observed variables of Consumption Behavior (Y1), Waste Management Behavior (Y2), Personal health Behavior (Y3), Disease Prevention and Control Behavior (Y4), Good Living Behavior (Y5), Shelter Sanitation Behavior (Y6), Energy Conservation Behavior (Y7) and Accidental Prevention Behavior (Y8) are able to predict Environmental Health Behaviors with 0.28, 0.20, 0.91, 0.47, 0.86, 0.33, 0.56, and 0.63. It is obviously seen that the Personal health Behavior (Y3) was the highest prediction power with 0.91 and subsequences were Good Living Behavior (Y5) with 0.86, Accidental Prevention Behavior (Y8) with 0.63, Energy Conservation Behavior (Y7) with 0.57, Disease Prevention and Control Behavior (Y4) with 0.47, Shelter Sanitation Behavior (Y6) with 0.33, Consumption Behavior (Y1) with 0.28, and Waste Management Behavior (Y2) with 0.20. It can be explained that most undergraduate students performed better personal health but they had rather poor waste management behavior.

These were congruent to Thiengkamol concept (Thiengkamol, 2012a; Donkonchum & Thiengkamol, 2012; Pimdee, et al., 2012; Phinnarach, et al., 2012; Chomputawat, et al., 2013; Kotchachote, et al., 2013; Mongkonsin, et al., 2013;) that the results illustrated that environmental education in fluencing through inspiration of public mind for environmental conservation to perform better environmental behaviors whether consumption behavior, energy conservation behavior, waste management behavior, traveling behavior and knowledge transferring and supporting for environmental conservation when they had real practice through environmental conservation with inspiration of environmental conservation with public mind.

Recommendations

However, it should be introduced environmental health knowledge and environmental education concepts to implement in higher education institute like as college and university across the country to challenge the students to be aware and concern the environmental problems that are able to occur from their personal health, shelter and institute environment management covering food sanitation, waste management, air, water and soil quality control including prevention of arthropod and rodent animal control, decreasing the waste accumulation, radiation control and accidental prevention including environmental health on disaster phenomenon, particularly the motor-bicycle riding with public mind concern to themselves and other peoples (Thiengkamol, 2012c; Artwanichakul, et al., 2012; Donkonchum & Thiengkamol, 2012; Gonggool, et al., 2012; Phinnarach, et al., 2012; Prasertsri, et al., 2013; Suebsing, et al., 2013).

However, it might be concluded whether EHK, EE, and INS latent variables are play significant roles to cause environmental health behavior of consumption behavior, waste management behavior, personal health behavior, disease prevention and control behavior, good living behavior, Shelter sanitation behavior, energy conservation behavior and accidental prevention behavior through INS. Therefore, the model of EHK, and EE affecting through INS to EBH was verified the proposed model was fitted with all observed variables according to criteria of Chi-Square value differs from zero with no statistical significant at 0.01 level or Chi-Square/df value with lesser or equal to 5, RMSEA (Root Mean Square Error Approximation) value with lesser than 0.05 including index level of model congruent value, GFI (Goodness of Fit Index) and index level of model congruent value, AGFI (Adjust Goodness of Fit Index) between 0.90-1.00.

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