

Factors Affecting Green Behavior of Elementary Student

ปัจจัยที่มีผลต่อพฤติกรรมสีเขียวของนักเรียนประถมศึกษา

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Abstract

The research objectives were to study the environmental education level, public mind for environmental conservation level, and green behavior level, and to study the independent variables of environmental education in terms of environmental knowledge and understanding, environmental attitude, environmental awareness, environmental responsibility, and public mind for environmental conservation affecting dependent variable of green behavior of elementary school students. The populations of 274 elementary students at level 4-6 of Mahasarakham University Demonstration School (Elementary) in Northeastern region of Thailand in Academic year of 2014 were used as sample group. Research tool was questionnaire that was conducted for data collection. Statistic data analysis were percentage, S.D. and multiple regression analysis to predict the relationship between independent variables and dependent variable. The findings illustrated that environmental education, public mind for environmental conservation and green behavior of elementary school students were at most levels. Moreover, independent variables comprising of environmental knowledge and understanding, environmental attitude, environmental awareness, environmental responsibility, and public mind for environmental conservation affected to dependent variable green behavior of elementary school students with 84.30 percent of power prediction (Adjusted $R^2 = 0.843$). Recommendation of this research, it should use the variables of environmental education and public mind for environmental conservation in elementary school to reach the green behavior.

Keywords: factors, environmental education, public mind for environmental conservation, green behavior

บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาระดับสิ่งแวดล้อมศึกษา จิตสาธารณะในการอนุรักษ์สิ่งแวดล้อมและพฤติกรรมสีเขียว และเพื่อศึกษาด้วยแพรอิสระสิ่งแวดล้อมศึกษาที่ประกอบด้วย ความรู้และความเข้าใจทางสิ่งแวดล้อม เจตคติทางสิ่งแวดล้อม ความตระหนักรทางสิ่งแวดล้อม ความรับผิดชอบสิ่งแวดล้อม และจิตสาธารณะในการอนุรักษ์สิ่งแวดล้อมที่มีผลต่อตัวแปรตามคือพฤติกรรมสีเขียวของนักเรียนระดับประถมศึกษา ประชารักษ์ คือ นักเรียนชั้นประถมศึกษาปีที่ 4-6 โรงเรียนสาธิตมหาวิทยาลัยมหาสารคาม (ฝ่ายประถม) ปีการศึกษา 2555 จำนวน 275 คนซึ่งเป็นกลุ่มตัวอย่างในการวิจัยครั้งนี้ เครื่องมือที่ใช้ในการวิจัยคือแบบสอบถามในการเก็บรวบรวมข้อมูล การวิเคราะห์ข้อมูลใช้การวิเคราะห์การถดถอยพหุคุณเพื่อทำนายความสัมพันธ์ระหว่างตัวแปรอิสระและตัวแปรตาม ผลการวิจัยพบว่า ระดับสิ่งแวดล้อมศึกษา จิตสาธารณะในการอนุรักษ์สิ่งแวดล้อมและพฤติกรรมสีเขียวอยู่ในระดับมาก นอกจากนี้ตัวแปรอิสระสิ่งแวดล้อมศึกษา ที่ประกอบด้วย ความรู้และความเข้าใจทางสิ่งแวดล้อม เจตคติทางสิ่งแวดล้อม ความตระหนักรทางสิ่งแวดล้อม ความรับผิดชอบสิ่งแวดล้อม

และจิตสาธารณะในการอนุรักษ์สิ่งแวดล้อมมีอิทธิพลต่อพฤติกรรมสีเขียวของนักเรียนระดับประถมศึกษาร้อยละ 84.30 จิตสาธารณะในการอนุรักษ์สิ่งแวดล้อมโดยมีค่านิยมด้านการลดด้อยที่ปรับแก้แล้วท่ากับ 0.843 ข้อเสนอแนะจากการวิจัยนี้คือควรนำปัจจัยสิ่งแวดล้อมศึกษาและการมีจิตสาธารณะเพื่อการอนุรักษ์สิ่งแวดล้อมในโรงเรียนประถมศึกษามาประกอบการเรียนการสอนให้กับนักเรียน

คำสำคัญ: ปัจจัย, สิ่งแวดล้อมศึกษา, จิตสาธารณะในการอนุรักษ์สิ่งแวดล้อม, พฤติกรรมสีเขียว

Introduction

Green-Schools, known internationally as Eco-Schools, is an international environmental education programme, environmental management system and award scheme that promotes and acknowledges long-term, whole school action for the environment. Eco-Schools is operated by the Foundation for Environmental Education (FEE) is a non-government, non-profit organization promoting sustainable development through environmental education. whose main partners include the United Nations Environment Programme (UNEP) and the United Nations Educational, Scientific and Cultural Organization (UNESCO). Eco-Schools aim to empower students to be the change our sustainable world needs by engaging them in fun, action-orientated learning. The Eco-Schools programme provides an integrated system for environmental management of schools based on an ISO 14001/EMAS approach. Each school follows a seven step change process and empowers their young people to lead processes and actions wherever they can. Over time and through commitment to the Eco-Schools seven step process, improvements will be seen in all learning outcomes, attitude and behavior of students and the local community and ultimately the local environment.

The program consists of seven steps that the

school needs to adopt as a methodology. These are Establishment of the Eco-schools Committee, Environmental review, Action Plan, Monitoring and Evaluation, Curriculum Linking, Informing and involving the wider community and Eco-Code (Wikipedia, 2015). The Eco-schools or Green-Schools programme provides the courses covering all six themes that incorporate these themes into the curriculum. The courses also provide useful information, supports and resources to help the school with whatever stage of the programme is at. The daily lectures, field trips and active learning are included into the course (UNEP, 2015). These six themes are litter and waste, energy, water, travel, biodiversity, and global citizenship (Green-School Ireland, 2015). Green-Schools is a themed programme with schools initially focusing on the theme of Litter & Waste, and working through the seven steps for this theme and applying for the Green Flag. Once successful, the school moves onto the Energy theme, and then onto the Water theme, with a new theme introduced after each successful renewal. This links very well with the renewal of the award every two years (Green-Schools Ireland, 2015). Principally, the elementary school should be paid attention on social development process with public mind for environmental

conservation with integration of environmental education based on environmental knowledge and understanding, environmental attitude, environmental awareness, and environmental responsibility. This child are quick learner to understand and imitate the appreciate behaviors to develop self-awareness, self-image, self-esteem, self-control and independence through direct experiences from field learning (Thiengkamol, 2011i; Thiengkamol, 2011j; Thiengkamol, 2012c). Although, their mood or emotion might be swung in relation to events and condition but the moral development might be idealism. On the other hand, they can make a justice of right or wrong (Ketuman, 2007; Thiengkamol, 2012b). Additionally, Thiengkamol pointed that the child is our future expectation with environmental ethics for environmental conservation through daily activities with public mind for family, school, society and country. In order to meet sustainable development, they should pay their attention to have to participate for environmental conservation based on public mind for environmental conservation in school level (Thiengkamol, 2011i; Thiengkamol, 2012b; Thiengkamol, 2012c; Donkonchum et al., 2012a; Gonggool et al., 2012b; Ngarmsang et al., 2012b; Chomputawat et al., 2013b; Kotchakote et al., 2013a).

The elementary school students have characters of active and curios learners. They must be inspired with public mind with suitable activities by out-door learning and training through environmental education process and these must be cultivated through daily perform. Their direct experience will be converted into their permanent behaviors. These activities will push them to have correct environment and natural resource conservation and will

drive them to be a beneficially universal citizen with environmental responsibility for environmental quality for their own generations and next generations. They will become important change agents for world if they gain more knowledge and understanding on the importance of interrelationship among all creatures, therefore, they can make a right decision making and guide them to perform green behaviors in daily living. The green behaviors cover (Thiengkamol, 2011e; Donkonchum, & Thiengkamol, 2012; Gonggool et al., 2012b; Ngarmsang et al., 2012b; Pimdee, et al, 2012b; Phinnarach, et al, 2012a).

Green behavior is a pattern of practice to conserve environment by performing through daily living with concern to take care environment. It regards to consumption behavior, energy conservation behavior, recycling behavior, waste management behavior, traveling behavior and environmental knowledge transferring behavior. Green behavior need to be cultivated for elementary student because they are our future hope to conserve the world (Thiengkamol, 2012b; Donkonchum et al., 2012a; Gonggool et al., 2012b; Kotchakote et al., 2013a; Pimdee, et al, 2012b; Waewthaisong et al., 2012a).

Mahasarakham University Demonstration School (Elementary) should be a leader for developing the student 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 meet sustainable development along with vision of president, Supachai Samappito has launched the green university concept since 2009 with 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. Currently, the university get “Green university award from Universitas Indonesia (UI) by releasing the results of its GreenMetric Ranking of World Universities at the ranked 3rd in Thailand and 74th in the world among 360 universities from 62 countries who took part for the UI GreenMetric World Universities Ranking 2014. This ranking marked the completion of the “Environmentally Friendly” development of MSU Going Green Project (Mahasarakham University, 2015).

Understanding, factors affecting green behavior of students of Mahasarakham University Demonstration School (Elementary), therefore, it should study factors of environmental education and public mind for environmental conservation affecting green behavior of elementary student in order to introduce the appropriately environmental activities into learning course and curriculum to accomplish sustainable development and meet the mission of vision of president. The results would be guidelines for academics to conduct with their intended groups including elementary, high school students, undergraduate, graduate and local people nearby university by using the revealed factors for inspiring them to make them have green behaviors with inspiration of public mind (Thiengkamol, 2011f; Thiengkamol, 2011i; Thiengkamol, 2011j; Thiengkamol, 2012a; Thiengkamol, 2012b; Thiengkamol, 2012c; Donkonchum, & Thiengkamol, 2012; Pimdee, et al, 2012b; Phinnarach, et al, 2012a; Chomputawat et al., 2013b; Kotchakote et al., 2013a).

Objective

1. To study the environmental education level, public mind for environmental conservation level, and green behavior level of elementary school students.
2. To study the independent variables of environmental education in terms of environmental knowledge and understanding, environmental attitude, environmental awareness, environmental responsibility, and public mind for environmental conservation affecting dependent variable of green behavior of elementary school students.

Research Hypothesis

1. The environmental education level, public mind for environmental conservation level, and green behavior level of elementary school students are at moderate levels.
2. The independent variables of environmental education in terms of environmental knowledge and understanding, environmental attitude, environmental awareness, environmental responsibility, and public mind for environmental conservation are affecting dependent variable of green behavior of elementary school students.

Methodology

1. The populations were 274 students of Mahasarakham University Demonstration School (Elementary) in Northeastern region of Thailand in academic year of 2014.
2. The research instrument was the questionnaire and it was used for data collection. The questionnaire

composed of 40 questions with 5 rating scales of environmental knowledge, environmental awareness, environmental attitude, environmental responsibility, public mind for environmental conservation and green behavior. This was applied from different studies of Thiengkamol and her colleagues (Thiengkamol, 2011j; Thiengkamol, 2012a; Thiengkamol, 2012b; Thiengkamol, 2012c; Donkonchum, & Thiengkamol, 2012; Pimdee, et al, 2012b; Phinnarach, et al, 2012a; Chomputawat et al., 2013b; Kotchakote et al., 2013a). The contents and structural validity were determined with Item Objective Congruent (IOC) by 5 experts in the aspects of forest, social science and social research methodology (Rovinelli and Hambleton, 1977). The reliability was done by collecting the sample group from 50 elementary school student of Rajabhat Maha Sarakham University Demonstration School which was the similar characteristic of people and location and they were not sample group. The reliability was determined with Cronbach's Alpha (Cronbach, 1951). The reliability of environmental knowledge, environmental awareness, environmental attitude, environmental participation, public mind for forest conservation and forest conservation. and total questionnaire were 0.912, 0.923, 0.938 and 0.958 respectively.

3. The descriptive statistics used included frequency, percentage, mean and standard deviation. The rating for explanation of levels environmental knowledge, environmental awareness, environmental attitude, environmental responsibility, public mind for forest conservation and forest conservation were starting 0-1.50 as very low level, 1.51-2.50 as low level, 2.51-3.50 as

moderate level, 3.51-4.50 as more level, 4.51-5.00 as most level. The inferential statistics used was Multiple Regression Analysis (Hair et al., 1998) by considering confident interval at 0.05 and 0.01.

Results

1. Results of Environmental Education Level

The results of environmental education level of 275 elementary school students had total mean score at most level with 4.54 while considering on each aspect, it was revealed that the environmental education level comprising of environmental knowledge and understanding level, environmental awareness level, environmental attitude level and environmental responsibility were at most level with 4.55, 4.52, 4.55, and 4.56. Moreover when considering on aspect of environmental knowledge and understanding, the mean score of Use of fossil energy causes global warming was highest level with 4.58 and subsequences were Global warming is due to population growth and Accomplishing the aim of environmental education, it needs to have knowledge transferring with 4.53 and 4.52 respectively. In aspect of environmental awareness, the mean score of Present living needs to realize the ecological balance was highest level with 4.62 and subsequences were the need to know how to valuably use natural resources and Environment is public; therefore we no need to look after with 4.55 and 4.51 respectively. In aspect of environmental attitude, the mean score of the favor to conserve and prevent the environment because it supports you to have a better life quality was highest level with 4.60 and subsequences were the realize the forest

importance because the number of forest has decreased to the critical level and the realize to the environmental value, you will participate for environmental conservation with 4.56 and 4.52 respectively. In aspect of environmental responsibility, the mean score of the living with sufficiency that is a mean to decrease environmental

problems was highest level with 4.63 and subsequences were there is any environmental problem, take a part to participate and the responsibility for environmental campaign on global warming and surrounding rice farm with 4.59 and 4.58 as presented in table 1.

Table 1

Environmental education level

Environmental knowledge and understanding level	μ	σ	Level
1. Environmental education is an important tool to prevent and to solve environmental problems.	4.50	0.71	More
2. Accomplishing the aim of environmental education, it needs to have knowledge transferring.	4.52	0.80	Most
3. Use of fossil energy causes global warming.	4.58	0.64	Most
4. Deforestation is a main cause of global warming.	4.51	0.72	Most
5. Global warming is due to population growth	4.53	0.65	Most
Mean of environmental knowledge and understanding level	4.55	0.764	Most
Environmental awareness level	μ	σ	Level
1. Everyone must aware of the importance of natural resource conservation.	4.49	0.64	More
2. We need to know how to valuably use natural resources.	4.55	0.65	Most
3. Environment is public; therefore we no need to look after.	4.51	0.70	Most
4. Present living needs to realize the ecological balance.	4.62	0.56	Most
5. People must be cultivated to have good consciousness for environment.	4.48	0.60	More
Mean of environmental awareness level	4.52	0.68	Most

Table 1*Environmental education level (Continue)*

Environmental attitude level	μ	σ	Level
1. When you realize to the environmental value, you will participate for environmental conservation.	4.52	0.66	Most
2. When you perceive to value of creatures, you will conserve the other living things.	4.50	0.65	More
3. You favor to conserve and prevent the environment because it supports you to have a better life quality.	4.60	0.60	Most
4. You intend to decrease forest destruction because you want to protect the forest ecology.	4.49	0.94	More
5. You realize the forest importance because the number of forest has decreased to the critical level.	4.56	0.63	Most
Mean of environmental attitude level	4.55	0.70	Most
Environmental responsibility level	μ	σ	Level
1. You take responsibility for environmental campaign on global warming.	4.58	0.65	Most
2. You take responsibility for all forms of environmental conservation.	4.48	0.66	More
3. When there is any environmental problem, you will take a part to participate.	4.59	0.65	Most
4. You gain direct benefit from taking responsibility for environmental problems.	4.48	0.64	More
5. You have living with sufficiency that is a mean to decrease environmental problems.	4.63	0.62	Most
Mean of environmental responsibility level	4.56	0.63	Most
Mean of environmental education level	4.54	0.65	Most

2. Results of Public Mind for Environmental Conservation Level

The findings revealed that public mind for environmental conservation level of 274 elementary school students in holistic view was at most level with 4.55 while considering on each issue, it was revealed that

the wish to be a good model for public devotion was at most level with 4.61 and subsequences were there is a lot forest resource; therefore it is no need to conserve for next generation and the willing to conserve the public environment and property with 4.60 and 4.58 respectively as presented in table 2.

Table 2*Public mind for forest conservation level*

Public mind for environmental conservation level	μ	σ	Level
1. You have an impressive person as you're idle for environmental conservation.	4.50	0.62	More
2. You have an impression to your close friend who express for environmental conservation.	4.54	0.65	Most
3. You wish to be a good model for public devotion.	4.61	0.73	Most
4. You face with impressive event on environmental conservation.	4.53	0.7	Most
5. The last flood event makes you feel good impression for people heals each others.	4.57	0.65	Most
6. Your impression on natural park visiting, it inspires you to conserve the natures.	4.49	0.65	More
7. National parks and natural tourism sites are the impressive environment.	4.50	0.64	Most
8. Environment is public, it is the governmental sector to look after.	4.48	0.67	More
9. There is a lot forest resource; therefore it is no need to conserve for next generation.	4.60	0.66	Most
10. You are willing to conserve the public environment and property.	4.58	0.68	Most
Mean of public mind for environmental conservation level	4.55	0.70	Most

3. Results of Green Behavior Level
 The findings revealed that green behavior level of 274 elementary school students was at most level with 4.51. considering on each issue, it was found that use two pages of paper was at most levels with 4.62

and subsequences were the garbage drops outside the bin, the warn should be done and the participate the forestation campaign because it is a way to decrease global warming with mean scores of 4.60 and 4.55 respectively as presented table 3.

Table 3*Green behavior level*

	Green behavior level	μ	σ	Level
1.	You will check the water tap before leave the rest room.	4.53	1.05	Most
2.	You use the washed dishes to pour the tree.	4.50	0.65	More
3.	When you take a bath, you use the ceiling shower instead of water bowl.	4.52	0.92	Most
4.	While brushing your teeth, you should use a glass instead of direct tap water.	4.54	0.60	Most
5.	You separate the garbage before dropping.	4.48	0.66	More
6.	The food waste should be used for fertilizer making.	4.53	0.86	Most
7.	If you see your friends drop the garbage outside the bin, you will warn them.	4.60	0.60	Most
8.	You use two pages of paper.	4.62	0.60	Most
9.	You cultivate the tree because it gives fresh air and alleviates global warming.	4.48	0.64	More
10.	You participate the forestation campaign because it is a way to decrease global warming.	4.55	0.67	Most
Mean of green behavior level		4.56	0.75	Most

4. Results of Environmental Education and Public Mind Affecting Green Behavior of Elementary School Students

The relationship between independent

variables of environmental education and public mind for environmental conservation affected to green behavior as presented in table 4 and 5.

Table 4

Result analysis prediction power of environmental education and public mind affecting green behavior of elementary school students

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.923 ^a	0.854	0.843	0.189954

a. Predictors: Constant, Environmental Education and Public Mind

b. Dependent Variable: Green Behavior

Table 5

Multiple linear regression analysis between environmental education and public mind affecting to local peoples forest conservation behavior

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	55.514	5	11.702	285.436	0.000 ^a
	Residual	11.075	270	0.041		
	Total	66.589	275			

a. Predictors: Constant, Environmental Education and Public Mind

b. Dependent Variable: Green Behavior

From table 4 and 5 when Multiple Linear Regression was analyzed between independent variable of environmental education and public mind for environmental conservation affecting to dependent variable of green behavior, it was found that regression coefficient equaled to 0.923 (92.30%) and coefficient of R Square was 0.854 (85.40 %) at statistically significant with level of 0.01. After it was adjusted, the coefficient of R Square with power of prediction was 0.834

(84.30%). It might be explained that Environmental Education and Public Mind are able to predict Green Behavior with 84.30%.

5. Results of Environmental Education and Public Mind Affecting Green Behavior of Student

Relationship environmental education and public mind affecting green behavior of elementary school students, the result illustrated in table 6.

Table 6

Relationship between environmental education and public mind affecting green behavior of student

Model	Unstandardized Coefficients			Standardized Coefficients	t	Sig.
	B	Std. Error	Beta			
Constant	-0.215	0.111	-	-.799	0.361	
1	Environmental Knowledge and Understanding	0.213	0.065	0.184	3.657	0.00**
	Environmental Awareness	0.255	0.062	0.174	3.363	0.00**
	Environmental Attitude	0.341	0.057	0.121	4.599	0.00**
	Environmental Responsibility	0.250	0.064	0.210	4.257	0.00**
	Public Mind	0.531	0.056	0.522	12.724	0.00**

a. Dependent Variable: Green Behavior

From table 6, linear regression equation, it was revealed that independent variables of environmental education in terms of environmental knowledge and understanding, Environmental Awareness, Environmental Attitude, Environmental Responsibility,

and public mind affecting dependent variable of green behavior of students with statistically significant at level of 0.01, 0.01, 0.01, 0.01, and 0.01. The equation 1 can be written as the following.

When

y = Green Behavior of Student as

Dependent Variable

a = constant value

b_1 = Coefficient relation of Environmental Knowledge

Handbook of Industrial Health

$b2$ = Coefficient relation of Environmental Awareness

$X2$ = Environmental Awareness as
Independent Variable

b_3 = Coefficient relation of Environmental Attitude

$X3$ = Environmental Attitude as Independent Variable

$b4$ = Coefficient relation of Environmental Responsibility

X4 = Environmental Responsibility as

*b*5 = Coefficient relation of Public Mind for

Forest Conservation

*X5 = Public Mind for Forest Conservation as
Independent Variable*

The prediction equation of relationship of environmental knowledge and understanding, environmental awareness, environmental attitude, environmental responsibility and public mind affected to dependent variable of green behavior of student. It can be explained that public mind for environmental conservation was the most effect to of local people forest conservation behavior with 53.10 percent with statistically significant at level of 0.01. Subsequences were environmental attitude, environmental awareness, environmental responsibility and environmental knowledge and understanding with 34.10, 25.50, 25.00 and 21.30 percents with statistically significant at level of 0.01, 0.01, 0.01 and 0.01 respectively as presented in the following equation 2.

Discussions

The results indicated that environmental responsibility and green behavior were at highest level, and subsequences were public mind for environmental conservation, environmental attitude, environmental knowledge and understanding, environmental awareness, and green behavior were at more levels. However, the prediction equation of relationship of environmental education and public mind for environmental conservation affecting dependent variable of green behavior of elementary school student were revealed that the public mind for environmental conservation was the most effective prediction. This implies that public mind for environmental conservation was the most effective variable that is able to use for altering elementary school student for green behavior with 53.10 percent and subsequence was environmental attitude, therefore people who has more public mind for environmental conservation, they would have a good attitude to practice to conserve environment with proper

knowledge and understanding including taking responsibility with awareness. Therefore if we want to inspire elementary school student to perform green behaviors, they must be inspired to have public mind firstly, then they would practice green behaviors. The results were pertinent to the studies of Donkonchum et al., 2012a; Gonggool et al., 2012b; Ngarmsang et al., 2012b; Udonboon et al., 2012b; Waewthaisong et al., 2012a; Saisunantharom et al., 2013a; Suebsing et al., 2013a; Kotchachote et al., 2013a; Chomputawat et al., 2013b.

Recommendation

It should use the variables of environmental education and public mind for environmental conservation in elementary school to reach the green behavior because they are next generation which is our hope to conserve the world.

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