

Development of Environmental Education Characteristics

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Abstract: Environmental Education Characteristics (EECs) are features for environmental educator or environmental education volunteer should have public mind to serve community and society in terms of awareness and consciousness raising, attitude, belief and behavior changing through knowledge giving activities. The lack of evidence for confirmation of EECs, it needs to employ the experts in environmental education field to validate. Environmental education expert refers to the person who graduated at doctoral degree in the environmental education field or related field and has experience at least 5 years in research or teaching or holding training environmental education program in this field. Environmental education principles cover knowledge and understanding on environmental issues, awareness raising, attitude and behavioral changing including valuating ability, skill development and participation. The objective of this research is to develop EECs. The Delphi technique was employed for data collection from 17 experts with three round opinions of validation EECs. Inter-quartile range between quartile 1 and 3, mean and mode were be used for data analysis. The finding revealed that the characteristics were categorized to be 14 main EECs and 26 supportive EECs by using rating scale according to the most congruent level with mean scores ≥ 4.50 for main EECs and more congruent level with mean scores equal to 3.50 up to 4.49 for supportive EECs. The main EECs were very important characteristics because it would identify environmental educator from general educator. Moreover, it can be used for identify for environmental education volunteer who has public mind for environmental conservation to meet sustainable development.

Key words: Development, environmental education, characteristics, sustainable development

INTRODUCTION

The roots of Environmental Education (EE) can be traced back as early as the 18th century when internationally EE was first recognition when the UN Conference on the Human Environment held in Stockholm, Sweden in 1972 declared EE must be employed as a instrument to emphasize global environmental problems. The United Nations Education Scientific and Cultural Organization (UNESCO) and United Nations Environment Program (UNEP) created three major declarations that have guided the course of EE. The Declaration of the United Nations Conference on the Human Environment or Stockholm Declaration was accept June 16, 1972 by the United Nations at the 21st plenary meeting as the first document in international environmental law to recognize the right to a healthy environment. In 1975, the Belgrade Charter, the outcome of the International workshop on EE held in Belgrade was built upon the Stockholm Declaration and added goals, objectives and guiding principles of environmental education programs. EE should be introduced the general

public. In 1977, the Tbilisi Declaration noted the clear accord in the important role of EE in the preservation and improvement of the global environment as well as in the sound and balanced development of the global communities. The Tbilisi Declaration updated and clarified The Stockholm Declaration and The Belgrade Charter by including new goals, objectives, characteristics and guiding principles of EE (http://en.wikipedia.org/wiki/Environmental_education). It might be concluded that from above conference EE characteristic was stressed on knowledge and understanding, awareness, attitude, skill, evaluation and participation.

In the United States some of the antecedents of EE were Nature Studies, Conservation Education and School Camping. Nature studies integrated academic approach with outdoor exploration (Roth, 1978). Conservation Education brought awareness to the misuse of natural resources. The governmental agencies like the US Forest Service and the Environment Protection Agency (EPA) were also pushing a conservation agenda. Conservation ideals still guide environmental education today. School camping was exposure to the environment and use of

resources outside of the classroom for educational purposes. The legacies of these antecedents are still present in the evolving arena of environmental education (http://en.wikipedia.org/wiki/Environmental_education).

EE practice in the United States is defined by these characteristics that are EE incorporates a human component in exploring environmental problems and their solutions. Therefore, environmental solutions are not only scientific but they include historical, political, economic and cultural perspectives. This also implies that the environment includes buildings, highways and ocean tankers as well as pine trees and coyotes. EE rests on a foundation of knowledge about social and ecological systems. Knowledge lays the groundwork for analyzing environmental problems, resolving conflicts and preventing new problems from arising. EE includes the affective domain: the attitudes, values and commitments necessary to build a sustainable society. The role for educators in addressing the affective domain is not always easy. Educators should make it clear that differing personal values exist that these values can color the facts and that controversy is often motivated by differing value systems. EE includes opportunities to build skills that enhance learners' problem-solving abilities such as:

Communication: Listening, public speaking, persuasive writing, graphic design.

Investigation: Survey design, library research, interviewing, data analysis.

Group process: Leadership, decision making, cooperation (EE Link. Principles of Environmental Education) (<http://www.biologie.uni-hamburg.de/b-online/ibc99/eelink/principlesofenvironmentaleducation.html>).

In Australia, there are prosing principles of EE that included EE must involve everyone because it is a responsibility for everyone, government, industry, the media, educational institutions, community groups as well as individuals, EE must be lifelong whether in formal or non-formal settings. EE must be holistic and about connections, it needs much stronger re-orientation of all relevant areas of formal education towards issues of sustainability is required. Equally important is the need to establish better communicative links between those people working on or learning about similar or related environmental issues but who come from different professional or disciplinary backgrounds. Better grounds for communication and partnerships are also required between formal and non-formal education settings and between various groups with competing interests on environmental issues. EE must be practical and EE must

be in harmony with social and economic goals and accorded equal priority. Similarly, one of the objectives of environmental education is to develop a fundamental acceptance in the community that the nation's environmental objectives should be accorded the same priority as its social and economic objectives (National Action Plan Environment Australia, 2000).

About three decades and a half afterward, the Stockholm Declaration and The Belgrade Charter in 2009, Theingkamol has given by addressing the important characteristics of EE covered knowledge and understanding and awareness and sensitivity about the environment and environmental challenges, attitude concern for the environmental conservation, skills to monitor the environmental problems including knowledge transferring, responsibility taking, skill public consciousness or public mind performing and inspiration raising for environmental conservation. Participation in environmental activities and decision making on environmental problem solving would be stressed including daily practicing until become an environmental habit or behavior by all global citizen. Especially, these characteristics should be introduced through all educational channels whether through the formal, informal, non-formal and lifelong education in order to accomplish a real sustainable development of the world (Thiengkamol, 2009a, 2011d).

Even though in the past, Thailand had promoted, had maintained environmental quality and had tried to solve the environmental problem, there was only governmental sector that took an important part without the participation of all sectors, particularly, the popular participation. However, the main causes, the people are lacking of knowledge and understanding, public consciousness or public mind and attitude to practice themselves toward environment with the realization of their importance to take responsibilities for natural resources and environmental conservation (Thiengkamol, 2011d). Therefore, all sectors of Thai society must turn their interesting to collaborate alleviating the global problem such as flooding, drought and global warming which is the hot issue that global population has taken a notice to these problems including Thai people as well.

The livelihood of human beings depended upon a variety of living things because every living thing in ecological system are interdependent so human is impossible to live alone without regarding to other living whether humans, animals and plants. However, the social and economic development can be developed further, it needs to create the public consciousness or public mind based on good inspiration of environmental educator with perfect EECs to act for others or society or public. Since

at presently, global society has a vigorous competition (Thiengkamol, 2008, 2011d). The materialism of present society was a push pressures for people to be more selfish and to take more advantage from others (Thiengkamol, 2008). Therefore, the serious and continuous regarding on people behavior and public consciousness, the governmental sector had set a measurement of national education management that one of goals of education management is to make the learner to have the moral and social responsibilities in order to make him to be a good member and volunteer for community and society as Thai citizen and global citizen. Mahidol University of Thailand, Faculty of Social Science and Humanity, Environmental Education Program has provided graduate program since 1978 and produced a large number of master degree and doctoral degree in Environmental Education field. Afterward in 2004, Mahasarakham University open project of graduate program of Environmental Science covered Environmental Management and Environmental Education and produced numerous numbers of master degree and doctoral degree of Environmental Education and become under Faculty of Environment and Resource Studies, Mahasarakham University in 2008. For undergraduate student program of Environment Education just opened last academic year 2010 in this faculty. Therefore, Environmental Education program of Faculty of Environment and Resource Studies, Mahasarakham University covers of undergraduate and graduate studies. The student of Environmental Education program whether in which undergraduate or graduate level should clearly understand about environmental education characteristics and they must take important roles in the future to be a leader in the aspect of environment and natural resources conservation that are congruent to the roles and functions for taking responsibility for Thai society in order to accomplish the philosophy that of faculty that the intelligent student should be a leader and living with environmental friend. Therefore, they should have ideal and concept to be congruent to those roles and burdens in the future and then it needs to introduce the environmental education process to develop and create the public consciousness or public mind with the ideal to devote themselves for society in aspect of environment and natural resources conservation.

At present, generally there is teaching by following the principle of environmental education that covered followings as increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and fosters attitudes, motivations and commitments to make informed decisions and take responsible action (UNESCO, 1978;

Thiengkamol, 2005b, 2010, 2011b, c and d; Jansab, 2006). Therefore, it needs to develop EECs to be standards for environmental education teaching and knowledge providing to general society.

Research objective: The objective of this research was to develop environmental education characteristics.

MATERIALS AND METHODS

Delphi technique was employed for data collection from 17 experts with three round opinions of validation EECs. The criteria for experts selection were at least doctoral degree graduate in environmental education program or related field and at least 5 years experience in teaching or training or researching in environmental education field or related field. The 1st round, the open end questionnaire would be sent to 17 experts. After receiving all questionnaires back, content analysis would be employed to list of item. The Likert scale of 5 level started with 1-5 including inter-quartile range between quartile 1 and 3, mean and mode were be used for data analysis. The criteria used to classify were the congruent value not >1.00 and the mean value not <3.5 of full scores with 5 scores. The characteristic with means scores >4.5 with inter-quartile range <1.00 was categorized as main EECs at most congruent level and the characteristic with mean scores >3.5-4.49 with inter-quartile range <1.00 was categorized as supportive EECs at more congruent level. The 3rd round opinion of expert was found that the data were saturated with no change of opinion from 2nd round (Thiengkamol, 2011a).

RESULTS AND DISCUSSION

Delphi technique: The findings revealed that there are 14 main EECs composed of:

- Ability to transfer environmental knowledge
- To stimulate others to realize the importance of environmental conservation
- To have deeply awareness about environment and natural resources
- To have public consciousness for environmental conservation
- To have positive attitude for environmental conservation
- To have value that for environmental conservation be everyone duty
- To have a sensitivity of environmental conservation
- To wish to take a responsibility for environmental conservation

Table 1: Illustration of 14 main EECs

EECs	Mean	Inter-quartile range	Congruent level
Able to transfer environmental knowledge	4.94	0.00	Most
Able to stimulate others to realize the importance of environmental conservation	4.94	0.00	Most
Have deeply awareness about environment and natural resources	4.94	0.00	Most
Have public consciousness for environmental conservation	4.94	0.00	Most
Have positive attitude for environmental conservation	4.94	0.00	Most
Have value that for environmental conservation be everyone duty	4.94	0.00	Most
Have a sensitivity of environmental conservation	4.94	0.00	Most
Wish to take a responsibility for environmental conservation	4.94	0.00	Most
Participate to environmental conservation activities regularly	4.94	0.00	Most
Consistency of self practice for environmental conservation	4.94	0.00	Most
Able to make decision correctly for environmental conservation	4.94	0.00	Most
Must practice as a role model of environmental conservation to public perception	4.94	0.00	Most
Have correct environmental knowledge	4.94	0.00	Most
Understanding to introduce environmental knowledge for others to practice correctly	4.94	0.00	Most

- To participate to environmental conservation activities regularly
- Consistency of self practice for environmental conservation
- Ability to make decision correctly for environmental conservation
- Must practice as a role model of environmental conservation for public perception
- To have correct environmental knowledge
- Understanding to introduce environmental knowledge for others to practice correctly as showed in Table 1

The findings revealed that there are 26 supportive EECs composed of:

- Ability and communication technique, transferring body of environmental knowledge
- To have knowledge and understanding and skill to adjust human behavior
- To have inspiration for public consciousness
- To have knowledge and understanding on compositions and situations of environment from global to local level that are changing all time
- To pay attention to human resource on environmental aspect
- To have a proper value of environmental conservation
- To have ability to define frame for environmental problem solving
- To have skill of knowledge management for environmental problem solving from defining strategies, plan, project to action systemically
- To access and be able to use appropriate technology for environment through various fields and subjects such as law, ecotourism, agriculture, culture and health
- To brave to think and make correct decision for environmental conservation

- To measure, analyze and manage knowledge
- To pay attention to information and situation of environment
- To have an ideal for environmental conservation
- To participate to environmental activities
- To have public mind for environmental conservation
- To be a person who has knowledge and ability
- To have environmental morality and ethics and hold good governance principle
- To pay attention to stakeholders of environmental conservation
- Self practice every day to be habit
- To have skill to solve environmental problems
- To have intention for environmental problem solving
- To have feeling of environmental sound
- To be able to use information and communication technologies
- Ability to do two way communication of knowledge transferring of environmental conservation
- To consider for environmental problem solving as holistic
- To have good relationship as shown in Table 2

Results of 3rd round of expert opinion were the same as 2nd round opinion revealed that there were 14 main EECs and 26 supportive EECs. This implied the opinions of experts were saturated. The main EECs refers very important characteristic of environmental education, even though there is no study before in these characteristics but some of revealed characteristics also are pertinent to Stockholm Declaration such as main EEC in terms of ability to transfer environmental knowledge, to stimulate others to realize the importance of environmental conservation, to have deeply awareness about environment and natural resources, to have a sensitivity of environmental conservation, have positive attitude for environmental conservation and participate to

Table 2: Illustration of 26 supportive EECs

EECs	Mean	Inter-quartile range	Congruent level
Have ability and communication technique, transferring body of environmental knowledge	3.88	0.00	More
Have knowledge and understanding and skill to adjust human behavior	3.82	0.00	More
Have inspiration for public consciousness	3.82	0.00	More
Have knowledge and understanding on compositions and situations of environment from global to local level that are changing all time	3.82	0.00	More
Pay attention to human resource on environmental aspect	3.82	0.25	More
Have a proper value of environmental conservation	3.76	0.00	More
Have ability to define frame for environmental problem solving	3.76	0.25	More
Have skill of knowledge management for environmental problem solving from defining strategies, plan, project to action systemically	3.76	0.25	More
Access and be able to use appropriate technology for environment through various fields and subjects such as law, ecotourism, agriculture, culture and health	3.76	0.25	More
Brave to think and make correct decision for environmental conservation	3.76	0.50	More
To measure, analyze and manage knowledge	3.76	0.50	More
Pay attention to information and situation of environment	3.71	0.00	More
Have an ideal for environmental conservation	3.71	0.25	More
Participate to environmental activities	3.71	0.50	More
Have public mind for environmental conservation	3.71	0.50	More
Be a person who has knowledge and ability	3.71	0.50	More
Have environmental morality and ethics and hold good governance principle	3.71	0.50	More
Pay attention to stakeholders of environmental conservation	3.71	0.50	More
Self practice every day to be habit	3.65	0.50	More
Have ability to evaluate environmental problems correctly	3.65	0.50	More
Have intention for environmental problem solving	3.65	0.50	More
Have feeling of environmental sound	3.65	0.50	More
Be able to use information and communication technologies.	3.65	0.50	More
Able to do two way communication of knowledge transferring of environmental conservation	3.65	0.50	More
Consider for environmental problem solving as holistic	3.65	0.50	More
Have good relationship	3.65	0.50	More

environmental conservation activities regularly. Moreover, other main EECs revealed in this study were congruent to various studies of Thiengkamol (2005a, b, 2010, 2011b, c) such as to have public consciousness, to have value that for environmental conservation be everyone duty, wish to take a responsibility for environmental conservation and consistency of self practice for environmental conservation and concepts of Thiengkamol (2008) such as to have environmental morality and ethics and hold good governance principle and Thiengkamol (2011d) such as to have public consciousness, to have value that for environmental conservation be everyone duty, wish to take a responsibility for environmental conservation and consistency of self practice for environmental conservation, ability to make decision correctly for environmental conservation, must practice as a role model of environmental conservation to public perception, to have correctly for environmental knowledge and understanding to introduce environmental knowledge for others practice correctly.

Some supportive EECs were never mentioned before in the general principle of EE from The Stockholm Declaration, The Belgrade Charter and Tbilisi Declaration such as to have ability and communication technique, transferring body of environmental knowledge, to have inspiration for good public consciousness, to access and

be able to use appropriate technology for environment through various fields and subjects such as law, ecotourism, agriculture, culture and health, to have a leadership in environmental aspect, to have knowledge and understanding on compositions and situations of environment from global to local level that are changing all time, to pay attention to human resource on environmental aspect, to have skill of knowledge management for environmental problem solving from defining strategies, plan, project to action systemically, to devote oneself for environmental conservation, to have intention for environmental problem solving, to brave to think and make correct decision for environmental conservation, self practice every day to be habit to pay attention to information and situation of environment and to have an ideal for environmental conservation, ability to do two way communication of knowledge transferring of environmental conservation, to consider for environmental problem solving as holistic and to have a correct belief of environmental conservation.

CONCLUSION

Some supportive EECs are important to enhance the environmental educator and volunteer to be a specific idol for other people to recognize to appreciate and realize to his or her important role for public consciousness or

public mind to conserve environment and natural resources through goal of EE to accomplish sustainable development by changing human behavior with environmental education process via different channels of education whether with formal, informal, non-formal and lifelong education system. The most important benefit of main and supportive EECs were discovered can be guideline for teaching of undergraduate and graduate program for Thailand or countries as well.

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