

**ENVIRONMENTAL AWARENESS AMONG
SECONDARY STUDENTS IN SELECTED THAI
AND BILINGUAL SCHOOLS IN BANGKOK,
THAILAND: IMPLEMENTATION AND
INTEGRATION OF ENVIRONMENTAL
EDUCATION ISSUES**

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Abstract: The study aimed to assess the environmental awareness level of higher secondary students in selected Thai and Bilingual Programs in both Public and Private Schools in Bangkok to address the extent of the integration of environmental education into the curriculum using the 30-item Children Environmental Attitude and Knowledge Scale (CHEAKS). There were 7002 participants of the survey. Results showed a weak correlation between students' perceived academic achievement and environmental awareness with $r = 0.157$. The total mean score of environmental awareness is 14.48 with $SD = 5.206$. It revealed that students are most aware toward 'Animal' issues and least aware toward 'Water'. It showed that Thai Program Schools have higher awareness than Bilingual Program; likewise, Private Schools have higher environmental awareness than Public Schools. Female has higher awareness level over the male. Environmental awareness level varies significantly (favorably) as students accelerate their grade level. Comparison of environmental awareness as a function of type of school, grade level and gender revealed significant differences, thus, hypothesis was rejected.

Keywords: Environmental Awareness Level, Thai and Bilingual Programs, Public and Private Schools, Children Environmental Attitude and Knowledge Scale

Introduction

Over the past few decades, the world resources (environment) have undergone dramatic changes resulting from accelerated economic and social transformation. Large increases in population, industrial production, advances in science and technology have transformed the earth's natural resource base, as source of material inputs associated with economic activity. Further, as stated in the Sourcebook in Environmental Education for Secondary School Teachers, 1990 that "poverty causes pollution" at the same time "pollution causes poverty". Thus, neglecting the impacts of socio-economic activities and transformations, lead to an irreversible environmental degradation, which eventually endangers the human race

by threatening its survival on planet earth. In Thailand, the rapid economic growth and social development of the country over the years through transformation from agricultural based economy to agro-industrial and industrial-oriented economy, together with the indiscriminate destruction and pollution of previously abundant natural resources, has resulted in the severe deterioration of the country's environment. Thus, the challenge of Thailand and even all over the world is to attain sustainable development through making strategies to balance a more equitable social and economic development with resource and environmental stability.

Hence, efforts should be made to inculcate environmental consciousness or awareness among the masses. This emphasized the need of environmental education among the populations specially the young generations who are facing great roles in achieving the ultimate goal of environmental sustainability. In fact, environmental education is one of the strategies mentioned in attaining sustainable development (Sharma and Tan, 1990). Thus, there is a call for higher authorities, curriculum makers and school administrators to implement environmental education to the students. It is through education that human will be conscious and knowledgeable about the environment and environmental problems and will be motivated to work for that. People will understand and appreciate the complex nature of the environment and the role to be played in managing the environment in an economic development. Effective implementation of environmental management and conservation programs to attain sustainability depends on education, awareness raising and training in the relevant areas. Besides, environmental education is an instrument to increase the environmental awareness of the top policy makers in the government because we cannot deny that decisions and implementations of environmental legislations are political responsibility, so these people and the future leaders need more awareness too.

Certainly, school is the most effective learning environment for children and for everyone and it is one of the responsibilities of any schools over many countries to make every student environmentally literate. However, in Thailand at present, environmental education is not viewed as a separate discipline rather an integral part of the total curricula. It is being integrated to sciences lessons, social studies and culture at school but it is not enough and sometimes it is bias because the possibility of integration might depends on the school administrations to enforce and the teachers' willingness to introduce, incorporate and correlate it with the lesson. Other factors that may affect in the integration are the teaching techniques used by teachers, lack of teaching resources, some teachers even lack the

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necessary trainings and find difficulties to handle the complexity of implementing environmental education, thus, they just ignored this aspect of lesson. As such, the need for studying environmental awareness to secondary students is necessary to know the extent of awareness they possess. It will address the issue on the extent of implementation and integration of environmental education in the existing curriculum. The awareness level of the students` can help in developing effective teaching and learning techniques in environmental education. It will further drive to enforce its implementation in the educational system.

Objectives

To assess and compare the level of environmental awareness of higher secondary students in selected Thai and Bilingual Programs, both in Public and Private schools in Bangkok, Thailand. It further aimed to determine the relationship of perceived academic achievement of students and environmental awareness as well as compare the awareness level as a function of gender and grade level of students.

Literature Review

The landmark report of the World Commission on Environment and Development warned that unless we change many of our lifestyle patterns, the world would face unacceptable levels of environmental damage and human suffering (Conference on Hunger and Poverty, 2007). It further emphasized that poverty is one of the primary source of environmental problem particularly from undeveloped and developing countries. Poverty and population growth are related. As the population increases, poverty line increases to the point that migration to rich and diverse natural resources are what usually happened and practiced by the community in Thailand. In places where people usually flock for living, the environmental quality is quite low due to massive and intensive utilization (Taengthientam, 2000) However, in most cases, economic production systems tend to ignore the environmental impacts because they considered natural resources as free supplies and don't need the cost to maintain its quality. Exclusion of environmental cost makes the product cheaper, thereby increasing the market demand and therefore, resource depletion is increasing faster without restoration (O'Hearn, 1975). These situations simply emphasized the urgent need for change in the pattern of global economic growth to planet's carrying capacity. We need to maintain the equilibrium state between the economic growth and environmental preservation to get the environmental quality required to sustain long-term economic development. Thus, the situation of the country brought some public attention for immediate need to promote awareness and social responsibility to improve Thailand's environmental condition.

Since the situation not only happened in Thailand, but all over the world especially in developing countries, on 1992 the United Nations organized a conference in

Brazil called "Earth Summit" with the main themes on environment and development. This meeting called the attention of the participants on how to make change "future development of the world" that is economically, socially and environmentally sound and sustainable. During this summit, that the Agenda 21 "Sustainable Development focused" was created (Keating, 1993). In respond to the meeting, Thailand promulgated a law B.E 2535 "Enhancement and Conservation of National Environmental Quality Act" that promotes transparency and accountability in reversing the surge of environmental destruction of the country (Laird, 2000). In addition, the 7th National Plan for Socio and Economic Development emphasized the equal importance of environmental conservation and economic growth and it brought a great impact to environmental protection, which answer the 4th National Plan on sustainable economic growth of the country (Tabucanon, 1998) and the 8th National Plan focused on the promotion of effective management to balance the resource utilization and protection programs (Country Paper, MOI). However, due to rapid growth of the population and communities, it was impossible to depend on the government's efforts alone. Government and non-governmental organizations launched projects to enforce and stimulate environmental awareness through education or legislations. Environmental NGOs were becoming more active and some business leaders have taken up the challenge to adopt environmentally friendly techniques in production processes and to promote the adoption of environmental standards in industry and commerce.

Environmental consciousness has rising in the country (Thailand), but not yet to the critical level that community action that could reverse pervasive environmental degradation because majority of the people are not environmentally literate and aware: Only few knew and understand the situation. There was lack of basic knowledge about key environmental issues. Our citizens rely on outdated, incorrect information and common myths when making environmental decisions (Main Street America's View of the Environment in the 1990's, 1998). Besides, some environmental programs could not work efficiently due to lack of work plan, lack of coordination and many others. Thus, environmental education was developed to strengthen and enhance public awareness and participation. It is a procedure in education, training and information dissemination about environmental factors and its surrounding problems and possible solutions (B.E 2540-2544). The 1992 Decree on Administration of the Community Development Department (CDD) emphasized the function of the department to educate people to become self-reliant economically and socially without harming the environment. It was further stressed by O'Hearn of 1975 the crucial need for realizing trade-off decisions between environmental and economic consideration will be emphasized in public education to achieve full environmental protection. He stressed that people should know that a better environmental quality is costly to cover

the damages from production consumption pattern. That corrective action will cost for every undesirable environmental situations exist. Non-formal environmental education was extended even to out of school and underprivileged populations, giving equal opportunities to study, improve their living conditions and somewhat change their attitudes toward the environment (Vichitra Samanasena) and the National Science Center for Education, a division under the Non-Formal Department of the Thailand Ministry of Education played a role in non-formal education curriculum to promote environmental awareness through various interactive education activities and programs and provide updated information on scientific matters (Srisuparee Jantrasilpin). However, these are not enough to accommodate the need of all individuals. There is a right agency believes to be effective in implementation of environmental education.

Environmental education is one of the thrust in colleges and universities. Environmental studies and sciences were established in the early 1970s after the first Earth Day (Strauss, 1996). The number of environmental studies programs continues to rise such as sciences, environmental biology, environmental engineering and technology, etc. However, these specialized programs will be reached only by minority of undergraduates. Students who do not choose environmental courses will miss an opportunity for developing responsible behavior toward human and nature relationships.

Colleges and universities have been challenged by international mandate, the Agenda 21 on Chapter 36, to increase their role in developing environmental awareness and literacy (Agenda 21, 1992). It even called for colleges to implement a general environmental education program to accomplish environmental awareness and literacy through integration in different courses. There are many promising examples of integrating environmental education into already existing courses; however, they do not reach the majority of college students (Coppola, 2000). Besides, as cited in the UNESCO and International Association of Universities of 1986 that are many educational systems, which are ill-equipped in playing its role. This emphasized more responsibilities of higher learning institution to educate future environmental education teachers. There are still many factors that might affect the implementation of this mandate and so with the students' level of environmental awareness.

Environmental awareness is defined as having sensitivity, understanding, and consciousness of the environment and its problems, including human interactions and effects through education. It is also term as ecological consciousness (Envirowiki online, undated). However, there are many factors affecting the level of environmental awareness. A study conducted in India revealed the major factors affecting environmental awareness and environmentally friendly behaviors the mass media (TV, radio, newspaper, etc) which the most influencing factor, traditional media (parents, friends, neighbors, etc), institutional media (education, government

agencies/political leaders) as the least influencing. Other factors were issues on political and exposure on the actual pollution in the environment. It further showed that many people were aware of the present (degrading) condition but they were not willing to change their behaviors toward the environment because they considered it as less important to their other problem, such as food crisis, unemployment and many things. Therefore, environment is less priority in India. If there was environmental awareness program, implementation was also a problem (Hoerisch, 2002). This finding was also supported by another study in Waterville Junior High School, US that showed that their most common source of environmental information was the mass media. It further showed positive correlation of environmental knowledge and behavior between grade levels of the students (Morrison, 2006). Anonymous, 2009 also stressed out that direct exposure to the natural environment was a strong factor in determining individual concerns towards the environment, which also supported the findings of Hoerisch, 2002 above. Thus, direct exposure to environmental conditions does matter (Korhonen and Lappalainen, 2004).

On the other hand, in the study of Schmidt (2007), by conducting survey to undergraduates students enrolled to Environmental subjects and to those who did not enrolled. It revealed that there was an association of environmental education to behaviors and attitudes of students toward the environment. Students enrolled to the environmental course showed higher pro-environmental values or behaviors than to those non-enrolled students. This means that education is important. Further, a case study on environmental awareness conducted in elementary public sub-urban school in Carolina, Puerto Rico through the integration of research and education also showed positive correlation in the academic achievement of science. The more expose to education, the higher the academic achievement and environmental interest of the students (Rivera-Rentas, Vilches, Davila, Rebollo, Rodriguez, Garcia and Seguinot, 2007).

Another study showed significantly the role of education in environmental knowledge and activities of students in Hacettepe University, Turkey. A Pre-Post Test of Environmental Knowledge, conducted to test the effective of the Environmental Education Module, showed positively in favor of the Post Test. It was concluded that education had an impact on the awareness and activities towards environment. The result of the study was also used for developing more environmental modules (Anonymous, 2006). Similar study that brought great impact to the future was conducted to two schools in Amritsar City, India, which revealed that students are highly aware of the degrading condition of the environment and thus they are willing to participate in environmental programs. The result of the study was used as basis for environmental management program of the city (Manmohan and Navdeep, 2006).

Whereas, there are also several studies on environmental awareness that considered the demographic

profile of the respondents such the location of residency, nationality, gender, grade level, work experience, educational specialization, type of schools and many others that have impacts to their awareness and attitudes towards environment.

A study conducted in Jordan considered the demographic profile of the population as major contributing factors to environmental awareness. It showed that awareness among university increases as their year level in education goes higher. Thus, education played major role in the level of environmental awareness. Awareness varies with locations as well gender, where female's awareness exceed over the males, and age showed differences wherein older people had higher environmental awareness (Ziadat, 2009). While in Abu Dhabi, highest environmental awareness was found among youth and the lowest was among the young children. The women were also found to be more aware than men were. The study further revealed that in the influencer group of society, the teachers possess maximum awareness and among occupational group, the fishermen and farmers are the most environmentally aware while the wildlife traders are the least (Nuwais, 2008).

There was also a comparison of environmental awareness and attitudes between teachers and students of secondary schools in India and Iran. Study revealed on the teachers' level that gender, academic qualification and specialization did affect their awareness and attitudes towards the environment. On the students' level, gender had no effect to awareness while type of school management and different classes had influenced in their environmental awareness and attitudes. The study further revealed that the degree of relationship between environmental awareness and environmental attitude is not the same for teachers and students in both countries (Shobeiri, 2005). Another environmental awareness study in selected city of India and Iran was conducted to secondary students only which showed that Indian students with average level of environmental awareness is more than Iranian students while Iranian students with high level of awareness is more than Indian students, thus nationality counts in the awareness level. Gender difference did not affect awareness; however, the type of school management did matter in study (Shobeiri, Omidvar and Prahallada, 2006). In the field of consumers and marketing in Thailand, variations in environmental attitudes revealed while considering their demographic profile because of their exposure of the issues, family background and occupation. This further implied that consumers chose products depending on their needs and ecological concerns and consequences (Jirajariyavech, 2001).

Damages of the environment will continue to accelerate without letting the people aware of its lifetime consequences. However, the level of environmental awareness and attitudes varies and affected by many factors such as media, exposure to environmental conditions, demographic profile of the population and many others. However, it is greatly affected by the

educational system/environmental education. Environmental awareness and literacy can be accomplished for all and to all graduates by requiring environmental education in the general education curriculum in secondary education as mandated in Agenda 21 for at least the awareness will be maximized despite other factors influencing it during the implementation.

Research Methodology

The research is a causal-comparative study that seeks to determine the differences and association of the dependent variable (environmental awareness level of students) and independent variables (type of schools) and three intervening variables (gender, grade level and perceived achievement level) that probably affects the dependent variable.

The study was conducted among all higher secondary students (Mathayom 4 – 6 students) in the selected Thai and Bilingual Program under Private and Public schools in Bangkok. List of secondary schools was obtained from the Ministry of Education (MOE). It utilized multi-stage sampling techniques. Quota sampling was utilized to get the desired number of schools. There were 4 Thai Public Schools, 5 Thai Private, 3 Bilingual Public, and 4 Bilingual Private with a total of 16 sample schools in this study. Thereafter, purposive sampling was used to select the name of schools to represent the samples. Schools were selected according to the area distribution or geographical location and the size of the population of the school. Intact grouping was used to get the sample population in a school. All students from Grade 10 to Grade 12 (Mathayom 4 – 6) of the chosen schools were the respondents of the study. Other consideration of the study aside from the grade level and gender is the perceived academic achievement level of the students. A 30-item questionnaire (Children Environmental Knowledge and Attitude Scale-CHEAKS) was utilized to determine the level of environmental awareness of the students. A pilot study was conducted in Assumption College Rayong to test the reliability of the tool. A permit was obtained from the Ministry of Education to conduct research to selected schools, particularly from the Office of the Basic Education Commission (OBEC) and Office of Private Education Commission (OPEC).

Descriptive statistics was done to determine the demographic profile of the respondents. Further, one-way ANOVA was employed to identify the level of environmental awareness of secondary students between Thai and Bilingual both in Private and Public schools. Post Hoc multiple comparisons of means for variables having significant effect to environmental awareness were done using Fisher's LSD. Spearman Rho correlation coefficient was used to determine the relationship between the perceived academic achievement level and environmental awareness level of the students. To determine the significant predictors of environmental awareness (criterion), stepwise hierarchical regression analysis was done to type of schools, gender, grade level, and perceived

academic achievement as possible predictors (independent variables).

Results and Discussion

The issue on the extent of integration and implementation of environmental education into the curriculum was addressed by determining the level of environmental awareness of students. The study focused on higher secondary students (Mathayom 4 – Mathayom 6). There were 7002 students took part of the survey, of which 52.5% of them are male and 47.5% are female. Population comprised of 38.6% Mathayom 4, 32.5% Mathayom 5 and 28.9% Mathayom 6. Results of the study are as follows:

1. The 30-point scale tool (CHEAKS) has a reliability coefficient of .78 using Cronbach Alpha reliability estimate, which denotes high relationship.

2. Majority of the students (65.7%) perceived their academic achievement as average, followed by good (25.4%), exceptional (5.7%) and below average (3.3%). The survey revealed that the null hypothesis of having no significant relationship between the environmental awareness level and perceived academic achievement of students was rejected because it was significantly correlated according to Spearman Rho Coefficient of Correlation, although the relationship was very weak as shown in 0.193 coefficient alpha. The significant relationship indicates that the higher the academic achievement level of the students the better is the environmental awareness level. However, the relationship detected was very weak because of the contradicting results that good students have higher awareness level than those exceptional one.

3. Comparison in the level of environmental awareness as a function of types of school revealed significant difference between Thai Private Schools, Bilingual Private Schools, Thai Public and Bilingual Private Schools. The results further revealed that Thai Public School has the highest environmental awareness level (M=15.39), followed by Bilingual Private School (M=15.25), Thai Private School (M=14.34) and Bilingual Public School (M=12.66). Thai and Bilingual Schools both Private and Public in Thailand followed one curriculum from the Ministry of Education, i.e. Basic Education Curriculum, B.E 2544 (A.D. 2001) and prior to this, they followed the curriculum B.E. 2521 (Revised 2533) for 10 years, and this curriculum responded to environmental education concept. According to Chaisorn (undated), it was mandated that environmental education should be integrated in any subject areas as much as possible, however, most often teachers are handling subjects without mastering the curriculum, thus, the extent of implementation and integration of environmental education into the curriculum constitute to the differences in environmental awareness of students. In Basic Education Curriculum, B.E. 2544, environmental contents are found in many subject areas like Science, Social studies, religion and culture, and Career and technology from Elementary to Higher Secondary level. However, questions were raised

on how much of the contents are extended to reach the students and applied them to their local environment and whether all students learned from them or not.

4. Comparison between Thai and Bilingual Schools in general revealed significant difference. Students from Thai Schools scored significantly higher (M=15.08; SD=4.830) than those from Bilingual Schools (M=14.18; SD=5.356). Differences could be attributed by teachers' extent of integrating the topics into the lesson and resources used in teaching as well the students' capacity to grasp the lesson. It is believed that Thai teachers could explain very well while teaching and could create many meaningful exercises to apply the concepts using their native language. Students could understand, interact comprehensively during the activities. This is less true of Bilingual Programs adopted in Thailand, which are evident in the difficulties of delivering the lesson in English on the part of the Thai teacher. It is more likely that teachers only impart contents of the curriculum that they are familiar with. Although foreign teachers are now employed to teach English in Science and other subjects but we could not deny the fact that some of them are not mastered on the subjects they are handling. Furthermore, materials and other learning resources in environmental education or in science subjects in English version are very scarce. It is supported by Boonklurb (2001) that even the IPST (Institute for the Promotion of Science and Technology) has the problems in science equipment and materials to facilitate learning and lacks of qualified teachers. However, the finding contradicts with the study of Kaur. R. & Kaur. M. (2009) that English Medium Schools have higher environmental awareness level than Punjabi (Native language) Medium School in India because aside from being in located in the urban areas, it was said that most of the literatures on environmental issues are in English language.

5. Comparison of environmental awareness between Public and Private Schools in general revealed significant difference at 0.05 levels as manifested in the mean score obtained. Private schools scored significantly higher (M=15.07; SD=4.636) than Public Schools (M=13.91; SD=5.643) in six dimensions of environmental awareness. Significant differences are evidently brought by the availability of teaching and learning materials and resources. Private schools are well equipped with the facilities, materials and resources to facilitate learning efficiently and they are having a more convenient learning environment compared with the public schools. Further, students studying in Private schools come from a well to do family and highly educated parents who can inculcate their children about environmental situations on a global level and has all the means to expose their children to different situations through technology. This finding corroborated with the finding of Kaur R. & Kaur M. (2009) that students from private schools have more environmental awareness than students from government schools because of the socio-economic background. It is further corroborated by the study of Duroy (2005) on the

determinants of environmental awareness and behavior that economic affluence has minor direct influence to the awareness among the community. Furthermore, there is a notion that people working in the government agencies/schools are less likely to work hard because they are paid poorly compared to private schools, thus teachers from private schools put more effort in their teaching career to achieve maximum learning of the students because their financial benefits and privileges are well-taken cared by the school. This is supported by the findings of Kaur R. & Kaur M. (2009) that students from semi-government schools have higher environmental awareness than students from government schools because teachers from semi-government work harder to provide better education than those teachers from government schools who work less. Therefore, the hypothesis that there is no significant difference of environmental awareness between Thai and Bilingual program in both public and private schools was rejected.

6. Comparison of environmental awareness among dimensions (4-6 point-scale) revealed that students have the highest awareness level towards 'Animal' scale (M=2.32), followed by 'Energy' (M=2.71), 'General Issues' (M=3.15), 'Pollution' (M=2.50), 'Recycling' (M=2.15) and 'Water' (M=1.66). This finding is corroborated by the study of Nuwais (2008) in Abu Dhabi that people are most concerned toward 'Energy' and 'Water' ranked as the least concern. It further agrees with the finding of Shoebeiri, et.al. (2007) that 'Conservation of Wildlife and Animal Husbandry' ranked second however, it also contradicts because in his finding 'Energy Conservation' ranked as the least. The overall environmental awareness of students revealed low with a mean score of 14.48 and SD=5.206 (Table 1).

Table 1: Mean Score of Environmental Awareness

N	Valid	7002
	Missing	0
Mean		14.48
Std. Deviation		5.206

The mean score is below 50% of the expected score of the test. The vague implementation and integration of environmental education was probably one of the main reasons of the low environmental awareness of students. Unclear environmental education were caused possibly by lack of human resources (highly qualified teachers) who understand, has the skills and willing to extend their knowledge and skills to the students in order to have a meaningful learning towards environmental aspects. It is supported by UNESCO (2000) that achieving successful environmental education to produce fully aware individual is far from realization in Asia and the Pacific countries despite the initiated education programs, laws and regulations, political and institutional initiatives because we lack the human resources with the conceptual understandings and skills required to implement the tasks. Likewise, some teachers are qualified and capable enough

to handle the subject and facilitate environmental education effectively. Yet, they are not willing to put their efforts seriously into teaching and facilitating the learning; they are not willing to extend extra services in organizing activities beyond the classroom setting; they are not resourceful enough in modifying procedures and equipment available to be used for experimental activities. This is supported by the statement of Wheeler (1996) on his Environmental Project in Thailand that most of the Thai teachers used the "chalk and talk" method in classrooms. It was encouraged in his project, that teachers should move away from this method and find different ways to engage students in the learning process: Through application and investigation rather than memorization. Therefore, limiting the lesson within the classroom and textbooks is also limiting the learning, thus higher environmental awareness is far to achieve. Further, collaboration from other teaching staff handling other subjects, which are connected to environmental education, is lacking. As stipulated in the Curriculum B.E 2544, contents about environmental science, management and other environmental issues can be found in subjects like science, social studies, culture, and geography. It was reported by Chaisorn (undated) that teachers lack collaboration from each other on the lesson that they are teaching, and in creating activities to apply the principles they are learning in the class. Most of the cases, lessons are overlapping because teachers did not coordinate and collaborate.

Lack support from the schools' administration is another possible factor. Some environmental projects initiated by teachers and students were probably not supported by the school administration especially out-campus activities. These learning activities (going into the field) are very important to have the deeper understanding and realization of the actual conditions or situations of our environment. Lectures from the classrooms can be boredom, can be taken for granted, and can be forgotten while learning by actual going and doing into the field is more meaningful and beneficial by the students. They would come to realize the importance to save the environment by seeing it through their own eyes and feeling it by themselves. However, activities like these are more costly and risky that is why school administrations maybe do not favor and support them most of the times. Therefore, learning activities are usually limited within the school campus where application of the concepts and principles are also limited. Other possible factors affecting environmental education are the facilities, learning materials and resources especially English version materials. Chancharoen (undated) admitted in her report that Thailand lacks the integrated learning environmental source to support teachers and students.

7. The study revealed that there was a significant difference of environmental awareness level between genders. Female has higher environmental awareness with a mean score of 14.81 (SD=5.252) over their male counterparts with a mean score of 14.18 (SD=5.147). The

results corroborated with the finding of Hassan, Noordin & Sulaiman (2010) that female secondary students have higher awareness level than male students on the study of environmental awareness towards the concept of sustainable development. It further corroborated on the results of the survey conducted to the general public in Abu Dhabi by Nuwais, M. A. (2008) showing that women were found to be more aware than men. However, the result of this study contradicts with Shobeiri, M. (2005) on the study of environmental awareness and attitude of teacher and secondary students in Iran and India that gender has no effect on students' environmental awareness. The same with the study of R. Kaur & M. Kaur (2009) showing that gender was not a factor affecting environmental awareness of students and that they almost have equal environmental awareness level. The significant differences of this finding indicates that female are more knowledgeable despite the fact that they are attending the same classes with the male and more concerned towards environmental issues. Differences could be probably attributed by influences from activities outside the school premises. Therefore, the hypothesis that there is no significant difference of environmental awareness as function of gender was rejected.

8. Analysis of variance of environmental awareness scores significantly different between each grade level. Mathayom 6 (Grade 12) significantly has the highest awareness score ($M=15.52$; $SD=5.066$), followed by Mathayom 5 (Grade 11) with $M=14.69$; $SD=5.053$ and Mathayom 4 (Grade 10) has the lowest awareness score ($M=13.51$; $SD=5.267$). The result indicates that students are learning from their classes every year, which contribute to their awareness level. This study corroborated with the finding of Ziadat (2009) on the study of factors contributing to environmental awareness among people in the third world country showing that awareness of university students had linearly increased from first year to fifth year. This study further suggests that as they accelerate their grade level, they are more exposed to situations that would possibly contribute to their awareness level. This is further supported by the Basic Education Curriculum B.E. 2544 (A.D. 2001) that on higher secondary grade levels (Mathayom 4-6), curriculum emphasizes on the knowledge and competency in science and technology. Science and social science curricula, where environmental education is being integrated are becoming more complex towards higher-grade level that would develop creative thinking and its application to real life situations. Thus, the hypothesis that there is no significant difference in environmental awareness level as a function of grade level was rejected. The higher the grade level the higher is the environmental awareness level of students.

9. Regression analysis revealed out the significant predictors of environmental awareness, namely, perceived academic achievement level, grade level and gender. It was found out that type of school does not hold

significant relationship between environmental awareness of students, thus, it is not a significant predictor.

Conclusion

Environmental awareness of higher secondary students in selected Thai and Bilingual programs in Bangkok, Thailand is low both in private and public schools. Mean score of the test was below the average score. Environmental awareness of students are primarily taken from the schools or classrooms because they spend more time at school learning rather than learning at home (parents), from media technology, from friends and from experiencing the real situations, unless if the surrounding they are living is experiencing environmental problems most of the times, then an individual will be aware about it. However, in general, a large percent of knowledge of young individuals was taken from the teachers, from the lessons and from that learning; they will develop their awareness and positive attitude towards something or towards the environment. Thus, low environmental awareness of students might be due enforcement of implementing and integrating environmental education, in inculcating the young minds of the students about the environmental issues/problems, environmental conservation and management and relating it socio-economic situation of the country and on a global scale. It is also possible that support from the school administration to fully implement the integration of environmental education and including it in the vision and mission of school and even in the vision of the school-based curricula is lacking.

It is believed that these young generations are the hopes of the country and even the world to save our degrading environment, to solve the problems on sustainable development. However, if this trend will continue to happen, producing less environmentally aware graduates every year, then our hopes are just pointless. One could not rely on the hope that these children will be able to save the world successfully. They need to be selecting specialized training on environmental management in the future outside the school premises. It is rare that this will happen. Environmental crisis is directly related to economic stability of the country and the world and if no one will take care of the environmental crisis, the more that the environment will be deteriorated, the worst will be the socio-economic situation of the nation. Future generations have nothing to survive productively. Therefore, the weaker is the management of schools' administration in enforcing environmental education, the poorer is the performance, the less effort will be extended by the teachers to integrate it to the curriculum, less learning and knowledge will be grasp, thus low environmental awareness of the students. Low environmental awareness of individuals, less concern can be expected from them towards the environment, less participation towards environmental management, more environmental exploitation activities, the more it is degraded, sustainable development couldn't be achieved, the poorer is the economy.

Recommendations

In a newly revised Basic Education Core Curriculum B.E. 2551 (A.D. 2008), which has just started to implement this academic year 2010 from Grade 1-10 and will be fully implemented to all grade levels in all schools by 2012. Developing learners in the aspect of awareness towards preservation, protection and conservation of the environment is stipulated as part of the fifth goal of the curriculum. It includes the learners' key competencies for each subject. Detailed of the key indicators for each grade level and all subject has been clearly stated. These indicators reflect the standard of learning. Science, Social studies, religion and culture, and Career and technology subjects, where standard learning of environmental education is integrated has been clearly defined and stated. However, the education system promotes decentralization of authorities to local areas and local educational institutions to participate in curriculum development. They are encourage to build their own curriculum applicable in the local areas, planning the curriculum implementation and improving its quality of implementation and learning process with due consideration of the national requirements and standards by the Basic Education Core Curriculum B.E. 2551. Thus, full implementation and integration of environmental education still rely on the local curriculum developers, schools' administrator and teachers.

Based from the results of the study, recommendations are categorize according to the person's concern.

Curriculum Developers

1. To develop large numbers of learners who are skilled and dedicated environmental citizens, the learners must feel a sense of ownership toward issues needing resolution and a sense of empowerment with respect to helping with that resolution; thus, it is that environmental issues should be addressed in the school-based curricula.
2. Development of the goals of school-based curricula should imply that environmental education must develop skilled problem solvers; thus environmental education integration should itself use a problem solving (inquiry-based) approach.
3. Integration of environmental education in science and social studies and other subjects should consider not only the conservation of our environment but it should be connected to the socio-economic situation of the country and the world; that a quality of human life and a quality of environment is parallel to the concept of "sustainable development".
4. Integration of environmental education should be implemented at a very young age starting from the primary years, thus, developing curricula is accord to the learning capacity of the students.

5. If integration of environmental education to sciences, social studies and other subjects are not effective as expected, it is highly recommended that Environmental Education should be implemented as a separate curriculum particularly for secondary students.

Schools' administration

1. Environmental education should be indicated in the school policy and action plan.
2. Enhancement of self-directed improvement of teachers' awareness toward environmental activities by providing training workshops, seminars and other sorts of professional development.
3. Cooperation and linkages with the stakeholders in school and other environmental agencies for they can provide some helpful learning activities to the teachers and students as well as can help in an easy implementation of environmental projects.
4. Hiring qualified teachers to handle the subjects and other personnel that could help in technical process in experimental activities.
5. Allocate budget for learning resources (books, journals, facilities and equipment and other materials for used for any environmental activities and projects.
6. Physical environment of the school should be decorated to be the learning resource.
7. Continuous support for environmental activities and projects (time, money, permission, etc.).
8. Continuous monitoring and evaluation of the teachers' performance in integrating environmental education against the environmental awareness of students.

Teachers

1. Student-centered and integration instruction using community resource should be used in providing learning activities.
2. Provide more activities (field activities) to develop the desired characteristics of the students and empowerment to launch the environmental projects by themselves.
3. Teachers should extend extra effort and time in organizing various activities to enhance the learning process of environmental education.
4. They should coordinate with other teachers handling subjects with contents concerning environmental issues so that lessons will not be overlapping and they could create and organize together their activities.
5. Resourcefulness is necessary in every endeavor to be successful even if the school does not have the exact facilities or equipment, then modification can be done.

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