



A Proposed Educational Guideline for Environmentally Friendly Growth

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Abstract

The aims of this research were: 1) To study the context of the challenges facing Thailand in the provision of education for enhancing the quality of life that is environmentally friendly with an emphasis on education and awareness of biodiversity; 2) To study and propose educational approaches that raise awareness of biodiversity; 3) To study the results of the use of educational approaches that raise awareness of biodiversity. The research was research and development methodology with three steps. Target groups were school administrators, teacher representatives, and community representatives from all three schools in Bang Rakam district, Phitsanulok Province. The research tools were a guideline for educating and raising awareness about biodiversity, assessment form for good global citizenship in environmental awareness, assessment form of biodiversity awareness. Analyze the data was with mean, standard deviation and content analysis.

Research results summarized as follows: 1) Thailand context still encountering environmentally friendly growth issues in many ways, therefore, was a challenge to create growth on the quality of life that was environmentally friendly; 2) A guideline for environmentally friendly growth gets a process that was a circuit consisting of 11 activities; 3) The results of using the guideline were teachers had lessons raising awareness. Students who used the developed educational guidelines had overall the awareness of biodiversity before study at a moderate level ($\bar{X} = 2.94$, S.D. = 0.55) and after study at a high level ($\bar{X} = 4.22$, S.D. = 0.45). Students who used the developed educational guidelines had overall competency as a global citizen of the environment before study at a moderate level ($\bar{X} = 3.39$, S.D. = 0.62) and after study at a high level ($\bar{X} = 4.22$, S.D. = 0.45).

Keywords: Educational Development, Environmentally Friendly Growth, Biodiversity, Good Global Citizenship, Environmental Awareness

Introduction

Sustainable Development Goals (SDGs), including the restructuring of Thailand-to-Thailand 4.0, as well as national reform issues. It gives priority to the participation of all development partners through Participatory Processes. To jointly define the vision and direction of national development in order to aim for “stability, wealth and sustainability”. Key Strategy 4.4 Green Growth Strategy for Sustainable Development, stating that current resource condition nature and the environment are becoming a major weakness in maintaining production and service bases including the life of Thai people. (National Economic and Social Development Board, 2017, p. Foreword, 13)

The National Education Plan 2017–2036 sets out strategies for developing education under six key strategies that are in line with the 20-year national strategy. In particular, Strategy 5: Educational management



for enhancing the quality of life that is environmentally friendly has the following goals; 5.1 People of all ages are conscious of the environment, have morality, and apply the concept of sufficiency economy philosophy into practice. There are important indicators such as teachers or education personnel Receive training and development in enhancing the quality of life that is more environmentally friendly. Learners at all levels of education show an awareness of the importance of environmentally friendly living; 5.2 Curriculum, learning resources and learning materials that promote quality of life that are environmentally friendly, morality and ethics, and implementation of the concept of the sufficiency economy philosophy. There are important indicators such as educational institutions or educational institutes organizing teaching and learning activities to cultivate morality and ethics, and lead the concept of the sufficiency economy philosophy into practice more (Office of the Education Council, 2017, pp. J-Q). In addition, from the assessment of green school management in Phitsanulok province according to the green school standard criteria of the department of environmental quality promotion of 200 schools. It found that, in the current condition, environmental teaching and learning management characteristics not yet ready for basic teaching. Especially in small schools with a small number of teachers and have a responsibility to teach in many classes. Not yet has the expertise in integrated teaching. Inability to interpolate knowledge of the environment in other subjects. It may also not have a certainly budget for teaching and learning about the environment. Therefore, no activities organized for the conservation of natural resources and the environment. In addition, the school's eco-friendly service is in the area of community engagement and other departments most of the schools do not meet the required criteria. Moreover, cooperation on environmental activities with other agencies and organizations during the past 2 years, less than 50% of the above factors implemented. (Department of Environmental Quality Promotion, 2012) Therefore, to solve this urgent problem, the emphasis should be placed on promoting and pushing for the development of the school to be readily available in the environment, physical, academic and administrative for leading the development of people, communities and countries in the future. The context of Bang Rakam district, Phitsanulok province is a low-lying area, experiencing flooding problems; agricultural crops damaged every year. This has resulted in government policies that focus on solving problems and taking part in solving problems from many sectors, the Bang Rakam model project was born. Using the concept of the civil state to involve people in managing flood and drought areas in conjunction with changing natural ways rather than controlling nature. Building awareness to be a good global citizen in natural resources. It is important to all living things on earth, including humans. Cultivating the new generation to be conscious of the importance of nature, learning the importance of natural resources, learning about the types of natural resources and understand how to efficient manage the remaining natural resources. Therefore, is of great importance nowadays. (Chureiket & Voravarn, 2016)

Lester, Ma, Lee, & Lambert (2006) study about social activism in elementary science education: a science, technology, and society approach to teach global warming. This study examined elementary students' science knowledge and awareness of social activism with regard to an increased greenhouse effect and global warming. The study involved fifth grade students from five elementary schools of varying demographic makeup in a large urban school district in the United States. The study was based on the analysis of students' responses to a writing prompt addressing an increased greenhouse effect and global warming at the beginning of and at the completion of instruction over the school year. The results indicate that students with adequate science knowledge tended to express activism more frequently, and that their expression of activism increased as they gained better science knowledge after the instruction. The results highlight the importance of effective



instruction of this contemporary and controversial issue with K-12 students, so that they come to be aware of this societal problem, take action in solving the problem, and become socially responsible youth and adults.

From the condition of problems and challenges that Thailand is facing with environmental problems. How to organize education to enhance the quality of life, which is environmentally friendly. It is therefore something that should lead to research studies and propose guidelines for educating and raising awareness about biodiversity to learners and communities in the area. Through a collaboration between the Office of the Education Council and Naresuan University to work in a cooperative problem solving and development with the school and the community. In the context of the area, there are specific characteristics of the problem in the area of the Bang Rakam model in order to utilize the actual research that will be applied to improve and develop educational approaches to enhance the quality of life that are environmentally friendly.

Research Objectives

1. To study the context of the challenges facing Thailand in the provision of education for enhancing the quality of life that is environmentally friendly with an emphasis on education and awareness of biodiversity.
2. To study and propose educational approaches that raise awareness of biodiversity.
3. To study the results of the use of educational approaches that raise awareness of biodiversity.

Literature Review

The Sufficiency Economy Philosophy

The Sufficiency Economy Philosophy (SEP) was a philosophy pointing to the way of existence and the conduct of people at all levels, family, at the community level, up to the state level. In both the development of the country's administration to proceed in the middle way. Especially economic development in order to advance towards globalization. Sufficiency means modesty, rationality includes the need for a reasonably healthy immune system, to have any effect, caused by both external and internal changes. This requires knowledge, prudence, and extremely careful in bringing in various academics used in planning and the implementation of every step. At the same time, it must strengthen the mental foundation of the people of the nation. Conduct life with patience, perseverance, wisdom and prudence, to keep balance and ready to support the change quickly and widely, in terms of material, social, environment and culture from the world outside as well. (Isarangun Na Ayutthaya, 2010)

Providing education according to the principle of Sufficiency Economy Philosophy has important goals, which are cultivating children, and youth know how to live a sufficient life, see the value of various resources. Practicing good coexistence with others be generous and share, have an environmental consciousness and value culture, values, identity/Thai identity. Educational management according to the principle of Sufficiency Economy Philosophy carried out in two parts: 1. Educational administration; 2. Management of learners' learning, which consists of interpolation Sufficiency Economy Philosophy in the subject of learning in the classroom, and the application of sufficiency economy principles in organizing activities to promote learner development. (Kaewurai, Wathanathorn, Keatmaneerat, Suwannasri, & Tammasit, 2011, p. 17)

The 20-Year National Strategy

20-Year Thailand National Strategic Plan (2018-2037) (Office of the National Economic and Social Development Board, 2002) has set long-term sustainable national development goals related to guidelines for



developing education to support eco-friendly growth. In the fifth strategy, the strategy of creating growth on the quality of life that is environmentally friendly.

Sustainable Development Goals (SDGs)

Office of the National Economic and Social Development Board (2002, pp. 1-2) noted an important aspect of sustainability that the limits of natural resources and the environment must be taken into account and meet current needs. It must not affect the future and take into account the holistic, and the application of new technology, and knowledge should be constructive, and beneficial, in a consistent and appropriate way.

Sustainable development focused on development that takes into account economic, social and environmental dimensions together. Including promoting careful utilization of local resources. The sustainable development goals directly related to the biodiversity issue.

National Education Plan 2017-2036

National Education Plan 2017-2036 (Office of the Education Council, 2017, pp. 127-171) establish strategies, goals, indicators for developing education to support green growth. In the fifth strategy, education management to enhance the quality of life that are environmentally friendly as follows:

Goal

1. People of all ages are conscious of the environment, have morality and ethics and apply the concept of sufficiency economy philosophy into practice.

Indicators (Related)

2. Percentage of learners of all educational levels exhibited behaviors awareness of the importance of environmentally friendly living increased morality, ethics and application of the philosophy of the sufficiency economy in life.

2.1 Percentage of students who participated in activities/projects that related to enhancing the quality of life that is more environmentally friendly.

3. Percentage of teacher's/education personnel trained/developed in enhancing the quality of life that is more environmentally friendly.

4. The number of educational institutions in the Green School and Green Classroom Project increased.

5. The number of educational establishments in the moral school Project has increased.

Competency as a Global Citizen of the Environment

Oxfam (2015, p. 5) said about education for global citizenship-key elements as defined by Oxfam as in the Table 1.

Table 1 Shows the Composition of the Competency of Education for Global Citizenship

Knowledge and Understanding	Skills	Values and Attitudes
Social justice and equity	Critical and creative thinking	Sense of identify and self-esteem
Identity and diversity	Empathy	Commitment to social justice and equity
Globalisation and interdependence	Self-awareness and reflection	Respect for people and human rights
Sustainable development	Communication	Value diversity
Peace and conflict	Cooperation and conflict resolution	Concern for the environment and commitment to sustainable development
Human rights	Ability to manage complexity and uncertainty	Commitment to participation and inclusion
Power and governance	Informed and reflective action	Belief that people can bring about change

Conceptual Framework

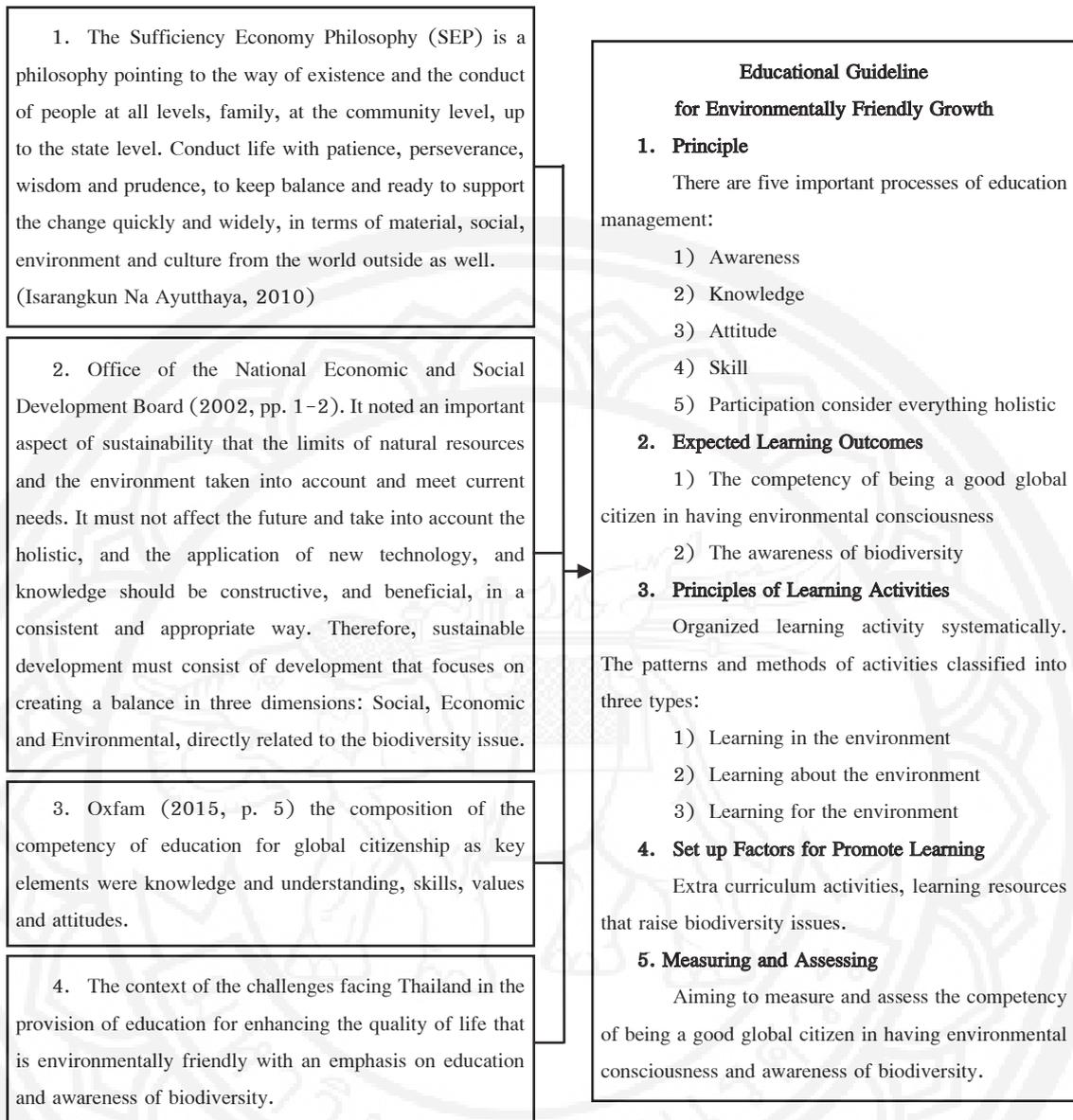


Figure 1 Shows an Educational Guideline for Environmentally Friendly Growth's Conceptual Framework.

Methods and Materials

This research applied research and development methodology, divided into 3 steps of research as follows:

Step 1: Contextual studies related to the challenges facing Thailand in the provision of environmentally friendly education for the quality of life. Its objectives are to study concepts and guidelines for environmentally friendly education. The informants consisted of school administrators from all three schools in the Bang Rakam district, Phitsanulok Province, including Ban Nong Kula School, Wat Promkesorn School, and Bang Rakam Withaya School. Representatives of teachers from all 3 schools that teach in the subject of science learning, social studies religion and culture, career and technology learning group, and community representatives in the Bang Rakam district, Phitsanulok province. The principle of obtaining the sample was that it must be a school in Bang Rakam District, which was directly and indirectly affected by the floods.



The variables studied were 1) Concepts related to the development of education to support green growth and the context of Thailand on education and raising awareness of biodiversity; 2) Guidelines for education that raise awareness about biodiversity and competence in being global citizens who are conscious of the environment.

The process is as follows:

1. Study and analysis of research papers and information on educational development approaches to support green growth in Thailand and abroad.

2. Study concepts related to the development of education to support eco-friendly growth and the context of Thailand regarding education that raises awareness of biodiversity and competence in being global citizens who are conscious of the environment for learners and communities.

3. Collect qualitative data in the study area by focus group with the school administrators, teachers from all 3 schools and local community representatives.

The tools used to collect the data were discussion analysis to determine indicators of good global citizenship competence in environmental consciousness. Guidelines for educating and raising awareness on biodiversity for primary school, secondary and target communities in Bang Rakam District, Phitsanulok Province created by a research team and validated by 5 experts.

Data analysis, including content analysis.

Step 2: Education and presenting an educational approach that raises awareness of biodiversity to students at the primary, secondary and community levels in the Bang Rakam district, Phitsanulok Province. The objective is to create an educational approach that is environmentally friendly.

For content used to create an educational approach, set the content scope according to the core curriculum of basic education, B.E. 2551 (revised version 2017), are as follows: 1.1) Science Learning Substance Group 1, 2, 5, 6, and 8; 1.2) Social Studies, Religion and Cultural Learning Substances 3 and 5; 1.3) Learning, Work, Occupational and Technology Substances Group 1.

The informants consisted of: 2.1) School administrators from all three schools in Bang Rakam district; 2.2) Teachers representatives from all three schools and were in science, social studies religion and culture, occupation and technology learning subject; 2.3) Representatives of the community in the target areas; 2.4) Senior environmental researchers 6 persons; 2.5) Senior researcher in agriculture natural resources and the environment; 2.6) Representatives from the public or private sectors who play an important role in environmental supervision 2 persons.

The variables studied were validity and suitability.

Operated in 2 sub-phases as follows:

Phase 1: Drafting guidelines for providing education including rationale guiding principles in setting objectives, activity, content, and operating procedures in teaching and learning guidelines, objectives, learning subject, learning activities, measurement and evaluation, factors driving success.

Phase 2: Evaluate the draft guidelines; this is to consider and verify the correctness of the educational approach. By discussing the focus group with people who play an important role in providing education according to the developed guidelines. By defining the process 3 times, consisting of:

The first time was a critical brainstorming meeting with a focused on consideration and validation of the guidelines and guidelines for implementing the educational guidelines.



The second time was a critical brainstorming meeting with a focused on considering and verifying the correctness of the guidelines and manuals.

Third time considered and verified the correctness and appropriateness of the guideline and use manual. By expert's natural resources and environment, they conducted in a variety of formats including in-depth interviews, social media interactions, and documents.

The tools used for data collection were discussion analysis to verify their accuracy. Suitability of the approach guide to use guidelines and the learning evaluation tools consisted of 1) The competency as a global citizen of the environment assessment form; 2) An awareness of biodiversity assessment form that examined for the quality of its integrity by five experts.

Data analysis, including content analysis.

Step 3: Study results of the use of educational guidelines. The objective was to experiment and study the results obtained from the use of an environmentally friendly educational approach.

The sample group was three groups of 1) Schools not directly affected by the flood but some of the students in the school were directly affected by the residential flooding. It is one primary school, Ban Nong Kula School and a secondary school, Bang Rakam Witthayasuksa School, Bang Rakam District; 2) Schools directly affected by the flood, 1 primary school level, Wat Phrom Kesorn School, Bang Rakam District; 3) Community in Bang Rakam District, Phitsanulok Province, directly affected by the flood.

The variables consisted of

3.1 Independent variable was learning management using educational management guidelines.

3.2 Dependent variables were

3.2.1 Awareness of Biodiversity.

3.2.2 Good Global Competence in Environmental Consciousness.

Proceed as follows:

1. Held meetings to build knowledge and understanding with stakeholders in each schools. By organizing workshops to provide teachers with ideas, knowledge and practical skills to implement patterns into practice in all three schools, each school has a research team, each as a coach and a mentor of each school.

2. Conducted learning management with the sample group. Using the form of educational guidelines for target learners at the elementary level and secondary. While conducting learning management activities, the research team will visit the area to conduct supervisory processes in each school.

3. Assessed biodiversity awareness; including 1) Raising awareness and educating on biodiversity; 2) Promoting participation in biodiversity management; 3) Conservation restore biodiversity; 4) Protection threat reduction and make sustainable use of biodiversity. Assess competency for good global citizenship in environmental consciousness, namely 1) Knowledge competencies; 2) Skills competencies; 3) Social and collaborative skills competencies; 4) Characteristic competencies. By using the tool, that researcher created assessment validated by administrators, teachers, community representatives and experts.

4. Organized a meeting to transcribe the lesson learn on the implementation of the educational guideline for environmentally friendly growth.

The tools used for data collection were 1) The global good global competency assessment form for environmental consciousness; and 2) Biodiversity awareness assessment. Created by a research team and validated by five experts.



The analysis of the data is mean and standard deviation.

Results

1. Thailand context in many areas, the green growth issue remains ineffective, the management system for enforcing incentives was unable to ensure the cost-effective use of resources. The damaged from climate change and natural disasters continues to exacerbate both floods and drought. The green economy index/sustainability index information system used for management. Law enforcement is still inefficient and fair. More complex and intense international obligations, cases and agreements from social and environmental measures affected competition, trade and investment. So how was it a challenge to grow on an environmentally friendly quality of life?

2. The approach to education has a cyclical process. Emphasis placed on thinking and learning processes to promote environmentally friendly lifestyles. Being aware of biodiversity and have good global citizenship competency in having environmental consciousness. Guidelines for educational management were appropriate and implemented in the form of participation in awareness and implementation together with 11 activities: 1) The meeting communicates the importance, goals and approaches of common development for administrators, teachers, and community and mentor researchers; 2) Study problems and contexts on diversity in the local community to reflect on shared learning; 3) Bring problems and context to brainstorm on important issues in the problem-solving space; 4) Develop educational and awareness-raising guidelines for biodiversity and examine the guidelines developed from stakeholders; 5) Build the understanding of administrators, teachers and the community towards the developed approach; 6) Develop the skills, analysis and design of lessons to raise teachers' awareness of biodiversity; 7) Measure the pre-school basis of students; 8) Teachers organize learning/extracurricular activities according to the model guidelines with the community; 9) Supervisory mentor researchers follow up on the actual performance of the teachers at the school; 10) Measure awareness of biodiversity and competence in being global citizens who are conscious of the environment of students and the community; 11) Organize activities reflecting and removing lessons learn. As shown in the Figure 2.

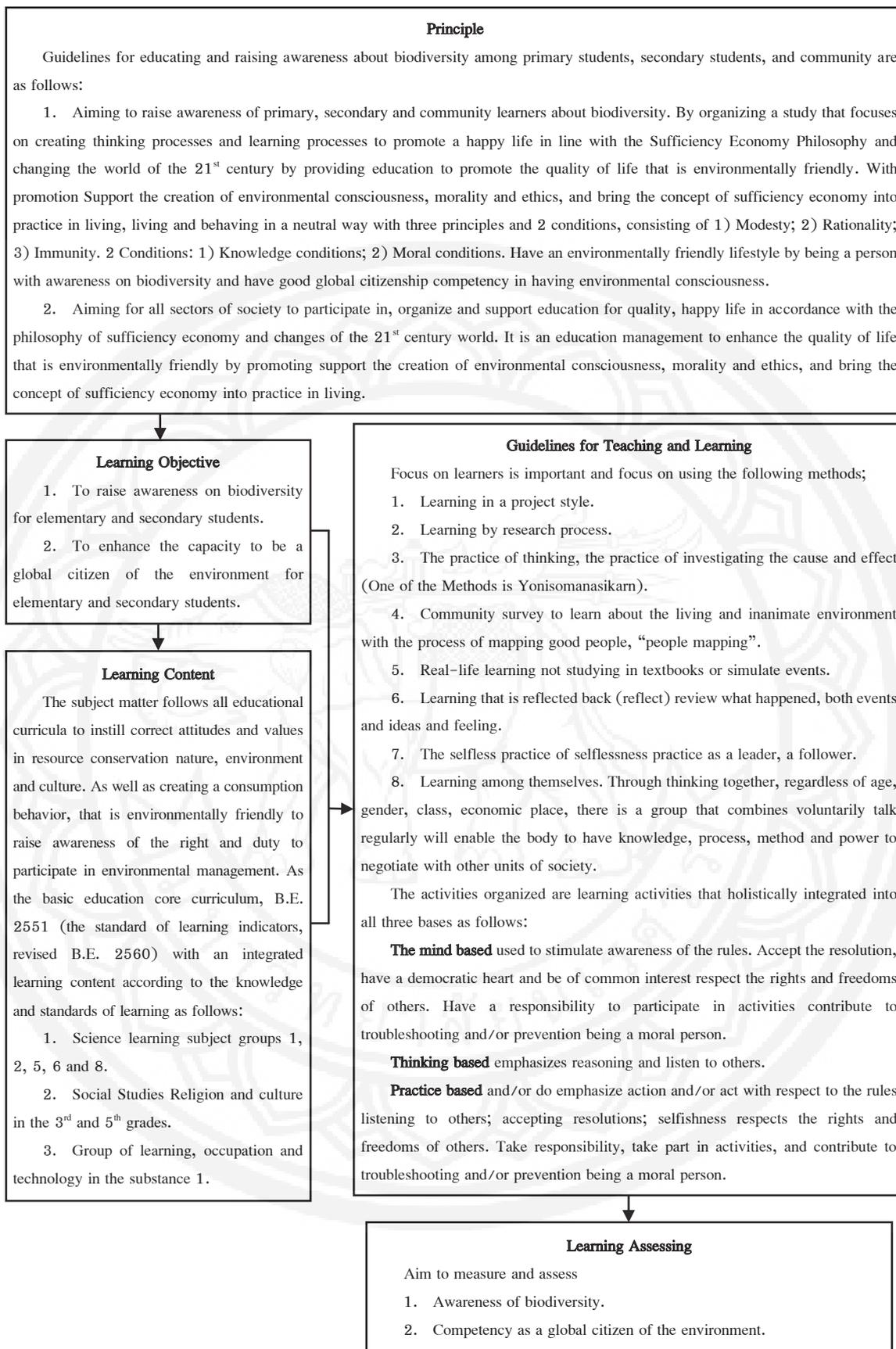


Figure 2 Shows an Educational Guideline for Environmentally Friendly Growth.



3. Results of using an educational guideline for environmentally friendly growth presented as follows:

3.1 Teachers have lessons according to educational guidelines and raise awareness of biodiversity as shown in the Table 2.

Table 2 Shows Examples of Teachers' Work/Lessons According to Educational Guidelines

School Name	Work Title
Wat Phrom Kesorn	Unit 2: Water and Community Way the Moral Project "Water Way of the Community" Integrating Sufficiency Economy Philosophy Mathayomsuksa 1-3; Water and Diversity. Teacher: Mrs. Wannapa Puek-On
Ban Nong Kula	Unit 2: Learning Management: I am the Frustration, Leading the Group, Learning, Work, Occupation Grade 5. Teacher: Miss Chishaphamon Kampha
Bang Rakam Witthayasuksa	Integrated Learning Management Course Subject 30110 Genetics and Environment on Biodiversity for Mathayomsuksa 6 Students. Teachers: Ms. Uthaiwan Sanun

3.2 Analysis results of mean and standard deviation of students and the community' awareness of biodiversity.

Table 3 Shows the Results of the Analysis of Mean and Standard Deviation of the Awareness of Biodiversity

School / Community	Before Study		Level of Awareness	After Study		Level of Awareness
	\bar{X}	S.D.		\bar{X}	S.D.	
Wat Phrom Kesorn	2.84	0.75	Moderate	3.99	0.74	High
Ban Nong Kula	2.34	0.37	Little	4.54	0.26	Very High
Bang Rakam Witthayasuksa	3.64	0.54	High	4.02	0.50	High
Bang Rakam District Community	-	-	-	4.48	0.46	High
Overview	2.94	0.55	Moderate	4.22	0.45	High

From Table 3, it found that students and the community who used the developed educational guidelines had overall the awareness of biodiversity before study at a moderate level ($\bar{X} = 2.94$, S.D. = 0.55) and after study at a high level ($\bar{X} = 4.22$, S.D. = 0.45).

3.3 Analysis results of mean and the standard deviation of students' competency as a global citizen of the environment.

Table 4 Shows the Results of the Analysis of Mean and Standard Deviation of the Competency as a Global Citizen of the Environment

School / Community	Before Study		Level of Competency	After Study		Level of Competency
	\bar{X}	S.D.		\bar{X}	S.D.	
Wat Phrom Kesorn	2.78	0.57	Moderate	4.09	0.56	High
Ban Nong Kula	3.73	0.67	High	4.56	0.17	Very High
Bang Rakam Witthayasuksa	3.66	0.67	High	4.01	0.53	High
Overview	3.39	0.62	Moderate	4.22	0.45	High



From Table 4, it found that students who using the developed educational guidelines had overall competency as a global citizen of the environment before study at a moderate level ($\bar{x} = 3.39$, S.D. = 0.62) and after study at a high level ($\bar{x} = 4.22$, S.D. = 0.45).

Discussion

1. The context of Thailand to develop educational approaches that raise awareness of biodiversity among learners and communities, it must provide opportunities for such individuals to take part and contribute to determining local direction and needs in curriculum development. Consistent with the real lifestyle of both the learners and the local community. This was in line with the office of the National Economic and Social Development Board (2002); it has stated that an important aspect of sustainable development taken into account the limits of natural resources and the environment and meet current needs affect the future, take into account the holistic. The application of new technology and knowledge should be constructive and beneficial, in accordance with local conditions. Therefore, from this context, if participation not focused, it may make the approach of education not successful. Made-to-order but without cooperation.

2. Guidelines for the provision of education provided to learners at the primary, secondary and community levels are appropriate, applicable in the manner of creating a participatory perception and practice together. It consists of principles, objectives, content of learning, guidelines for teaching and learning activities. This resulted in learning according to the objectives of the model raised the competency as a global citizen of the environment and the awareness of biodiversity. Related with Abbas & Singh (2014), who found that high environmental awareness contributes to positive attitudes and environmental responsibility. Therefore, environmental awareness raised.

3. The results of using the educational approach found that 1) The teachers had lessons according to the educational guidelines that were environmentally friendly; 2) Elementary school students and secondary have the competency as a global citizen of the environment after studying with a developed model higher than before studying. In addition; 3) Awareness of biodiversity of students and the community as a whole was at a high level after studying with a developed model higher than before studying. The research results may be due to a developed educational management approach. It integrated into the organization of learning according to the subject matter and learning standards. Create ideas and lifestyles in an environmentally friendly way of growing up; organize learner development activities based on the principles of sustainable development. Create a balance in the development of the three dimensions, economic, social, and environmental dimensions. These related with the learning process that emphasized the learners' practice and learn through social activities practice, and learn through a relationship process through aesthetics, helped all learners can reflect self-change and disaster preparedness consciousness (Jantakoon, Wattanatorn, Kaewurai, & Lincharoen, 2015). In addition, a study based on the analysis of student responses, writing to address the management of the greenhouse effect and global warming problem found that students have enough science knowledge would tend to express more frequently in society, be aware of social problems, join problem solving and become socially responsible youth and adults (Lester et al., 2006). The results mentioned above may be due to the focused of the instructional processes used in the guidelines with the learning in a project style, learning by research process, the practice of thinking, the practice of investigating the cause and effect (Yonisomanasikarn), community survey to learn about the living and inanimate environment with the process of people mapping, real-life learning not studying



in textbooks or simulate events, reflected review, the activities organized are learning activities that holistically integrated into all three bases the mind based, thinking based, and practice based and/or do emphasize action and/or act with respect to the rules listening to others and take responsibility. These was a process of a variety of student-centered activities thereby producing results that enhancing the competency as a global citizen of the environment and awareness of biodiversity of students and the community.

Conclusions and Suggestions

Educational guideline for environmentally friendly growth able to operate in a cooperative manner, jointly and responsibly using a holistic approach. Therefore, sustainable development must consist of development that focused on creating a balance in three dimensions: Social, Economic and Environmental, that directly related to the biodiversity issue.

1. Implementing an environmentally friendly educational approach must aim to raise awareness of biodiversity with using a process of a variety of student-centered activities such as the learning in a project style, learning by research process, the practice of thinking, the practice of investigating the cause and effect (Yonisomanasikarn), people mapping, real-life learning, reflected review, the activities organized are learning activities that holistically integrated into all three bases the mind based, thinking based, and practice based and/or do emphasize action and/or act with respect to the rules listening to others and take responsibility thereby producing results that enhancing the competency as a global citizen of the environment and awareness of biodiversity of students and the community by expanding the application in a variety of groups. Adhere to the educational management principles that focus on thinking and learning processes to enhance a happy life in line with the philosophy of sufficiency economy and changes of the 21st century world.

2. Putting the guideline into practice of schools and teachers should begin with contextual analysis. Analyze environmental issues clearly define development issues and then design lessons aimed at promoting awareness of biodiversity and competency as a global citizen of the environment.

3. There should be research and development of educational approaches that raise awareness of biodiversity. That results in implementation in other affiliated schools, non-formal education, and informal and local education in order to drive sustainability and achieve Sustainable Development Goals (SDGs).

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