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## The Development of Bachelor of Science in Environmental Education Program for Sustainable Development by Integrated Instruction

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**Key words:** Curriculum development, environmental education program, sustainable development, integrated instruction

**Abstract:** The purpose of this research was to development of Bachelor of Science in Environmental Education Program for sustainable development by integrated instruction. The results showed that: The evolution of the course Department of Environmental Education, Faculty of Environment and Resource Studies, Mahasarakham University, There are 2 teaching semesters, consisting of the first and the last semesters. With a normal system registration fee equivalent to 200 baht per credit, tuition fee 4,000 baht. And a special system, 400 baht per credit and 4,000 baht for tuition fees. The duration of graduation is not >6 years with the first course being opened using the bachelor of science program, Department of Environmental Education (New course 2008) must study throughout the program in total of 128 credits. And later the curriculum has improved the Bachelor of Science program. The first environmental education program in 2012 (revised curriculum 2012) must complete 146 courses. And at present, there are improvements in the Bachelor of Science program Environmental Education (revised 2017) which must have completed no less than 149 credits. Due to the evolution of the curriculum, there are more study credits by adjusting and adding the courses. That has integrated learning to comply with the Act National Education National strategy Environmental development plan and environmental law and is learning according to 21st century skills. There are 859 students enrolled, 442 graduates and 411 current students. Bachelor of Science in Environmental Education Program for sustainable development by Integrated Instruction, use the learning set model. Is a flat payment system 12,000 baht per semester. Total number of credits not <138 credits, 23 course sets for 3 academic term each semester, consisting of the first semester, late semester and summer semester.

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## INTRODUCTION

Environmental problems that humans are currently experiencing, whether global warming, garbage problems, flood problems, drought problems, waste water problems, pollution problems, soil quality problems, problem of forest degradation, natural disaster. As well as economic, social and cultural problems which are considered environmental problems that are more severe at all times, affecting the quality of the environment and the quality of life of the people in society. And it is widely accepted that environmental problems arise from human life activities<sup>[1]</sup>. Therefore, solving the problem successfully must start with the human being which is the cause first. And it is extremely necessary that everyone. All both public and private, global, regional, national and local. Should have to participate in the prevention and resolution of environmental problems that occur for this reason, many countries are continuously alert to environmental problems. It can be seen from the study and research of methods to prevent, correct, develop, restore and conserve the environment. Which will be a solution to environmental problems that are effective and sustainable. And solving environmental problems that are considered to be the most effective and leading to sustainable solutions to environmental problems, including education in the system, informal learning about the environment and environmental problems that affects the quality of the environment and the quality of life<sup>[2]</sup>. From the above reason, it causes the term environmental education. Teaching environmental education is an educational process. In order to develop the population to gain knowledge and understanding about the environment to be aware of environmental problems and awareness of the value of natural resources. To develop the human potential of their expertise on the issue and to contribute to solving environmental problems and able to live in harmony with nature<sup>[3]</sup>. It can be seen that environmental education is an educational process that focuses on providing knowledge about physical and social environments, both concrete and abstract. Which causes environmental changes and impacts on humans which will create attitudes, behaviors. And values in the conservation and development of the quality of the environment and the quality of life for oneself and the society as a whole<sup>[4]</sup>.

From the status of the country and the context of various changes that the country is experiencing. Therefore, the determination of the vision of the 12th development plan is still ongoing from the vision of the 11th development plan. In which the external circumstances that contribute to the economic course planning is that the curriculum development is consistent with the direction of the 12th National Economic Development Plan (2017-2021). At present, Thailand is still experiencing the environment and the context of

various changes. That could pose a risk both from within and outside the country such as the current economic independence, challenges of new technology, entering the aging society, the occurrence of severe natural disasters, combined with various circumstances. Both the economy, society, natural resources and environment of the country today which still faces problems in many areas such as productivity problems, the ability to compete, quality education, social inequality, etc. Faculty of Environment and Resource Studies, Mahasarakham University is one department that plays a key role in the university's mission: produce graduates, research, academic services to the community and preserving arts and culture. Approved for undergraduate teaching and learning in 2008 and the first curriculum was revised in 2012. By using the philosophy that graduates in the field of environmental studies are environmental ethics have knowledge and skills in managing environmental education, environmental communication, dissemination of environmental knowledge is an academic in environmental studies, capable of integrating. Analyze environmental problems and changes in environmental societies to convey to the people are aware of the environmental problems that arise and application of knowledge for the benefit of both sides to advance social, environmental and economic sustainability. The course graduates have the knowledge and the profession and has produced more academic. When the situation changes in society, environment and quality improvement Bachelor's Degree according to the standard qualifications framework, it is necessary to improve the Bachelor of Science, Environmental Education Program. For two changes to respond to changes in society, environment and for the development of quality of education as well, for sustainable progress in society, environment and economy.

To enable the curriculum development of the Environmental Education program, Faculty of Environment and Resource Studies, Mahasarakham University is efficient and complies with the higher education standards which the Ministry of Education. Faculty of Environment and Resource Studies, Mahasarakham University currently, there are 3 courses offered for undergraduate and graduate studies. By continuously improving the quality and educational standards. In this regard, in order for the administrators and faculty who are in charge and responsible for creating and improving the curriculum to be informed of the policies and procedures for the improvement of the curriculum to be in accordance with the quality assurance criteria that are the same. Therefore, the Environmental Education Program, Faculty of Environment and Resource Studies, Mahasarakham University, therefore deems appropriate to organize a seminar to develop the curriculum in accordance with the framework of higher

education standards of Mahasarakham University. For the committee of Environmental Education program, Faculty of Environment and Resource Studies committee and the educational committee of Mahasarakham University, Bachelor of Science Environmental Education program. For sustainable development using this integrated teaching considered as one mechanism for creating knowledge understanding to support curriculum assessment in educational institutions that focus on quality of graduates. And to enable the development of students and the creation of desirable graduate characteristics and learning outcomes that occur in learners at the curriculum level including to make the teaching and learning management to students more efficient.

**Objectives:** To development of Bachelor of Science in Environmental Education Program for sustainable development by integrated instruction.

## **MATERIALS AND METHODS**

**Sample:** The research on the development of Bachelor of Science in Environmental Education Program for sustainable development by integrated instruction there are samples or informants used in this research study, consisting of teachers at the Environmental Education program, Special instructor of Environmental Education program, current students and alumni of the bachelor's degree, doctorate degree in Environmental Education program, Faculty of Environment and Resource Studies, Mahasarakham University, 60 people. Which is obtained by voluntary selection.

**Research methods:** Fundamental data analysis and course aim. Study basic information about curriculum development and set course objectives of Bachelor of Science in Environmental Education Program for sustainable development by integrated instruction by studying from relevant documents and research. Organize a meeting of the person responsible for the research project and research participants.

Analyze the content, duties, principles and integrated teaching and learning techniques Bachelor of Science in Environmental Education Program for sustainable development by developing and improving the curriculum from 2008-2017.

Organize a meeting to analyze content, main duties, integrated teaching and learning techniques Bachelor of Science in Environmental Education Program for sustainable development from experts and experts. In which the meeting will interview the informant according to the guidelines and issues specified by conducting an official interview. The interview uses open-ended questions. Is an open interview with unlimited answers to allow the interviewer to be independent. With the question

being about curriculum improvements structure and course suitability appropriateness of curriculum management process, learning plan management promoting basic education, number of credits. Promoting professional talents such as internships, education and field trips field study, proficiency, exam and conducting research projects as well as the quality assurance of luxembourg formula, take notes by recording conversation details, interviews, recording and observing interviews.

The process of developing the Bachelor of Science in Environmental Education Program for sustainable development by analyzing the data from the interview by content analysis. And to classify the data and interpret create a curriculum outline. The course components consist of principles and reasons basic concepts in curriculum development course objectives and course structure define the course content.

Assess and improve the development of Bachelor of Science in Environmental Education Program for sustainable development by integrated instruction.

Summary and report on the results of the development of Bachelor of Science in Environmental Education Program for sustainable development by integrated instruction.

Monitoring and evaluation of the development of Bachelor of Science in Environmental Education Program for sustainable development by integrated instruction.

Criticize the curriculum and development of Bachelor of Science in Environmental Education Program for sustainable development by integrated instruction. Use the analysis results to synthesize the data consider the course improvement based on suggestions from current and graduate students, luminaries and expert. Conduct a course review and improve the curriculum to be developed according to the recommendations of experts in each issue. The person in charge of the curriculum makes a Bachelor of Science in Environmental Education Program for sustainable development by integrated instruction, revised Version 2022.

Summary of development of Bachelor of Science in Environmental Education Program for sustainable development by integrated instruction.

## **RESULTS**

**Course evolution:** Environmental Education program, Faculty of Environment and Resource Studies, Mahasarakham university has the opening of the course is 2 semesters consisting of the first and the final semester by the credits must be collected in accordance with the number of courses. There is a normal system registration fee. 200 baht per credit, 4,000 baht for study fees and 400 baht for special systems and 4,000 baht for tuition fees. Which has a duration of graduation not over 6 years by

the course is opened for the first time using Bachelor of Science Program, Environmental Education program (new course 2008) must study throughout the program in total 128 credits and later the course has improved Bachelor of Science Program, Environmental Education program for the first time in the year 2012 (Revised curriculum 2012). Must study throughout the curriculum in 146 credits and currently has updated Bachelor of Science program, Environmental Education program (Updated 2017) which is required to study no less than 149 credits. From the evolution of the curriculum, there are additional study credits by adjusting and adding courses. That has integrated learning to comply with the Act National Education, National Strategy Environmental and legal development plans, learn skills based on 21st century skills according to objectives Bachelor of Science, Environmental Education program was established to produce graduates with qualifications to have knowledge and skills in problem solving criticism and application of local knowledge and knowledge in solving and improving environmental quality have leadership qualities in creative thinking and have skills in organizing education and disseminating environmental knowledge in management appropriately to local conditions and with morality, ethics and professional ethics as well as knowledge, understanding, awareness and behaviors that are environmentally friendly. Resulting in more interested students wanting to study at the bachelor degree level There are 859 students enrolled, 442 graduates and 411 current students.

Bachelor of Science Program, Environmental Education program for sustainable development using integrated teaching Bachelor of Science Program, Environmental Education program for sustainable development using integrated teaching use the learning set model. Which the duration of graduation is not >5 years is a flat payment system 12,000 baht per trimester for a total of 138 credits, 23 courses per semester, 3 semester each semester provides the first part (June-October), the final part (October-February) and the summer season (February-June), the date and time of the course is Monday-Friday and Saturday-Sunday. The objective of the course is: Knowledge in both theory and practical have academic skills able to apply knowledge to real life situations and can create work that is beneficial to oneself and society both at the local and international levels; have volunteer environment environmental ethics, attitude, attitude, awareness, participation in solving environmental problems and have behavior that is environmentally friendly; communication skills and the dissemination of environmental knowledge appropriate to the local community environment. The knowledge and skills to solve problems, analyze, synthesize and be able to apply local knowledge and knowledge to solve and develop environmental quality. The qualifications of the students

are high school graduates or equivalent. That have the qualifications according to the Mahasarakham University's Regulations on Undergraduate Education B.E. 2557, Section 3, Section 11 and in accordance with the announcements of Mahasarakham University regarding the entrance examination for undergraduate studies which will be announced annually and those with environmental qualifications for at least 3 years as per the opinion of the program committee which will be specified in the announcement at the time of the entrance examination for further study.

## **DISCUSSION**

The evolution of the course Department of Environmental Education, Faculty of Environment and Resource Studies, Mahasarakham university has opened the course into 2 semesters. Consisting of the first and the last semesters. In which the credits must be collected in the amount specified by the course with a normal system registration fee equivalent to 200 baht per credit. The tuition fee is 4,000 baht and the special system is 400 baht per credit and has a 4,000 baht tuition fee. Which the duration of graduation is not >6 years. The course is opened for the first time using the Bachelor of Science program. Department of Environmental Education (new course 2008) must study throughout the program in total of 128 credits. And later the curriculum has improved the Bachelor of Science Program, first Environmental Education Program in 2012 (revised curriculum 2012). Must study the entire course, 146 credits. And currently there is an improvement to the Bachelor of Science Program Environmental Education (revised 2017) which must have completed no less than 149 credits. Due to the evolution of the curriculum, there are increasing study credits by adjusting and adding teaching courses that are integrated to comply with the national education act., national strategy, environmental development plan and environmental law. And is learning according to the skills of the 21st century as according to the objectives of the Bachelor of Science Program Department of Environmental Education. Set up to produce graduates with qualifications to have knowledge and problem solving skills. Critical analysis and able to apply local knowledge and knowledge in solving and developing environmental quality. Have leadership qualities in creative thinking and have skills in education management. Disseminate environmental knowledge in management appropriate to local conditions. Have morals, ethics and professional ethics. As well as knowledge, understanding, awareness and behaviors that are environmentally friendly. Resulting in more students interested in studying at the bachelor degree level. There are 859 students enrolled, 442 graduates and 411 current students. This is consistent with the concept by

Woraphong<sup>[4]</sup> have discussed the principles of environmental education in the development of environmentally sustainable. By bringing the environment into teaching and learning management. Even in schools from elementary school level. So that, the environment can be accessed at the educational level of every school. To lead to the integration of new teaching and learning management. To create learning processes for learners at all levels of the school. And if integrated integration can be done. Will maximize benefits to changes in the environment and contribute to sustainable environmental development. In with the concept of the Office of the National Economic and Social Development Board Office of the Prime Minister. The 12th National Economic and Social Development Plan is intended to be used as a guideline for national development to solve economic and social problems in Thailand. The 12th National Development Plan, based on the 20 year national strategy (2017-2036) with the key principles of the 12th National Development Plan. Consisting of: Adherence to philosophy "Sufficiency Economy"; based on "people-centered development"; "Vision under the 20 Year National Strategy" into the framework of Thailand's vision in the 12th National Development Plan. "Thailand Future Objectives 2036" as the framework for setting goals to achieve in 5 years first. And targets at the lower levels. Coupled with a sustainable goal framework and adheres to the principles of action to achieve real results in 5 years. In with the concept of the Office of Natural Resources and Environmental Policy and Planning Ministry of Natural Resources and Environment. The Environmental Quality Management Plan 2017-2021 brought the speech of His Majesty King Bhumibol Adulyadej. And the philosophy of the sufficiency economy. As a guideline for managing natural resources and the environment. So that, all relevant sectors are aware of the use of natural resources and the environment carefully. Adhere to the academic principles, be reasonable, be modest accurate, appropriate and fair. To build immunity for the natural resource base and preserve the quality of the environment. By focusing on the real benefits for the nation at present and in the future. Also, used as a way to balance the conservation and use of natural resources and the environment. By using local knowledge in making decisions. And the integration of natural resources and environment management that is integrated with economic and social development. Which will lead to a balanced and sustainable development of the country. Consistent with the concept of Chaiwat Sutthirat (2016:website) Said that the rapid progress in Information and Communication Technology (ICT) makes the skills necessary for people in the 21st century to be different from the 20th century. Due to the work that used to work with machines is continuously changing. Because computers and telecommunications technology have

expanded capabilities until they can work instead of people. And consistent with the concept of Wongyai<sup>[5]</sup> said that evaluation of the curriculum is an important step in the development of the curriculum to see defects or errors that may be caused by various factors and factors. Such as curriculum design may not be suitable for the needs of individuals and social contexts. The course evaluation can be done at various stages. From the course evaluation before applying the curriculum. Assessment during the course implementation and course evaluation after the course has been completed. And Oliva and Gordon which states that the content of the course curriculum must pay attention to the context of the learners and the needs of the society in which the learners live. The curriculum design and team working group must have a meeting to find the appropriate agreement and conclusion about how to organize various courses to meet the student's true needs. In accordance with the research of Pichitra Tisuka and SuthepUamcharoen<sup>[6]</sup>, the study of the development of the instructional model by using research as the base course development for teacher student. It was found that from the experiment, using the instructional model by using research as base course development for teacher student. The teacher student in the teaching profession as a whole agreed in a high level in all aspects. As for the content that the students agreed with the highest level is to use questions to stimulate learners to create knowledge by themselves. The second is the promotion of self-learning plan. Consistent with the research by Phromtha and Kumwattana<sup>[7]</sup>. Conducted a thesis synthesis on local curriculum development in Thailand. The study found that local curriculum development includes forms of local curriculum is the adjustment of content or learning and teaching activities in an existing course or developing a new local curriculum. The course content is about local careers. And in accordance with the research by Punnarworn and Pusara<sup>[8]</sup> conducted a study on the curriculum development of good citizenship for youth. The results showed that the development of a good citizenship training course for youth and the monitoring of the effectiveness of a good citizenship training course for youth. It is a course created to develop the characteristics of youth citizenship in 6 areas: responsibility, democratic characteristics, morality, self-discipline, ability to adapt and being Thai. Consistent with the research by Butsipha *et al.*<sup>[9]</sup> has studied the development of information systems for curriculum information management. Sakon Nakhon Rajabhat University. The results showed that the development of information systems for curriculum information management resulted in information systems that could be managed. And presenting relevant information related to the courses as follows: record of course details, course teacher, automatic course coding and summarize various

statistics. And the report on the quality of the course. Consistent with the research of Ha and Jongkonklang<sup>[10]</sup> has studied research on learning skills in the 21st century of upper secondary school students. GaoBung province, Vietnam. The research found that the way to enhance learning skills in the 21st century is learning management that focuses on both theory and practice. Practice creativity and problem solving. Training or competition should be provided regarding learning skills in the 21st century. Giving students the opportunity to take action. Consistent with the research of Inthasing *et al.*<sup>[11]</sup>. Criticism of the course in the Master of Education, Teaching and Learning Technology Program, Chiang Mai University under with 3 frameworks which are value, quality and benefits. The research found that the courses in all 15 courses have value, quality and overall benefits at a high level. In addition, experts comment further that statistics courses should be added for research and data analysis. Modify study plans, so, students can choose to do a thesis or independent study. To meet the needs of society and learners in the 21st century that focus on research-based learning. And in accordance with the research by Chaiso *et al.*<sup>[12]</sup> to study, evaluate and develop the Doctor of Education curriculum. Educational Research and Assessment Program, Faculty of Education, Kasetsart University. Found that the evaluation of the suitability of factors in implementing the curriculum. Current students currently studying in the Doctor of Philosophy Program in Educational Research and Assessment (Curriculum Update 2011). Faculty of Education, Kasetsart University and graduates. Assessed the curriculum appropriately for both the structure of the curriculum and the courses organized according to the structure of the curriculum. Students and graduates are satisfied with the course structure and courses organized according to the curriculum structure. And defining feature of the study. And suitable for orientation issues. Promotion of learning foundation and organizing study plans.

Bachelor of Science Program Environmental Education for Sustainable Development by using integrated teaching.

Bachelor of Science Program Environmental Education for Sustainable Development by using integrated teaching. Use the learning set model. Total credits of no less than 138 credits, 23 sets of subjects. Each academic year consists of 3 semesters consisting of the first semester, final semester and summer semester. In order to integrate teaching and learning in accordance with the National Education Act (Version 4) B.E. 2562, Section 32/1, Ministry of Higher Education Science, Research and Innovation. Has the authority to promote, support and supervise higher education, science, research and innovation. To enable the country to keep up with the changes in the world and other civil servants as required by law to be the authority of the Ministry of Higher

Education, Science, Research and Innovation or government agencies under the Ministry of Higher Education, Science, Research and Innovation. To enable graduates with quality education to be able to protect the environment sustainably. Which is in the concept of Sirimai<sup>[13]</sup> said that integrated teaching and learning refers to teaching techniques, focusing on the interests, abilities and needs of students. By combining course content in various aspects relative. Is to create concepts in the students and can also use concepts to create principles for solving problems. Siripat Jesadaviroj (2019 Website) said that the integrated learning management. It is a teaching that connects knowledge. Concept or skills together. To achieve holistic learning both cognitive range, mental range and skill range. This is consistent with the research by Rungruang *et al.*<sup>[14]</sup> studied the development of Thai history curriculum in an international curriculum at the basic education level. The research found that Thai history courses in international programs. Basic education level consists of 7 elements which are:

- Basic information for curriculum development
- Course description
- Standards indicators and learning outcomes
- Curriculum structure
- Learning management process
- Media and learning resources
- Measurement and evaluation

This is consistent with the research by Pechrasuwan and Pusara<sup>[15]</sup> studying the development of vocational courses. Business computer fields as required by the establishment by using backward design. The research found that the developed curriculum consists of a vision, principles, goals, desirable characteristics, the structure of syllabus, course content, teaching activities and measurement and evaluation. By focusing on desirable features five areas: ethics, knowledge, intellectual skills, interpersonal skills and numerical analysis skills. The course structure consists of fundamental course, no <22 credits, focusing on Foreign language courses, 8-12 credits, mathematical and science group 6-12 credits, humanities group 3-9 credits, social sciences courses 3-9 credits. Vocational courses no <52 credits, core courses no <15 credits, required vocational courses no <28 credits, Elective course no <9 credits, not <6 credits of free elective courses and extra-curricular activities (not <120 h). Total courses not <80-90 credits. The results of the feasibility assessment are consistent with the professional qualifications framework. The need for quality workforce of the establishment and suitable for the current situation. Consistent with the research by Sengmanee<sup>[16]</sup> studied academic perspectives of Rambhai Barni Rajabhat University towards the integrated marketing communication teaching and learning. The

results of the research are as follows: The content of the courses that scholars look at in the past, present and in the future are talking about various tools of IMC. The learning process about integrated marketing communications. Marketing communication tools will help each other. The strengths of one media are used to compensate for the weaknesses of another media.

Using contextual tools can make the tool fully available. The teaching and learning process of integrated marketing communication for the benefit of students. Scholars believe that students learn by themselves will benefit.

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### **CONCLUSION**

The date and time of the course operation is Monday-Friday and Saturday-Sunday. The qualifications of the students are high school graduates or equivalent and is a person who has environmental experience qualifications according to the opinion of the curriculum committee. Which will be specified in the announcement at the time of the entrance examination for further study.

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