INTEGRATION OF ENVIRONMENTAL EDUCATION FOR TEACHERS IN BASIC EDUCATION SCHOOLS

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INTEGRATION OF ENVIRONMENTAL EDUCATION FOR TEACHERS IN BASIC EDUCATION SCHOOLS

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ABSTRACT

The objective of the research was to design and evaluate a model of integration of environmental education with academic groups for teachers in basic education. There were four procedures: 1) environmental study related to the local environment of the schools and community, integration of learning management and student learning of environmental education; 2) design of a model of integration of environmental education with academic groups; 3) activity of environmental education for teachers in basic education; 4) evaluation of the efficiency of the model. Data were collected from 32 teachers teaching in basic education at 11 schools: (8 primary schools and 3 secondary schools) by using a questionnaire, evaluation form and in-depth interview.

The research findings correlating to these procedures showed that: 1) environmental education in academic groups had not been undertaken previously in the schools; 2) the model of integration of environmental consultation with academic groups was composed of the main contents related to environment of school and communities, environmental education integrated learning management and academic groups. 3) the teachers gained a knowledge of environmental education and integration from the activity of environmental education such that they were able to write an integration of environmental education plan for academic groups; 4) the model had a high efficiency at a statistical significance of 0.05. Teachers were able to integrate environmental education with the academic groups efficiently. Students improved their knowledge of both environmental education and academic groups. Mean scores of environmental education were higher than before learning and scores in academic groups were very good.

Recommendations are that learning achievement should be evaluated in relation to environmental education for sustainable development and that students and teachers be given opportunities for more participation related to environmental education in schools.

KEY WORDS: INTEGRATED LERANING MANAGEMENT/
ENVIRONMENTAL EDUCATION/ BASIC EDUCATION SCHOOL

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การบูรณาการสิ่งแวดล้อมศึกษาสำหรับครูในโรงเรียนระดับการศึกษาขั้นพื้นฐาน
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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อสร้างและประเมินประสิทธิภาพรูปแบบการบูรณาการสิ่งแวดล้อมศึกษากับกลุ่มสาระการเรียนรู้ สำหรับครูในโรงเรียนระดับการศึกษาขั้นพื้นฐานประกอบด้วย วิธีการดำเนินการวิจัย4 ขั้นตอน ขั้นตอนแรก การศึกษาสิ่งแวดล้อมในโรงเรียนและชุมชน การจัดการเรียนรู้แบบบูรณาการ และการเรียนรู้ของนักเรียนเกี่ยวกับสิ่งแวดล้อมศึกษา ขั้นตอนสองการสร้างรูปแบบ การบูรณาการสิ่งแวดล้อมศึกษากับกลุ่มสาระการเรียนรู้ ขั้นตอนสามการจัดกิจกรรมสิ่งแวดล้อมศึกษาให้แก่ครู และขั้นตอนสุดท้าย การประเมินประสิทธิภาพรูปแบบการบูรณาการสิ่งแวดล้อมศึกษากับกลุ่มสาระการเรียนรู้ซึ่งได้รวบรวมข้อมูลจากครู จำนวน 32 คน ด้วยการสุ่มแบบเจาะจง ทั้งนี้ได้คัดเลือกครูจาก โรงเรียนจำนวน 11โรง ได้แก่ โรงเรียนระดับประถมศึกษา จำนวน 8 โรง และ โรงเรียนมัธยมศึกษาจำนวน 3 โรง โดยใช้แบบสอบถาม แบบประเมินประสิทธิภาพ และการสัมภาษณ์เชิงลึก

ผลการวิจัยประกอบด้วย 4 ประการ ได้แก่ ประการแรก การศึกษาข้อมูลเบื้องต้น เกี่ยวกับการจัดการเรียนรู้แบบบูรณาการพบว่า โรงเรียนส่วนใหญ่ไม่ได้นำสิ่งแวดล้อมศึกษาเข้ามาบูรณาการกับกลุ่มสาระการเรียนรู้ ประการสอง การสร้างรูปแบบการบูรณาการสิ่งแวดล้อมศึกษากับกลุ่มสาระการเรียนรู้พบว่า รูปแบบดังกล่าวประกอบด้วยเนื้อหาหลักเกี่ยวกับสิ่งแวดล้อมในโรงเรียนและชุมชน สิ่งแวดล้อมศึกษา การจัดการเรียนรู้แบบบูรณาการ และกลุ่มสาระการเรียนรู้ ประการสาม การจัดกิจกรรมสิ่งแวดล้อมศึกษา พบว่า ครูมีความรู้เกี่ยวกับสิ่งแวดล้อมศึกษาและการบูรณาการซึ่งสามารถเขียนบูรณาการสิ่งแวดล้อมศึกษากับกลุ่มสาระการเรียนรู้ได้ และประการสุดท้าย การประเมินประสิทธิภาพรูปแบบการบูรณาการสิ่งแวดล้อมศึกษากับกลุ่มสาระการเรียนรู้ พบว่ารูปแบบดังกล่าวมีประสิทธิภาพสูงทำให้คะแนนเฉลี่ยผลสัมฤทธิ์ด้านสิ่งแวดล้อมศึกษาของครูและนักเรียนก่อนและหลังการจัดกิจกรรมสิ่งแวดล้อมศึกษา มีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 นอกจากนี้ยังพบว่า ผลสัมฤทธิ์ทางการเรียนรู้ของนักเรียนตามกลุ่มสาระเพิ่มขึ้นอยู่ในระดับดีมาก

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CHAPTER I
INTRODUCTION

1.1 Rationale and Justification

Science and technical advancement in the modern world have accelerated changes in Thailand and also created numerous effects and problems in both the economy and politics. The decline of culture and morality together with improper educational processes have failed to prepare people for those changes. Because most people are lacking skill in creative thinking and unable to lead effective lifestyle, social problems may happen in every levels, starting wit the personal level to family, community and national problems (Ministry of Education, 2004: 1-2).

Those problems have lead to educational revolution, aiming to develop qualified individuals suitable for developing Thai society and keeping up with worldwide changes. According to the National Educational Planning, 9th edition (2002-2006), this plan has been designated as the map to identify long term goal in the Nation Educational System in order to develop qualified individual. This must be done to develop individual learning potential as well as encourage self-learning and self-development with creative ideas and analytical skill. This would enable individuals to think creatively, analyze logically, solve problems rationally, and possess virtue and morality at the same time as being able to apply knowledge, good skill and preference with own life style in order to adapt and stay in society happily (Office of Basic Education, 2004: 2).

Educational activities in all levels are important, especially in primary education as there are compulsory subjects for all Thai children stated in the Primary Education Curriculum, B.E. 1978 (Revised Edition 1990). Educational activity at this level is aiming for learners to think, operate, and solve problems as well as develop basic knowledge and skill in making a living. It is hoped for learners to practice

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mainly on learning and thinking process as well as including regular training on ethics and desirable value (Siripat Jetsadaviroj, 2003: 2)

Therefore, basic education B.E. 2001 (A.D. 2001) has become an important mechanism for molding learners into perfect humans with goodness, intelligence, happiness, being Thais and having potential to do further studies and make a good living. Apart from the above-mentioned, learning management through numerous methodologies based on physical and intellectual development, interests and learner's abilities were also directed at learning on actual conditions, self-learning, and participatory learning as well as learning from nature, practical learning and integrated learning (Ministry of Education, 2002: 21).

On the learning process management model in accordance with the National Act of B.E. 1999 (A.D. 1999) Basic Education B.E. 2001 (A.D. 2001) and Standard Education as the Nation Education Law, Article 6 stated that educational management must be done to shape Thais into perfect humans in physical, spiritual, intelligence, virtue, ethics and cultures to fit for living and being able to coexist with others in harmony (Office of National Educational Council, 1999: 5). It required instructors to arrange for diversified learning contents and activities, including problems which related to preparation of learning units. In this case, there were teachers and concerned parties who did not understand clearly on preparation of learning units and integrated learning which could send their effects towards learning activity. This required teacher's capability for joining contents through integrated learning in order to connect between concepts and subjects so that learners could benefit from learning and apply knowledge to daily life (Office of National Educational Council, 2004: 12).

Arranging learning activity in accordance with the integrated curriculum must allow learners to choose what they are interested in. This would permit learners to learn relationship between various things in actual situations. Topics must be set by considering learners' interest and what they would learn most from. Subject instructors must be confident and understand integration, learners' potential, and the nature of activities. It must have contents connection in the same subject together as well as joining relevant materials with learner's real life situation. Further from developing

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learners in physical, emotional, social, spiritual and intellectual, beauty and virtue need to be developed also. These things would influence students' emotional, ideas and beliefs or so called attitude which is a crucial factor for learning. Attitude may be built and modified depending on student's behavior. Teachers should find the way to promote or improve attitude to favor learning so that students would pay more attention to what they are studying. Generally, good attitude towards certain learning should make students succeed in learning (Department of Curriculum and Instruction Development, Ministry of Education, 2001: 27).

Integrated learning management is learning to link within the academic groups, between academic groups and association with real life so that learners can learn with understanding how these things are associated together and related to daily life activities, knowledge, experiences and characteristics from learning. This should help learners to link and join with real life (Teerachai Boranachot, 2001: 6-7).

Integrated learning has not acted as a determinant of learning model because learning model needs to consider which contents and activities are suitable for students. Teachers must choose their own teaching methodology that is able to help most students to achieve set goals and select learning media that are easy to understand as well as activities that enable students to display desirable behavior and that are mostly enjoyable (Bunsiya Sawangjaeng, 2001: 2). Besides, integrated units teaching is the model to respond best with children's leaning method. It is also an infused subject model. This model is the way to include ideas and knowledge in other disciplines or subjects with contents related to the environment. Examples include environmental education concepts in science, social science and life experiences promotional group (Department of Environmental Quality, 2000: 62).

With those characteristics of integrated learning, one could see learning benefits towards learners' development because learners have recognized valuable learning value essential for living. Learners would be able to link between man and nature, environment, society, culture, customs, community, locality and nation as well as understanding reasons for changes, self-effects, and self-improvement so that they could learn and keep up with changes. They would be able to face new situations and solve problems effectively. Furthermore, integrated learning has shaped learners with

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good learning habits who are able to search for knowledge from learning sources and technological media. They would possess skill in analysis, information evaluation, decision making, choosing data appropriate with events and develop working skill, management skill, system working, self-value and coexistence in harmony (Ministry of Education, 2004: 5).

It may be concluded that integrated management for learning is important and has been defined as guidelines for learning management in educational reform in order to effectively develop learners for desirable traits. This needs cooperation from all concerned parties. Staff have been developed for better knowledge and understanding in key contents of integrated learning process. Good attitude would be developed among instructors so that they could recognize value and valuable aspects of learning management, including knowledge and understanding existing limitations and ways to solve them. Instructors must be creative with good management system that opens opportunity for instructors to choose Integrated Model suitable for learners, learning contents, expected learning results to match with own skill. There is follow-up to monitor and provide assistant in information media, materials, and equipment to provide learning as well as searching for support from concerned parties by considering outcomes that may affect learners (Ministry of Education, 2004: 7).

Environmental education is the process to provide knowledge systematically by transmitting environmental knowledge to individuals at every level. This should create knowledge and understanding in environmental issues and solve environmental problems accurately as planned. It is the way to create environmental personnel to guard society so that people could live together without causing any troubles or disturbing environment. This should help develop man with environmental ethics (Kasaem Junkaew, 1993: 71).

This research created 4 research questions. First, what is the guideline in developing teachers' capacity to integrate environmental education with other academic groups? Second, how is the present situation as related to learning management for students in basic education school? Third, how can teachers gain knowledge regarding integration, environmental education and academic groups?

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Fourth, how effective is integrated environmental education when applied with other academic groups.

Therefore, it is extremely important to improve integrated environmental education for teachers in order to teach students more advanced basic education to coincide with National Education Act B.E. 2542 (A.D.1999). When educational reform integrated environmental education contents into all 8 academic groups in 4 class spans of basic education to become a standard, it gained wide acceptance so that future environmental education Curriculum should be a course with contents and other issues including all learning subjects (Office of Basic Education Council, 2004:4-5).

For these reasons, environmental education curriculum has become a significant medium to raise consciousness among school teachers and students. This is done in order to raise their awareness in environmental protection at school, aiming for better and sustainable environment. It is a way to promote integration of environmental education with participation of 8 academic groups by allowing teachers to transmit acquired knowledge, skill and attitude to school students until they are able to practice and receive concrete results. Therefore, it is the pilot study for school in basic education to be good example for integrated environmental education for other schools by linking 8 academic groups together and further developing and adapting integrated environmental education with other courses at school. It is aiming for effectiveness and sustainability in learning quality development at school.

As data shows that environmental education in basic school alone cannot make learners learn well and achieve environmental purposes, it is necessary to make environmental education teaching more concrete by putting the emphasis on integrated environmental education with all 8 academic groups in accordance with the educational reform plan of the ministry of education to help learners develop a conceptual framework in learning and achieving higher environmental education.

Therefore, an integration of environmental education with other academic groups for teachers' basic education is crucial for developing teachers who can integrate effectively. It is also making teachers understand integration of environmental education with academic groups better. There are 4 steps in the operation. The first step is environmental education in the community. The second

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step is to build integrated environmental education with various academic groups in basic education. The third step is involved with arranging environmental education activities. The fourth step is to evaluate effectiveness of integrated environmental education model with other academic groups. These steps are good methods to manage integrated environmental education management and enable teachers to integrate environmental education with all 8 academic groups. It is done by transmitting knowledge in environmental education in all 8 academic groups to students to make students achieve objectives of environmental education and reach learning goals in 8 academic groups so that the environmental development at school and community can be done with sustainability.

1.2. Research Objectives

The research objectives were to design and evaluate effectiveness of integrated environmental education with academic groups for teachers' basic education in schools.

1. 3. Scope of the Research

This research was aimed at the construction and evaluation in the effectiveness of integrated environmental education with academic groups for teachers in basic education, specifically Nakhonpathom educational office district 2. The research consisted of 4 steps. The first step is in students' learning of environmental education, integrated learning management and students learning on environmental education by conducting the analysis and synthesis for constructing integrated environmental education model. Second step is involved with the construction of integrated environmental education with academic group based on conceptual framework of integrated environmental education and academic groups. Third, arranging environmental education activities for teacher basic education in 11 schools at Banglen district, Nakhonpathom province and finally, evaluation of the effectiveness of integrated environmental education with academic groups based on real situations with basic students for a session from May 2007 to October 2007.

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1.4. Operational Definition of Terms

1.4.1 Integrated learning management is defined as learning activities to guide learners to link environmental education with 8 academic groups consisting of Thai language, mathematic, sciences, social studies, religion and culture, health and physical education, art, occupation and technology, and foreign languages.

1.4.2 Integrated environmental education with academic group for teacher basic education is defined as the set of learning plans regarding academic groups and environmental education for teachers to teach students in basic education

1.4.3 Environmental education is defined as a management process on environment for the learner to have knowledge, understanding, attitude, participation and ability to evaluate results and gain an awareness of environmental value.

1.4.4 Environment at school and community is defined as surrounding environment at the school and community related to soils, water, air, energy, plants, animals, cultural concepts, culture related to group gatherings, cultural behavior and cultural objects.

1.4.5 Students' learning on environmental education is defined as learning results of students on environmental education consisting of learning results in 6 areas of awareness, knowledge, attitude, skills, participation and ability to evaluate results.

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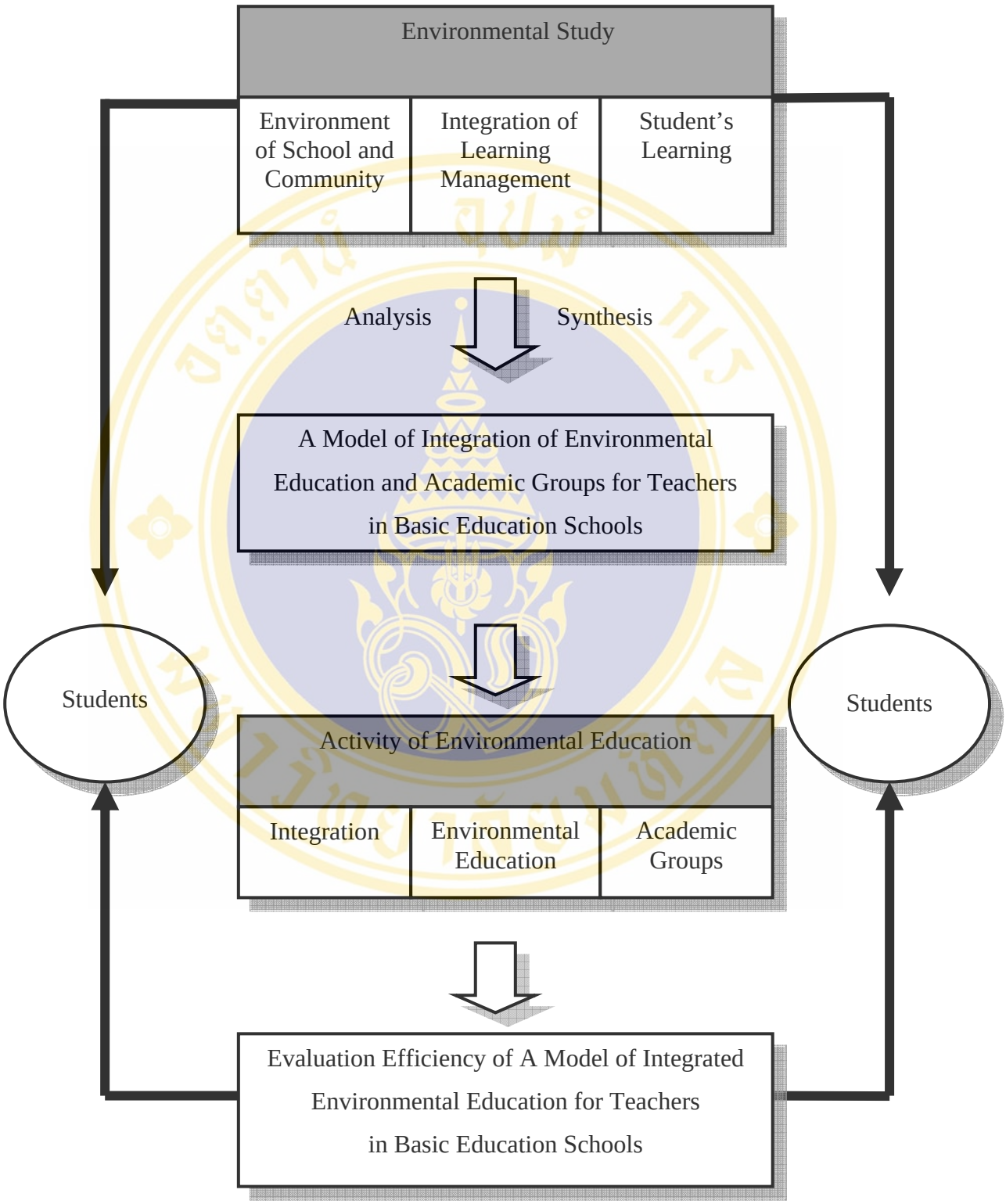

Figure 1 Conceptual Framework Integration of Environmental Education for Teachers in Basic Education Schools

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1.5. Research Conceptual Framework

This research has identified a research conceptual framework in environmental education integration for schools in the basic education level as participatory action research. The research consisted of 4 steps: the first step in students' learning of environmental education, integrated learning management and students learning on environmental education by conducting the analysis and synthesis for constructing integrated environmental education model. Second step is involved with the construction of integrated environmental education with academic group based on conceptual framework of integration of environmental education.

1.6 Research Contributions

1.6.1 Teachers should gain knowledge in environmental education curriculum and be enabled to integrate with their own academic groups.

1.6.2 Deriving a process with participation between teachers in each school should result in brainstorming sessions for integrating environmental education.

1.6.3 Environmental education curriculum should be able to integrate with academic groups in basic education and become widely accepted.

1.6.4 It will shape guidelines for interested persons to study in environmental education integration with academic groups in the schools at basic education level, enabling operations to continue.

1.6.5 Teachers in schools nationwide could utilize integration for direct benefit by using the research guidelines in their own classes.

1.6.6 Students will receive direct benefits from the teachers by their bringing patterns of environmental education integration to improve subject contents for instruction.

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CHAPTER II

LITERATURES REVIEW

The research in the integration of environmental education for teachers in basic education schools. This research has set its objectives to design and evaluate effectiveness of integrated environmental education with academic groups. Therefore, the study of this research in conceptual framework, theories and relevant researches had been divided into the following sections:

2.1 Environmental Education
2.2 Learning Management for Integration
2.3 Curriculum of Education for Basic Education in 2001
2.4 Research Concepts and Theories
2.5 Research Related

2.1 Environmental Education

2.1.1 Principles of Environmental Education

Environmental education is the process to develop intelligent human beings, principles of environmental education involved with building internal knowledge, then display as external knowledge, words from mouth from one person to another and so on to create environmental education. from the meeting at titlist, The Soviet Union in the year 1997 had defined principles of environmental education as guidelines for the practice as follows: (Department of Environmental Quality Promotion, 2001: 6)

1) Environment education should be looked at as holistic environment to consider man-made environment in technique and social in economic, politic, technology, culture, history, ethic and beautiful scenery.

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2) Environment education must be life time learning process by starting from pre-school and continue to all levels formal and informal.

3) Environment education must unite knowledge by combining knowledge together.

4) Environment education must check environmental problems form different regions from local, country and regions to the world levels so that learners can thoroughly understand environment in all issues.

5) Environment education must stress current environmental situation as well as considering the past situation.

6) Environment education must promote value and necessity to cooperate prevention and solve environmental problems in local, country and between countries.

7) Environment education must carefully consider environment for planning development and progress.

8) Environment education must help learners to plan learning experiences and provide opportunities for decisions-making and accept consequences form such decisions.

9) Environment education must link sensitivity, knowledge and skill in solving problems and environmental values with learners in all ages and stress on sensitivity toward environment in own community to child learners.

10) Environment education must help learner searching for nature and true cause for environmental problems.

11) Environment education must stress on the complexity of environmental problems and necessity to develop thinking skill and solve problems.

12) Environment education must use diversified learning surroundings by emphasizing on the practice and direct experience widely open foe environmental learning.

2.1.2 Environmental Education

Environment education is the concept originated from The world conservation union or international union for conservation of nature resources: IUCN which arranged the meeting in environmental education worldwide. As a result,

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Belgrade charter had been invented as the concept and practice in environmental education. in the year 1975 (Office of Environmental Policies and Planning, 2004: 270). the Belgrade Charter mentioned the aim of environmental education and guidelines in the study as the process to create values, awareness and understanding of coexisting of environment in nature, economy, social and political by giving everyone the opportunities to develop knowledge, attitude, skill, knowing how to make decisions for changing in attitude and behavior in order to prevent and improve environment. It is included the construction of model for environmental new life-styles for individual, group and society (Environmental Quality Promotion Department, 2001: 5) because environmental education is to develop human for environmental-friendly. There are more definitions of environmental education as follows:

Environmental promotion (2001:128-129) defined environmental education as the learning process for value appreciation and clear concept to develop skill and attitude for understanding and appreciated relationship between human and natural environment, including proper behavior in environmental quality preservation.

Thai Creativity Association defined environmental education as the process aiming for developing learner to know and understand in environment and association between human and environment and being aware of own duties in coexisting with environment, having attitude and positive action toward environment , including participation in the conservation and development of sustainable environment (Office of Environmental Policies and Planning, 2004, 270).

Kasaem Junkaew (1993: 71) gave the meaning of environmental education as the process to provide knowledge orderly and systematically, especially the application of technological education to transmit environmental knowledge to individual in all levels in order to maintain god quality environment.

Conclusions can be made from the above-mentioned that environmental education is the process which emphasized the relationship between human and environment to make individual or people aware and change behavior by becoming environmental-friendly, aiming to achieve objectives in the following issues as follows (Environmental promotion, 2543: 15, 2545: 129).

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1) Awareness in environmental education makes individual aware of environmental problem, create awareness, being alert and responsive to environment and existing problems.

2) Knowledge in environmental education provides individual worth basic knowledge and understanding in environment, problems and guidelines for solving problems.

3) Attitude in environmental education gives individual value and concern about the surrounding environment as well as being the driven force for practicing and solving environmental problems.

4) Skill in environmental education provided individual with skills and practice necessary for correcting and protecting environment.

5) Participation in environmental education gives individual the chance to participate in changing and protecting environment in all levels.

6) Evaluation ability in environmental education makes individual able to forecast and decide to act properly toward environment.

2.1.3 Significance of Environmental Education

Since the principles and concepts of environmental education confirmed the serious need to include environmental education in the curriculum, UNESCO had arranged the meeting in 1975 at Belgrade to draft environmental education which contained the necessary statement that the learner must perceive environment as holistic, whether being natural or man-made environment which link between ecological system, politic, economic, technology, social, laws, culture and beauty (Earth Foundation, 1994: 77). Therefore, environmental education is the way to build environmental consciousness. Furthermore, strategy for managing natural resource and environment mentioned the importance of environmental education regarding building conscious among Thai people to recognize the necessity of preserving environment for improving life quality. It stated in the building holistic knowledge, understanding environment by including environmental education in the curriculum in all levels and systems to imbed correct attitude and value in the conservation of natural resource,

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environment and culture, including building consumer behavior as environmental-friendly and awareness in the right to participate in environmental management (Thai Environmental Institute, 2001: 21; National Economic and Social Development Office, 2001: 66) However, environmental education is still lifetime learning with the application of knowledge in various disciplines and the study that yield the best result is the participation in preventing and solving problems by studying world environmental problems and differences in local problems, the study of environmental situation both present and future, including the study of relationship between progress and development with environment by putting the emphasis on the environment as well as including contents that promote value and point to the need for cooperation in all levels from the local to the world for solving environmental problems (Green Earth Foundation, 1994: 77)

2.1.4 Practical Guidelines on Environmental Education

From concepts and value of environmental education, the guidelines of learning in environmental education had been setting up by international students consisted of 3 guidelines as follows: first learning about environment, second learning in environment and third learning for environment. Thus, environmental education is to integrate all three guidelines together to create holistic Learning as follows (Environmental promotion department, 2001: 6; Office of environmental planning and policies, 2004: 271):

1) Learning about the environment is making learners know and understand the work of natural and environmental system, including the effect from human activities in local, country and world levels.

2) Learning in the environment is giving learners experiences from self-practice in the natural or direct surrounding which is crucial for development for training in decision-making and problems-solving.

3) Learning for the environment is the implementation of knowledge from learning in the practice valuable to environment and nature in real lifestyle.

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2.1.5 Environmental Education in Thailand

Thailand has applied environmental education as the strategy leading to sustainable development and conservation by having environmental activities such as field trip, group process implementation, case study and field study. environmental education in Thailand started from School to Higher Learning to Community. environmental education is consisted of 3 types as follows: first environmental Education in School, environmental education in Higher learning and informal environmental education (Office of Environmental Planning and Policies, 2004: 271-273).

1) Environmental education in school is curriculum reform which emphasized on contents of learning in environment as the process in Sustainable Environmental Education in and practice as well as reforming school management practice as defined, reforming teacher and provide teaching approach in environmental education to teachers. curriculum development involved teaching in Environmental education in 2 ways as including environmental education in all subjects and levels and integrated process as follows:

1.1) Environmental education is being included in the curriculum in all subjects and levels by integrating Environmental Education with teaching contents so that learning can have different perception.

1.2) Integrated process by emphasizing on thinking concepts, analysis, problems solving, decisions-making and communication to create understanding with environmental education activities, leading to learning from direct experience on natural resources and environment as well as linking acquired knowledge with daily practice.

2) Environmental education in higher learning higher learning emphasized on giving knowledge, staff development and preparing curriculum with environmental education activities such as training staff, publicize on concepts and process of environmental education to outside divisions, developing media, arranging the practical meeting for teachers in primary and secondary schools, providing services in

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environmental education in the community, schools, public and private sectors and being the source for knowledge and training youth.

3) Informal environmental education or community is managing sustainable environment by starting to learn about compatible and sustainable living with environment which can be learned from the surrounding. Therefore, Informal environmental education is making learners part of solving environmental problems facing the community and emphasized learning from nature by giving advice and sharing knowledge, leading to awareness and suitable and proper practice. Factor effecting successful informal environmental education is making community to favor learning with local experts in caring for resource, including the support from executive as well as providing activities to create learning such as camping, nature classroom, and community learning center by having division such as department of informal learning education to arrange environmental education in the community.

From previously-mentioned guidelines of environmental education to apply as environmental education for teachers in basic education schools, environmental education for communities can be stated as informal environmental education by being learner center with contents in local curriculum with integrated of knowledge in learning as outdoor Learning.

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2.2. Integrated Learning

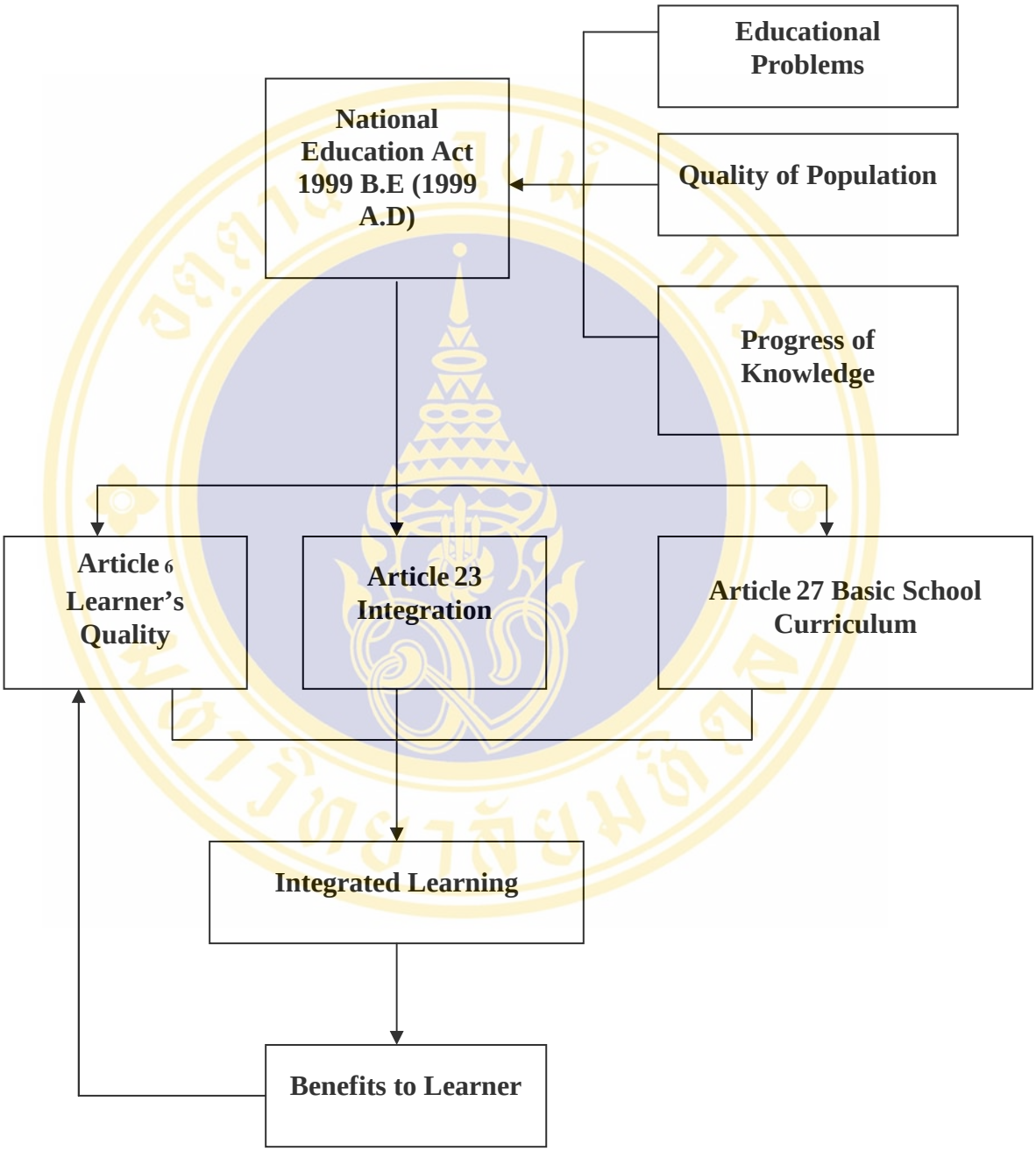

Figure 2 Significance of Integrated Learning Management

Source: Office of Basic Education Committee 2004: 1

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2.2.1 Meaning of learning integration management various definitions were given to Learn Integration as follows: Integration is defined as making subunits into closely related to each other working as one with its own self-completion (Phrathep Vethee: 1899: 24).

Integration is taking different related sciences mixed together to arrange various curriculum together and combine unique old identity to create new identity of curriculum (Suvit Moolkum and Orathai Moolkum,2002: 182).

Sumitr Kumakorn (1985: 42) gave the meaning of integration of complete unit integration meaning as " fully completed " which had been referred to collection or gathering within the same unit. This knowledge can help learners to achieve unit goals. If the unit bases its core on activity, integrated unit can reflect the actual condition of knowledge application in real life.

Saroj Buasri (1978: 3-12) had defined integration as perfection in the situation without worried or mind and spirit torture or serious problems. Human most desirable thing in life is for to teach another human to think so that their offspring can solve problems later in life.

Conclusions on integration are made from the above definitions that it represented the connection and mixing all related academic contents, adding core subject for in-depth knowledge for proper application and practice.

2.2.2 Type of integrated learning is first the integration within when content of 1 core subject can be integrated in to similar subject. Next integration between subject is to separate between each subject by determining topics, conceptual framework and similar problem (Udom Cheykeevong, 2002: 28) as being explained in the following details:

2.2.3 A model of integration learning. there is many the format depend on objective and suitable of learner and academic groups (Udom Cheykeevong, 2002: 48) as being explained in the following details:

1) Infusion is inserting more contents by instructor only. In another words instructor would teach only the subject under his responsibility and insert contents of other subjects in his own teaching.

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2) Parallel is parallel teaching that require teachers from 2 persons up to teach different subjects but both teachers need to plan together by designing same topic, concept and problem

3) Multi disciplinary is similar to parallel teaching but being assigned the tasks or Project by giving joint responsibility to link various subjects together as small projects for students in each subject.

4) Trans disciplinary is when teachers of different subject joined together and taught as a team, planning and consulting together as well as determining topics, conceptual framework and problems before teaching together.

2.2.4 Regarding components effecting integrated learning management (Udom Cheykeevong, 2002: 49), there are many definitions as follows:

1) Integration must start from curriculum integration, analysis problems, nature and demand of learners. It is the integrated curriculum needed to gather idea and more complex than curriculum content with analysis in problem, nature of learners. It is also the valuation of results to coincide with curriculum.

2) Integration of contents must be planned by the school to analyze, plan teaching, working together form all sides, learners and teachers and executives of school to make it successful.

3) The evaluation of results must be compatible with integration by considering from cooperation in teaching which has different criteria from regular evaluation.

2.2.5 Integrated curriculum has many features as defined by UNESCO (1981: 7-10) as follows:

1) Integration of knowledge and learning process is important component of curriculum for new and complex society with in-depth knowledge that putting the emphasis on the process for learner to acquire desired knowledge.

2) Integration of cognation and affect: There is the criticism about the true nature of learning process in the objectives of Affective Domain which received less attention than Cognitive Domain. In principles, it should be equally important.

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Therefore, curriculum integration must combine knowledge, concept and affect together.

3) Integration of knowledge and conduct should receive the same attention as the association between knowledge and affect. Separation of knowledge from Conduct is to divide curriculum into 2 parts but still related to the dame content. Therefore, integration of knowledge and Conduct must be done together.

4) Integration of school learning with the actual Life of the learners is to integrated subject contents to achieve true goals of such curriculum that should be meaningful and helping learners to improve life quality outside school. Some model of integrated curriculum must put the emphasis on teaching process based on learner's interest and demand of learners, including teaching real life situation.

5) Integration of subject areas is to integrate various subject contents together as being the new subject with similar contents and integrated curriculum in the same features. It has been important model widely used. In teaching subject contents, instructor should not include only single concept but rather paying attention to the investigation process and still maintain truth and principles together by giving attention to the education management, affect process and action as well.

2.2.6 The Advantage that Receive of Learning Integration Management of UNESO (1981: 7-10) as follows:

1) Transfer of Learning: Acquired knowledge is connected to new knowledge so that learning can be done faster and easy to remember.

2) Arrange subject or knowledge to match real life or mix and match features of model favorable to real life situation.

3) Help learner to understand social problems better. Action or any social phenomena resulted form many problems and difficult to correct and understand such problems. Then problems and sources of problems should be gathered form various sources to create new understanding.

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4) Make learning and education more values instead of being the process to transmit only knowledge which should help developing necessary skill for accurate concept, leading to desired value.

5) Integration of knowledge changed objectives of teaching by making learner to understand the value and being able to apply knowledge.

2.2.7 Teaching integration is defined as completion in all areas such as strong physical, good emotion and able to solve problems. Simply saying, the development is happening in all 4 areas of physical, emotion, social and intellectual (Banlae Plucksawan, 1988: 107-109).

1) General principles in the development of content are based on the primary principles of John Dewey consisted of the following areas:

1.1) Subject contents should be related stories and experiences related to daily life of students to create desired learning behavior. Therefore, teacher must adapt the content to match students 'daily activities.

1.2) In order to make teaching worthwhile, children must be taught to do some work to understand the nature of work by determining association or related subject. Students can learn from action to make learning better

1.3) Learning and teaching should be fun sometimes and tired in some other times to be unforgettable moment. In other words, it created experiences and respond to the demand of learners 'emotion. Therefore, in the development of the content into the lesson, one must include fun subject to entertain the learners as well

2) Guidelines for constructing lesson are to build it in one group as integrated teaching unit (Banlae Puksawasn, 1988:110).

2.1) To study contents to check details for making it suitable for learners' age and agree with children daily activity and coincided with the surrounding environment in that area.

2.2) To develop content for children to familiar with or being part of their lives

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2.3) To determine objectives in teaching through behavioral objectives. Teachers must ask himself why teaching and what to gain from teaching as well as giving direction and guidelines for practicing

2.4) Students ‘activity is the heart of teaching. Teachers must realize children display from that lesson.

2.5) According to Bruner, contents must be related and better if they can be continuously teaching. In this case, teachers must be the one who defined subject association, not only one particular subject but extend to other subjects as well.

2.6) Evaluation must consider teaching method, point of observation, work and testing whether they understand or not.

3) Integrated Units Teaching is difficult to do because of centralize system (Department of Curriculum and Instruction Development, 1966:31). Curriculum development is also difficult to make it concise which involved unit integration based on contents and experiences of all groups. Separation of subject content is not useful for daily activities because it created unfavorable situation. Therefore, curriculum in this day and age is done as integration unit to achieve learning, leading to the application in real life (Bunlae Pluksawa, 1988: 112).

4) Integrated Units Teaching based on human preference by arranging contents to mix and match with activities to link subjects without paying attention to specific subject. Integration unit must be consisted of the following features (Bunlae Pluksawa, 1988: 113)

4.1) Core or Subject Mastery is the core of the subject with wide contents and Inter-related Program

4.2) Ingredients is experiences or other subjects determined in the curriculum to combine in one lump so called Integration.

Ingredients before can be combined together must be atomized to mix or bond better

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5) Characteristic of core integration unit since the development of integrated unit aimed for teaching to help solving problems facing the student at the moment by putting the emphasis on 2 main points.

5.1 Integrated teaching must consist of core subject as the lead or center of each learning unit.

5.1.1 Core subject or lead subject must have good association within. In another words, contents of the core subject should match together without being detached from teaching.

5.1.2 Core subject must have contents huge enough to arrange contents of other subjects to mix well.

5.2 Mixing content curriculum suitable for nature of core subject to make into teaching unit may not be done too well. Therefore, teachers' manual for each group must be arranged provided that relationship, news or important event, including teaching duration positively associated with each other. Integrated chart should be done to show the core subjects in each group for the whole year.

5.3 Subject that has been selected for core subject must be key foundation subject for the study or the effort to solve problems in teaching at that level.

6) Students integration emphasized on learner's or results of learning to build integration within learners complexly developed in physical, emotional and social or so called developed in 4 sides, not particularly on either side. These features must be given many considerations so that integration can happen. Integration among learners is the mixture of learning to response to learner's needs completely in eyes, ears and brain as well as good emotion and benefits from learning. Unit integration is being on specific curriculum in 2 ways as follows:

6.1 Integrated activities for unit integration teaching

6.2 Consider each segment to link core subject with other activities such as leading lesson to develop into integrated unit.

7) Inserting knowledge in integrated learning (Yupin Pipitkul, 1993: 238-240) is being referred to inserting knowledge in mathematics consisted of the following steps.

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7.1 Select mathematic content with environmental knowledge related to problems questions

7.2 Select environmental knowledge related to forest, energy, mineral and soil and others.

7.2.1 To make students recognize value of environment as reason for living

7.2.2 To make students realize association between human and environment

7.2.3 To make students realize the surrounding problems from pollution such as pollution in foods

7.2.4 To make student realize the destruction and art objects natural environment so that students can be aware of the responsibility.

7.2.5 To make students know how to solve problems to avoid problems and correct existing problems.

7.3 To recognize purposes of environmental learning and knowledge insertion. Teachers must study the following method.

7.3.1 Consider inserting knowledge in introduction, teaching or conclusion

7.3.2 Construct problems with direct content in environment or environmental-related

7.3.3 Select teaching media suitable for content and time

7.3.4 Select method to coincide with subject contents and environment

7.3.5 Consider whether teacher should be the one doing the teaching or students should be allow to participate in the activity.

7.4 Teacher must set up learning objectives in selecting proper content for further operation. In this case, teachers may use direct environmental questions or indirect environmental conditions.

2.2.8 Integrated Webbed Model is teaching together in different subjects by planning and selecting problems topics or desired issues so that learner's can be

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of significance of topic as related to real life situation to share knowledge and make integrated Webbed Model more effective. Integrated Webbed Model steps are as follows:

1) Determine Theme as being Topic for teaching by considering from curriculum and social roles and explanation in each subject for integration or determining by school. If the teacher cannot conclude, teacher must compromise and brainstorm to consider experience from learning and apply the most in real life.

2) Planning teaching was done in 3 types as follows:

2.1 Each subject teacher integrated own subject to coincide with the topic and timeframe such as 2 weeks or 1 month.

2.2 Teachers planned teaching together based on topic and hours.

2.3 Each subject teacher teaches based on objectives and own topic before planning project.

2.3. Basic Education Curriculum 2001

2.3.1 Principle: To arrange basic education management in accordance to the principle of Basic Education Curriculum as follows:

1) It is the education for the nation unity to direct at being Thai with International.

2) It is the study for people so that all people can receive education equally with social participation in the education.

3) Promoting learner's to develop self-learning continuously by giving most attention to learners to develop naturally and up to their full potential

4) It is the curriculum with flexible structure in contents, time and learning management

5) It is curriculum to manage education in all forms that can cover all target and being able transfer learning results and experiences.

2.3.2 Objectives of Basic Education Curriculum is directed at the development of Thais to be perfect human by being intelligent, happy and Thai with

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potential to further study and capable of making decent living for learners to derive at desired objectives as follows:

1) Recognizing own value based on Buddhist's principles or own religion with morals, principle and desired values.

2) Having creativity, eager to learn, love reading and writing and searching for knowledge.

3) Having worldwide knowledge adapted to changes and academic progress with skill and potential in management, communication and technology, adapted to knowledge and proper method to all situation.

4) Having skill and process in mathematics, sciences, thinking skill, building intelligence and skill in making lifestyle.

5) Loving activities and look after health and personality.

6) Having effectiveness in production and consumption with value for rather being producer than consumer.

7) Having understanding Thai history and proud to be Thai by being firm in lifestyle and democracy, having the King as the country's ruler.

8) Having self-conscious in the conservation of Thai, Art, culture, tradition, Thai wisdom, natural environmental resources development

9) Loving the nation and country directed at benefit and goodness of society.

2.3.3 All academic structures are arranged in accordance to principles and learning standard set up for schools and concerned parties. Therefore, structure of Basic education is being defined into 4 class periods as: class level 1 (Pratthom Suksa 1-3), class level 2 (Pratthom Suksa 4-6), class level 3 (Mattayom Suksa 1-3), class level 4 (Mattayom Suksa 4-6).

2.3.4 Academic groups are determined based on holistic knowledge. Skill or learning process, characteristics or values, morals or ethics of learners in 8 academic groups as follows:

1) Thai language has the vision to create students 'skill in listening, speaking, reading, writing and analyzing systematically with love in language art and

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being able to transmit local wisdom to raise Thai language level in World Class. It is consisted of reading, writing, speaking and the use of language.

2) Mathematics has Thai language has the vision for students to learn, increase knowledge, and understanding in mathematic contents and being able to apply skill systematically with logic and creativity and responsibility. Students can apply knowledge in daily activities happily and realize that mathematics is not that difficult. There are 6 academic groups consisted of numbers and operation, measurement, geometry, trigonometry, data analysis and feasibility and skill/ science process.

3) Sciences contain vision for Thai children to learn with science process and actual practice and being able to apply with Thai lifestyle and develop into sustainable teaching in science for daily life and application with various learning sources. Learning development of Thai children with real practice in Science can be apply in Thai lifestyles related to living creatures and lifestyles and environment, element and properties of elements, movements and energy.

4) Social studies, religion and culture for students to good adult with morals and maintain Thai virtue, keep up with current events and live happily in society. They contain 5 elements in religion, morals, ethics, civic duties, culture and social lifestyles, economic, history and geometry.

5) Art is consisted of art vision, music and classical folkdance.

6) Health and physical education has the vision for students to be healthy with lively spirit and being good sports and good attitude. There are 6 areas consisted of human growth and development, life and family, movement, exercise, playing games, Thai sport an all sports, building health and capacity and diseases prevention, life safety and art.

7) Vocational and technology has the vision for students to develop works and ideas with technology. There are 5 areas in daily activities and families, works and designing, technology and Information technology and technology for works and occupations.

8) Foreign language has the vision for students to learn for communication ability to search for information as being required in modern living.

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There are 5 areas in language for communication, language and culture and language with association with other academic groups.

All 8 academic groups which are basic foundation for learners to learn can be divided into 2 groups: first, Thai language, mathematics, sciences, social studies, religion and culture. They are academic groups based on learning to be basis for building foundation and being strategy for solving problems and national crisis. Second group is consisted of health and physical education, art, vocational and technology and foreign language. It is the way to build human foundation and capability for thinking and working creatively in Environmental Education. Basic Educational Curriculum has determined groups and learning standard especially in sciences, social studies and religion and culture, health and physical education and foreign languages in English for all classes. For other foreign languages, selections are based on appropriate basic educational system and determine necessary learning contents for the development of all learners. For other learners' skill parts and interests, it depended on institute to set up areas to match with learners' capabilities.

2.3.5 Learning Standard for basic curriculum determine standard learning based on 8 academic groups as to determine quality of learner's in knowledge, skill, morals process, ethics and value of each group as to develop learners for desired features comprised of

1) Standard Basic Education is for learning in each academic group when learners complete basic education.

2) Standard for learning Period is the standard learning in Prathom Suksa 1-6 and Mattayom Suksa 1-6.

Standard learning in basic education defined as necessary standard learning for develop learner's quality to coincide with community and social problems, local wisdom and desired trait for good family, community, social and nation, including standard learning based on ability, skill and interest of learner so that school can be develop further.

2.3.6 Standard Learning for academic group in Basic Education as follows:

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1) Thai language as compulsory subject to complete in various groups as follows:

Academic1: Number and operation consisted of 1 standard in understanding the diversity of number and the use number in real like and understand relationship for solving problems through estimation in calculation and problem-solving .

Academic2: Measurement is consisted of 1 standard in understanding background of measurement and estimated size of measurable objects, including making miserable problems.

Academic3: Geometry is consisted of 1 standard in explanation and analysis 2 dimensions and 3 dimensions, using visualization, spatial; reasoning and geometric model for solving problems.

Academic 4: Trigonometry is consisted of 1 standard in explanation and analysis as pattern and association and different functions.

Academic 5: Data analysis and Feasibility is consisted of 1 standard in understanding and statistical analysis.

2) Mathematics is consisted of different group of learning as follows:

Group 1: Numbers and operation are consisted of 1 standard such as understanding in the diversified numbers and the application of numbers in real life situation as well as understanding results from association and problems-solving with forecast.

Group 2: Measurement is consisted of 1 standard in the basic understanding and estimation of measured objects, including problems-solving in measurement.

Group 3: It is consisted of 1 standard such as explanation and analysis of 2 and 3 dimensional geometric models, visualization, spatial; reasoning) and geometric model to solve problems.

Group 4: Geometry is consisted of 1 standard in the explanation and analysis of pattern, association and other functions, using equation and graphs and other mathematic models to substitute for other situation including interpretation and problems-solving.

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Group5: Analysis of data and feasibility are consisted of 1 standard in understanding statistical analysis and the application of statistic and knowledge in reasonably forecast.

3) Sciences are consisted of different group of learning as follows:

Group 1: Living creatures with life activities is consisted of 1 standard in the basic understanding of life, association of structure and duties of various natures with association and process to search for knowledge, ability to apply knowledge from learning with daily activities. It is also involved with the understanding of process and significance of transferring heredity, Biodiversity, the application of Biotechnology which impact human and environment, process to search for knowledge, science mind, and communication on knowledge and the application of knowledge.

Group 2: Life and environment is consisted of understanding local environment, association between environment and living creatures and other living organisms in ecosystem. It has contained the process to search for knowledge and science mind and communicate knowledge, and application of knowledge and environment and the use of local natural resources, nation and world for sustainable local resources and environmental management.

Group 3: elements and properties of elements are consisted of 1 standard in association between properties of elements with structure and pulling force.

4) Social studies, religion and culture is consisted of different group of learning as follows:

Group1: religion, morals, ethics is consisted of 1 standard in understanding the history, Buddhism moral principles or own religious principles and being able to apply religious teachings in daily activities. Moreover, it had taught us to committed to moral and good merit with good value and faith in Buddhism or own religion, behavior and act according to teaching in Buddhism or own religion to benefit society and environment for peaceful coexistence.

Group 2: civic duties, culture and social lifestyles is consisted of 1 standard in acting as being good citizen to comply with the laws, tradition and Thai

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culture, coexist in Thai and world society happily with understanding in current politic, having faith, worship and maintain system for having the King as the country's ruler.

Group 3: economic is consisted of understanding and being able to manage production resources and limited resources consumption effectively and worthy, including understanding principle of self-sufficient economy for maintaining equilibrium in accordance with standard S 3.2. It is required understanding in system and economic institute associated with economic system and the necessity for world economic cooperation.

Group 4: History is consisted of 1 standard for understanding the meaning and significance of time and history era and able to apply historical method based on cause and effect to analyze all events systematically. It is done for understanding human development from the past to present in association and continuous change in the situation as well as being aware of the importance and being able to analyze impacts, understanding being Thai, culture and Thai Wisdom with pride and maintain being Thai.

Group 5: Geometry is consisted of 1 standard for understanding earth physical and awareness of substance effects in natural system, using map and geographical instruments to search for data and GI, leading to effective use and management while understanding the association between human and physical surrounding to create culture and awareness to conserve resources and environment for sustainable development.

5) Health and Physical Education is consisted with the following areas:

Group 1: Human growth and development are consisted of 1 standard in understanding nature and growth and development of human

Group 2: Life and family are consisted of 1 standard in understanding and value life, family, sex education and having skill in life activities.

Group 3: Movement is consisted of 1 standard in understanding, having skill in movement, physical activities, playing games and sport, loving exercises, games and sports and love doing it regularly with disciplines, respect rights,

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rules and being good sports with spirit in competition and admiration in building healthy body.

Group 4: Building healthy body to prevent diseases is consisted of 1 standard in seeing values and skills to create and maintain good health, sickness prevention and building health capacity.

Group 5: Safety in life is consisted of 1 standard in prevention and avoiding risk factors, risky behavior towards health, accidents, using narcotic and violence.

6) Art is consisted of the following areas:

Group 1: Visual art is consisted of 1 standard in creating visual art cased on imagination and creativity, analysis, criticism on art work, transferring feelings and ideas towards arts freely, admiring and adapting with daily activities as well as having understanding and association between visual art, history and culture, seeing values of visual art as being cultural heritage, local wisdom, Thai and International wisdom.

Group 2: Music is consisted of 1 standard in understanding and expressing creative music, analysis, making criticism and value music. It is included the appreciation of music freely and adapted with daily activities, understanding between music, history and culture as well as value music as culture heritage, local wisdom, Thai and International wisdom.

Group 3: Classical Folkdance is consisted of understanding and expressing creative Classical Folkdance, analysis, criticize the value. It is included the appreciation transmitting of ideas freely and adapted with daily activities, understanding between music, history and culture as well as value music as culture heritage, local wisdom, Thai and International wisdom.

7) Vocational and Technology is consisted of the following areas:

Group 1: Lifestyles and family is consisted of 1 standard in understanding, having creativity and skill, morals and awareness in the use of energy resources and environment at work, in daily activities related to housework, agriculture, handicrafts and businesses. It is included having skill, working process

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and management, working as a group, searching for knowledge and able to solve problems at work, love working and having good attitude towards working.

Group 2: Occupation is consisted of 1 standard in understanding, having skill in honest works, morals and good attitude towards occupation and recognizing guidelines for working honestly.

Group 3: Designing and Technology is consisted of 1 standard in understanding nature and technological process with knowledge, wisdom, imagination and system thinking in the design of objects, utensils, methods, strategies based on technology and ability to make decisions. It is included the selection of technology for life, social, environment, work and occupation creativity.

Group 4: Information technology is consisted of 1 standard in understanding and seeing the value of Information technology to search for information, learn, communicate, solve problems and work effectively and efficiently with good morals.

Group 5: Technology for work and occupation is consisted of 1 standard in the application of technology, production, designing, problems-solving, building work and honest occupation with strategic planning and creativity.

8) Foreign language is consisted of the following learning contents:

Academic1: language for communication is consisted of 1 standard in understanding, listening process and reading with the ability to interpret listening and learning subjects from various media reasonably with skills in language communication, exchange data, news , express feeling and opinion with technology and proper management for lifetime learning, understanding the process, writing and communicating data, conceptual framework and opinion in other subjects effectively with beautiful scenery.

Academic 2: language and culture is consisted of 1 standard in understanding relationship between language and culture of language owner and being able to apply language in proper occasion, understand the similarity and differences between languages and culture and use it intelligently.

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Academic 3: language and relationship is consisted of 1 standard in the use of foreign language to connect knowledge with other academic groups and being the basis for expanding own horizon.

Academic 4: language with community relation consisted of 1 standard in the ability to apply foreign language as learning instrument to extend education, occupation, participation and coexistence.

Academic Group1: Visual art for 1 standard as creativity based on imagination as well as analysis, criticism of artwork and transmitting feeling and ideas towards art freely

Academic Group2: Music for 1 standard based on understanding and display music

Academic Group 3: Classification Folk with creativity, analysis and criticism in art.

2.4 Theories Related to Research

2.4.1 Learning Theory

Findings from the study indicated that many psychologists and scholars had given various meaning of learning as follows:

Psychologists (Sucha Junaiem, 1976: 144) defined learning as the ability of organic matter to adapt with environment in order to survive. Learning rules is the basic psychology related to learning as related to successful training. These rules must be studied for understanding and adapting for use. Rules of learning are divided into 9 sections (Vijit Arvakul, 1997: 174-177), in this case only 4 sections directly related to training would be mentioned. These are being explained as follows:

1) The Law of Effect: It is involved in the concepts that human always responded to the effects that benefit themselves. In the same time they would avoid opposite or dissatisfaction. If the participants hope and received new knowledge as desired, they would want to extend their training in other curriculum.

2) The Law of Primacy: It is believed that the first impression in training is very important. If the participants received excellent motivation from training

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subjects and other components such as getting knowledge from training as desired, they would be impressed in the first training.

3) The Law of Exercise: It is the practice with visual aid. Concepts guarantee the practice and should lead to important concept so that human can develop knowledge with more important method that involved 5 visual aids and wider skill so that things can be done faster and quicker and more complete. This is resulting from each practice when certain area has been improved gradually until becoming skillful habit.

4) The Law of Intensity**:** It is based on the practice that a person can remember things well if learning has been reinforced to make it more concentrated and stronger than regular practice, but it can create monotony. Therefore, training must be excited and impressive such as giving more concrete example in teaching with roles playing or case studies.

Besides, Learning theory is consisted of more laws in The Law of Thinking, The Law of Duration, The Law of Disuse, The Law of Association, The Law of Frequency.

Factors promoting learning from changing human behavior from not knowing to knowing (Vijitr Arvakul 177-181) are as follows:

1) Interest is the condition when a person wants to know something

2) Needs is referred to human needs to obtain something of his desire. Needs can be divided into 2 parts as follows:

2.1 Biological Needs or body need such as air or necessities

2.2 Social Psychological Needs is emotional needs such as being accepted or loved , social position and further to Self-Actualization such as helping society , building monument. Human must constantly changed own behavior for new technique such as training or seminar

2.3. Ready to learn in either one situation depended on age, experiences, intelligence and subject contents.

2.4 Remembering the learning subject is the brain ability to memorize what had been learned.

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2.5. Stimulation is learning for Motivation to fulfill Deficiency Motivation.

In conclusion, learning is the process to change behavior from training or experiences (Somboon Salaciwan, 1925: 123).

2.4.2 System Theory

System Theory is the guideline for management which looks at relationship of organization with environment (Siriwan Sareerat and Associates). System is the sub component with interconnection and work to achieve the same objective (Sin Panpinit: 2001: 41). System is consisted of 4 components as follows: first in input, second in process, third in production and fourth reversal (Siriwan Sareerat and Associates: 2001: 55-56).

1) Input of important administration is consisted of physical resource, human resources, data, money and technology

2) Process or Transformation Processor through Put which is the steps of processing input for synthesis, mixing or integrating together properly to create desire results. Resources would be brought into the process and transformed by technology, employers, practice methods and production process.

3) It is the out put or final outcomes from the process such as products or services and operational outcomes and satisfaction of clients.

4) Feedback or reversal data is the data related to condition and outcomes of the organization. These data were used for improving input and transforming administration for more satisfied results.

Furthermore system theory can help executive to define organization scope and use the subsystem with internal system interact with each other. Executive who has systemic thinking would see the organization as Closed system without reaction to environment with self-completion. For Open System, it would be reacted with the surrounding and reverse back. Therefore, all organization are being designed as open System (Sirivan Sareerat and Associates, 2003: 57)

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2.4.3 Participatory learning theory

Participatory learning theory is the learning principle based on learners by asking them to build from previous experiences. Participatory learning is consisted of 5 principles(Udom Cheykoivong, 2003: 87-89) as follows:

1) Being learning based on previous learner's experiences.

2) Creating new knowledge, more challenges or so called Active Learning.

3) Having association with other network to expand knowledge further.

4) Having Communication through speaking or writing as instrument for sharing knowledge and synthesis analysis.

To summarized, participatory learning is learning process to emphasize on building former attitude and skill to share feeling and opinion on such issue as well as discuss idea of learners in small groups which can be applied in real situation.

Participatory learning is involved in 3 processes as follows:

Group Process is done with more than 2 learners.

1) Cooperative Learning is learning through arranging surrounding conditions for learning to be done in small group. Each member must participate in learning for small group as well as giving each other support, aiming for group success which can be contributed to everyone success also.

2) Learning as Constructivism is for learner to search for knowledge and understanding by himself so that knowledge can be extended. Learners can share experiences with others or find new things.

In conclusion, learning process is being concluded as follows: first, relationship between learners with speech and writing. Second, with learning as group to share idea and learning resources and support each other, third, participatory learning so that network can be extend and link to new knowledge.

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2.5 Relevant Researches

Pinda Varasunan (2004:125-138) studied the caused-based model development for integration environmental teaching of Primary School Teachers with 3 objectives with 3 objectives consisted of the following: first to study and compare the opinion level of teachers related to the study of learning management and teacher's ability in teaching's management. Second is to develop cause-based model in the ability to manage integration Environment Education and finally to verify the compatibility of model and evidence-based data. Participants were 299 teachers in Primary School. Research findings indicated that Mean factor in curriculum, organization, organization and no differences in teaching factor. Mean factor in group practice showed statistical significant differences at 0.05. For cause-based model in teachers' learning environment must be coincided with evidence-based data, having the ability to explain the instability of environmental education among Primary school teachers.

Pailin Kanjanapanupun (2006:113-167) had studied teaching management by integrated contents: Development of Teaching English by integrating contents from different subject to learning, leading to learning English in Secondary School. Samples were 43 students of Secondary School who had studied Sciences and Mathematics at Jukkumkanathorn, Lumpoom, session 1, of 2000 through the main English language 11 (017), a questionnaire and recording data of school and teachers. Research findings showed that integrated teaching to learning English (CBI). Many students were satisfied with teaching methods through CBI from being able to integrated English knowledge and ability with various subjects for daily activities, including participation with various activities. It is included developing English Skill in listening, speaking, reading and writing. All students had passed the measured standard and evaluated results of Department of Curriculum and Instruction Department with good average score.

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Siripat Jesadaviroj (2002: 84-179) studied the development of integrated curriculum in 1st grade students at Wat Samiennaree, Bangkok Metropolis to find learning achievement and study the integrated curriculums and studying attitude of students towards arranging learning activities based on integrated curriculum. Samples were 45 Primary School Students 1/3 Grade, selected by purposive sampling. Designed Webbed Model was used in the curriculum with the help from 1st grade teacher for 17 weeks, 5 days a week and 5 hours per day. Data were collected and analyze with percent, Mean and Standard Deviation. Research results showed good student leaning achievement 28.89 and very god at 48.89. Both students and teacher had good opinion about learning activities, and documents most and they wanted to develop and parents wanted to used this curriculum.

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CHAPTER III
METHODOLOGY

The research objectives on integration of environmental education for teachers in basic education schools are to design and evaluate effectiveness integrated Environmental Education model with academic groups for teachers of basic education consisted of 4 operational steps: first environmental education in community and school, learning integration management and student's learning. Second: constructing integrated environmental education model with academic groups. Third, environmental education is arranged for Teachers Basic Education and final step is to evaluate effectiveness of integrated environmental education with academic groups. Research methodology was stated as follows:

3.1 Population and Sample
3.2 Research Instruments
3.3 Step and Environmental Education Process
3.4 Data Collection
3.5 Data Analysis
3.6 Research Statistics

3.1 Population and Samples

3.1.1 Population

Populations for the research were teachers and students from Nakhon pathom educational office, district 2. total 3,760 teachers and 66,598 students were selected from 171 basic education schools classified into primary level or class level 1-2 for 42,355 persons and secondary level or class level 3-4 for 24,243 persons (Nakhonpathom Educational Office, District 2, 2005:3), including population living in such area for 373,844 persons (Nakhonpathom Administration, 2004).

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3.1.2 Samples

Samples in the research were teacher and students teaching and studying in Nakhon Pathom Educational Office District2. They were divided into 3 groups as follows:

1) Out of total samples 70,358 persons consisted of teachers and students, 398 persons provided environmental data in school and community. Teachers and students came from 8 schools in Nakhonpathom Educational Office District2 as follows: Rai King Vittaya School, Rattanakosin Sompod Salaya School, Ngew Rai Boon Mee Rungson School, Bang Luang Vittaya School , Wat Rai King School, Ban Klong Yong School, Wat Ngew Rai School and Wat Bang Ruang School. Samples' sizes were calculated with the formula of Taro Yamane (1973:725) as follows:

$$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{70,358}{1 + 70,358\ (0.05)^2}$$

$$n = 398$$

2) Samples in environmental education activities consisted of 32 teachers from 11 schools as follows: Banglenvittaya School, Bang Luang Vittaya School, Bua Pak Tha Vittaya School, Wat Bua Wan School, Wat Bang Luang School, Ban Klong Phra Mor Pisai, Watwairuvanaram School, That Rut Vittaya 4 School,Wat Sila Mool school and Wat Sool Wattanaram School. All schools had divided education into 4 short class levels of 8 academic groups. The researcher selected 1 teacher from each group with the purposive sampling consisted of class level1 (Prathom Suksa 1-3) for 8 persons, class level 2 (Prathom Suksa 4-6) for 8 persons, class level 3 (Mattayom Suksa 1-3) for 8 persons and class level 4 (Mattayom Suksa 4-6) for 8 persons.

3) Samples for evaluation effectiveness of integrated environmental education with academic groups for teachers basic education in the real situation were teachers selected from 11 schools that had attended environmental education activities for 1 academic group per 1 room. total students were 718 persons.

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3.2 Research Instruments

Research instruments are consisted of questionnaire and effectiveness evaluation. a questionnaire is used for collecting data while effectiveness evaluation is for measuring learner's achievement of teacher's and students. Research instruments are shown as follows:

3.2.1 Questionnaire was used for collecting data on environment in school and community consisted of personal data of teachers and schools and data on integrated learning management and learning data of school.

3.2.2 Efficiency evaluation was done to assess learning achievement of teachers and students, pre-test and post-test with integration environmental education model with academic groups in Basic Schools. It is consisted of learning achievement in environmental education and 8 academic groups.

3.3.3 Steps for constructing and verifying instruments as following:

1) The researcher studied data from relevant documents on conceptual trends, theories and relevant researches to determine structure and variables needed to measure and model for constructing questionnaires.

2) The constructed questionnaire was taken to the advisors for verification and correction later.

3) The corrected and improved questionnaire was rechecked for accuracy by Professor Panya Mankep, Ph.D.; Professor Chavit Jitvijarn, Ph.D. and Colonel Prachum Mathuramon, Ph.D.

4) Making improvement based on the advice of scholars

5) Questionnaire was tested with teacher and students total 100 persons together in Don Toom area, Nakhon Pathom province for 2 years such as Kong Thong Vittaya and Wat Sanga Ngam School. The researcher collected data of the surrounding school and community.

6) The researcher taken the test questionnaire for quality analysis by calculating the reliability of a questionnaire based on Cronbach's alpha coefficient.

7) Researcher improved results from analysis and made into complete questionnaires based on structure of questionnaire for further use.

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3.3 Steps and Environmental Education Process

Steps and environmental education is consisted of 4 steps as follows: first in school and community environment education, learning integration management, and students learning. Second step building integrated environmental education with academic group for teacher basic education. Third step in arranging environmental education for teacher basic education and fourth assessing effectiveness of integrated environmental education model with academic group for teacher in Basic Education School with the following research methodology as follows:

3.3.1 Environmental Study is consisted of the study of data, first in school and community environment, second in learning integration management and finally, students self-learning through the following methods:

1) Documentary searching by studying from documents, research reports, articles, journal and relevant thesis

2)Asking sample questions through questionnaires to collect general data on school and community environment, learning management and student's learning on environmental education

3.3.2 Steps for constructing integrated environmental education model with ระดับacademic groups consisted of 2 minor steps as follows:

1) Data synthesis of school and community data, integrated learning management and student's learning in environmental education

2) Building integrated environmental education model with academic group for Teacher Basic Education

3) Steps for arranging environmental education for teacher basic education with participated meeting to develop teacher for integration with academic groups.

3.3.3 A.I.C (Appreciation - Influence - Control) is consisted of the following steps:

Step 1: Building appreciation or A per the following details. Researcher built understanding and knowledge in environmental education with 8 academic groups and made joint agreement to find integration model as well as review the fact and vision the desires picture in mind.

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Step 2: Building guideline s for environmental education integration with 8 academic groups by sharing idea among teachers participated in environmental education or Influence or I . Determine alternative in environmental education integration to build model with 8 academic groups.

Step 3: Determine guideline and Control or C to specify operation plan and conclude environmental education integration with 8 academic groups with contents in 4 areas:

Part 1: Environmental Education contents are giving the meaning of environmental education, principles and objectives of environmental education.

Part 2: Contents on 8 academic groups consisted of Thai language, sciences, mathematics, social studies, religion and culture, heath and physical education , art, vocational and technology and foreign languages.

Part 3: Integration contents are to learn the meaning of integration, significance value of learning integration. Features of good integrated learning, arranging integration and method and steps for arranging integrated learning.

Part 4: Linking 8 academic groups together with environmental education through Web Model.

Arranging environmental education with 8 academic groups can be done through the following activities to allow teacher to achieve the objectives of organizing activities. Operation steps area done as follows:

1) To make all teachers know about integrated Environmental Education model and 8 academic groups with the emphasis on all teachers participates in the activities, knowing and doing and solving problems. It is way to give everyone the opportunity to participate in the activities by allowing them to express idea, practice and brainstorm of all teachers through activities and listening to lecture from the expert in environmental education with integration and 8 academic groups.

2) Determine duration for environmental education by considered from contents and activities in each operation.

3) Determine roles of speaker as being the leader of the meeting and the lecturer by choosing the expert in environment and integration, able to build contents in environmental education and integration ready to lecture for teacher to understand

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well. Besides having experiences in the subject, he must be able to transmit knowledge well.

4) Determine teacher's roles as the assistance in organizing environmental education and coordinating work with group speaker in environmental education based on process of planning for environmental education as well as being the observer with the participation of all meeting participants

3.4 Data Collection

Data was collected through 750 questionnaires given to teachers and students at school during the environmental education at school and community and evaluation of integrated environmental education model with 8 academic groups by applying with students in the real situation

3.5 Data Analysis

Data analysis was done with mixed methodology between qualitative and quantitative. Qualitative analysis was applied in the construction of integrated Environmental Education with academic group for teacher basic education and steps for arranging environmental education. Qualitative analysis was used for studying environmental education and evaluating effectiveness of integrated environmental education with academic groups in the real situation. The standard result evaluation on environmental education and academic group used for measuring level was invented by Likert scale (Cary D.Borich and Susan K.Madden,1997:35) and showed the following criteria .

5.00 - 4.21 = very good learning results
4.20 - 3.41 = good learning results
3.40 - 2.61 = moderate learning results
2.60 - 1.81 = bad learning results
1.80 - 1.00 = very bad learning results

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3.5.1 Qualitative Analysis

Quantitative analysis was done in 2 steps as follows: first to build integrated Environmental Education with 8 academic groups for teachers in basic education. Second step is to arrange environmental education for teachers in basic education with analysis to extract data for finding conclusion and arranging cause-based data.

3.5.2 Quantitative Data Analysis

Quantitative Data Analysis was done in 2 steps as follows: first to study school and community Environmental Education. Second step is to evaluate effectiveness of integrated environmental education with 8 academic groups for teachers in basic education.

3.6 Research Statistics

3.6.1 Quantitative research was conducted to analyze and extract data for finding conclusions and arranging data for cause-based presentation

3.6.2 Qualitative research was done with contents analysis to analyze data, contents and relevant documents. A questionnaire was being used as descriptive analysis to explain data with Mean, Frequency and Percentages. As for comparison in effectiveness, it was done with t-test.(Gopal K.,1993: 27)

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CHAPTER IV
RESULTS

The research objectives on integration of Environmental education for teachers in basic education in schools were to design and evaluate effectiveness of Integration environmental education model for teacher in basic education. It consisted of the following 4 steps:

4.1 Current Environmental Education

4.2 Integrated Environmental Education Model with academic group

4.3 Environmental Education Activities

4.4 Evaluation on effectiveness of Integration of Environmental Education model with academic group for teachers of basic education

4.1 Current Environmental Education

Environmental education in the current situation is defined as the study of general data on school and community environment, integrated learning management and students learning environmental education. This research consisted of the study in 6 surrounding conditions in first, individual data, second, environment in school and community, third, integrated learning management, fourth, students learning, fifth, students' learning resulting environmental education and finally, problems, obstacles and recommendations. Research results are presented as follows:

4.1.1 Individual Data

1) Individual data of teachers consisted of 2 parts:

Teachers' personal data were sex, age, religion, period teaching, academic groups, officials' employment, teaching duration, educational levels, salary, family status, family members and school location.

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Table 1 Number and Percentage of Sample Groups, Classified to Teacher and Student

Sample Groups	Number	Percentage
Teachers	142	35.50
Students	258	64.50
Total	400	100

As shown in table 1, research results indicated that participants were 142 teachers (35.50%) and 258 students (64.50%). After reviewing documents of Nakhon Pathom Educational Office District 2, for the year 2005 in the districts of Sampra, Nakhon Chaisri, Phuttamonthon and Banglen, findings indicated that participants consisted of 142 teachers (35.50%) and 258 students (64.50%) . In all 4 districts together, there were totals of 144 schools, 2,484 teachers and 55,654 students together.

Table 2 Personal Data of Teacher During Period of Environmental Education Classified to Gender and Religion

Gender and Religion	Number	Percentage
1. Gender		
1.1 Males	39	27.46
1.2 Females	103	72.54
2. Religion		
2.1 Buddhist	141	99.30
2.2 Christian	1	00.70
Total	142	100

As shown in table 2, research results indicated that 39 teachers were males 27.46 year old, followed by 103 teachers (72.54%). And 141 teachers were Buddhists (99.30), 1 Christian (00.70%) which coincided with the survey of Banglen district, Nakhonpathom province that found many Buddhists in the area because Buddhism is the National religion with religious ceremonies ties to culture and tradition such as Buddhist Makabucha Day, Buddhist Visakha Bucha Day, Buddhist Lent Day, including the monk ordain ritual when Thai man reach 21 years of age which is

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considered long time tradition in many areas of Nakhonpathom province. There are few Christians and Islam.

Table 3 Teacher Personal Data During Period of Environmental Education Classified to Age

Age	Number	Percentage
Lower or equal to 30 years	17	11.97
31-40 years	17	11.97
41-50 years	65	45.77
Over 50 years	43	30.28
Total	142	100.00

$\overline{X}$ =45.10 S.D. = 9.13

As shown in table 3, research results indicated that 65 teachers aged between 41-50 years, followed by 43 teachers older than 50 years old (30.28%) and 17 teachers younger than or equal to 30 years old and 17 teachers aged between 31-40 years old (11.97%).

Table 4 Personal Data of Teacher During Period of Environmental Education Classified to Teaching Period

Teaching Period	Number	Percentage
Period 1 (Pratom 1-3)	25	17.61
Period 2 (Pratom 4-6)	34	23.94
Period 3 (Mattayom 1-3)	39	27.46
Period 4 (Mattayom 4-6)	17	11.97
Teach more than 1 period	27	19.01

As shown in table 4, research results indicated that teachers mostly taught in class, next period 2 (23.94%) and taught more than 1 period (19.01%), respectively. Form the area survey, it was found that total schools in Nakhon Pathom Educational Office District 2 amounted to 144 schools with 2,484 teachers and 55,654 students

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(Nakhonpathom Educational Office District 2 , 2005). When making comparison in number of teacher one teacher per 23 students, teachers had no choices , but to teach more than 1 period.

Table 5 Personal Data of Teacher During Period of Environmental Education Classified to Academic Groups

Academic Groups	Teaching Academic Group		Non-teaching Academic Group	
	Number	Percentage	Number	Percentage
Thai Language	57	40.14	85	59.86
Mathematics	46	32.39	96	67.61
Sciences	27	19.01	115	80.99
Social , Religion and Culture	31	21.83	111	78.17
Art	10	7.04	132	92.96
Health and Physical	19	13.38	123	86.82
Occupation and Technology	33	23.24	109	76.76
Foreign Languages	18	12.68	124	87.32

As shown in table 5, research results indicated that participants were Thai languages, teachers (40.24%), next, mathematic teachers (32.39%), Occupation and technology (23.24%), respectively. Interviewing results of instructor (Virut Pirombiew of Wat Veruvanaram School) indicated that number of school instructors were not enough as compared to all 8 academic groups. Then, 1 teacher must teach many subjects mostly in Thai Language which is the basic education subject for students.

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Table 6 Personal Data of Teacher During Period of Environmental Education Classified to Teaching Experiences

Teaching Experiences	Number	Percentage
Lower or equal to 5 years	30	21.13
6-10 years	15	10.56
11-15 years	15	10.56
16-20 years	20	14.08
Over 20 years	51	35.92

$\overline{X}$ = 17.03 S.D. = 10.73

As shown in table 6, research results indicated 51 teachers had teaching experiences over 20 years (35.92%), followed by 30 teachers with experiences lower or equal to 5 years (21.13%) and 20 teacher with 16-20 years teaching experiences (14.08%), respectively.

Table 7 Personal Data of Teacher During Period of Environmental Education Classified to Year of Teaching Services

Year of Teaching Services	Number	Percentage
Lower or equal to 5 years	15	10.56
6-10 years	6	4.23
11-15 years	10	7.04
16-20 years	17	11.97
Over 20 years	86	60.56

$\overline{X}$ = 22-11 S.D. = 9.98

As shown in table 7, research results indicated that The majority of teachers (60.56%) and 22.11 years of average officials employment, followed by 17 teachers for 16-20 years officials employment (11.97%) and 15 teachers with officials employment of 5 years or less (10.56%), respectively.

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Table 8 Personal Data of Teacher During Period of Environmental Education Classified to Educational Level

Educational Level	Number	Percentage
Bachelor Degree	122	85.90
Master Degree	20	14.10

As shown in table 8, research results indicated that 112 teachers graduated with Bachelor Degree (85.90%) and 20 teachers completed Master Degree (14.10%). From the interview with Mr. Prasart Sangsawang, the Director of Banglen Vittaya School, Banglen district, Nakhon Pathom province, findings showed that among 50 teachers of Banglen School, The majority of them graduated with Bachelor Degree. Many of them were senior with strong teaching experiences . In the past, teachers only graduated with Bachelor Degree mostly and able to pass teacher exam in most of Educational District office for them to be appointed as officers in Basic Education. Then, most of them only completed Bachelor Degree.

Table 9: Personal Data of Teacher During Period of Environmental Education Classified to Monthly Incomes

Monthly Incomes	Number	Percentage
Lower or equal to 10,000 baht	19	13.38
10,000-20,000 baht	19	13.38
20,001-30,000 baht	70	49.30
30,001-40,000 baht	21	14.79
Over 40,000 baht	3	2.11

As shown in table 9, research results indicated that 70 teachers received salary between 20,001 baht -30,000 baht (49.30%), followed by 21 teacher earned 30,001-40,000 baht (14.79%) and 19 teachers earned lower than or equal to 10,000 baht and 10,000-20,000 baht (13.38%), respectively.

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Table 10 Personal Data of Teacher During Period of Environmental Education Classified to Household Member

Household Member	Number	Percentage
1-2 persons	13	9.15
3-4persons	69	48.59
5-6 persons	39	27.46
more than 6 persons	21	14.79

$\overline{X}$ = 4.42 S.D. = 1.83

As shown in table10, research results indicated that teachers had 3-4 family members (48.59%) , followed by 5-6 family members (27.46%) and family members over 6 persons (14.79%), respectively. It coincided with the area survey of Banglen district, Nakhon Pathom province to show that many families in the area consisted of father, mothers and children because most of them settle their own smaller families, thus reducing numbers of families in the area.

Table 11 Personal Data of Teacher During Period of Environmental Education Classified to Residential District

Residential District	Number	Percentage
Sam Pran	58	40.85
Nakhon Chaisri	18	12.68
Phuttamonthon	31	21.63
Banglen	35	24.65

As shown in table 11, research results indicated 58 teachers lived mostly in Sam Pran (40.8%), followed by 35 teachers lived in Banglen district (24.65%) and31 teachers (21.63%) lived in Phuttamonthon district, respectively.

2) For students' personal data , they were consisted of data in sex, age, religion, family members, residential district and period of students.

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Table 12 Personal Data of Student During Period of Environmental Education Classified to Gender

Gender	Number	Percentage
Males	94	36.43
Females	164	63.57
Total	258	100.00

As shown in table 12, research results showed that individual data of students came mostly from 164 females students (63.57%) and 94 males (36.43%). Documents review from Nakhon Pathom Educational Office District 2 indicated that student in the year 2005 were 29, 519 males and 26,135 females for total of 55,654 students.

Table 13 Personal Data of Student During Period of Environmental Education Classified to Age

Age	Number	Percentage
10-12 years	113	43.80
13-14 years	55	21.32
more than 14 years	90	34.88

$\overline{X}$ = 13.51 S.D 2.06

As shown in table 13, research results indicated that The majority of teachers (43.80%) had average age of 13.51 years, next over 14 years (34.88%) and 55 students aged between 13 years -14 years , respectively.

Table 14 Personal Data of Student During Period of Environmental Education Classified to Religion

Religion	Number	Percentage
Buddhist	255	98.84
Christian	2	.78
Islam	1	.39

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As shown in table14, research results indicated that 225 teachers were Buddhists family members (98.84%) , followed by 2 Christians (.78%) and 1 Islam (.39 %), respectively. It coincided with the documents revision in education, religion and culture of group work plan and monitoring results of the Office of Education, Banglen district, Nakhon Pathom as well as being discovered that people of Banglen district mostly were Buddhists.

Table 15 Personal Data of Student During Period of Environmental Education Classified to Household Member

Household Members	Number	Percentage
1-2 persons	7	2.71
3-4 persons	106	41.09
5-6 persons	88	34.11
More than 6 persons	57	22.09

$\overline{X}$ = 5.02 S.D. = 1.75

As shown in table15, research results indicated that The majority of students (41.09%) had family members average 5.02 persons, followed by 5-6 persons (34.11%) and more than 6 persons (22.09%),respectively.

Table 16 Personal Data of Student During Period of Environmental Education Classified to Residential District

Residential District	Number	Percentage
Sampran	34	13.18
Nakhon Chaisri	83	32.17
Phuttamonthon	65	25.19
Bang Len	76	29.46

As shown in table16, research results indicated that 83 students lived in Nakhon Chaisri District (32.17%), followed by 76 students (29.46%) lived in Banglen

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District and 65 persons (25.19%) lived in Phuttamonthon district , respectively. Documents review from Nakhon Pathom Policies and Planning Office , District 2 indicated that Sampran district had a total of 22,638 males and female students . Nakhon Chaisri district had total 13, 091 males and females while Phuttamonthon district had total 7,828 males and females students and Banlen district had total of 12,097 males and females students. From primary data, research findings indicated that many students resided in the area because it was convenience for them to travel.

Table 17 Personal Data of Student During Period of Environmental Education Classified to Class Period

Period	Number	Percentage
Level 1 (Prathom 1-3)	2	.78
Level 2 (Prathom 3-6)	107	41.47
Level 3 (Mattayom 1-3)	65	25.19
Level 4 (Mattayom 4-6)	84	32.56

As shown in table17, research results indicated that 107 student were in period 2 (Pratom Suksa 3-6) (41.47%), followed by 84 students (32.56%) in period 4(Mattayom Suksa 4-6). Total 65 students were in period 3 (Mattayom Suksa 1-3) (25.19) , respectively.

4.1.2 School and Community Environment

School and community environment is consisted of data in soils, water, air, energy, plants, animals, cultural concepts, group gathering culture, behavioral culture and cultural objects.

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Table 18 General Environmental Data in School and Community on Soil

Soils	Number	Percentage
Type of Soils		
Loose soil	241	60.25
Clay	139	34.75
Sandy soil	20	5.00
Land Use		
Agriculture	311	77.75
Residential	68	17.00
Industry	21	5.25
Soils Pollution Problems		
Alkaline soils	18	4.50
Heavy acid soils	37	.925
Acid soils	99	24.75
Soils with chemical residue	246	61.50

As shown in table 18, research results indicated that sample soils were loose soils and mixed with clay which coincided with the area survey of Banglen district, Nakhompathom province and nearby area. It was found that the majority of people made their livings from agriculture, growing field crops, rice and fruits trees as well as raising animals. Soils in the area which are suitable for cultivation consisted of loose soils and clay depended on type of cultivation. It coincided with the interview of agricultural experts (Mr. Somkiet Soonthornumpai) of Bang Lagum district, Banglen district, Nakhonpathom province, followed by 34.75% clay and 5.00% sandy soils, respectively. For land usage, sample soils of 77.75% used soils in agriculture, followed by 17.00% for shelters and 5.25 used for industry. Problems from soils pollution showed 61.50% with chemical residue in soils. Next 24.75% showed problems in acid soils and 9.25% with heavy acid soils, respectively.

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Table 19 General Data on School and Community on Water Supplies

Water	Number	Percentage
Water Source for Use		
River and canal	38	9.50
Tab water	175	43.75
Underground water	187	46.75
Usage of Water Source		
Agriculture	224	56.00
Household consumption	143	35.75
Industry	33	8.25
Cause of Water Pollution		
Household waste	45	11.25
Garbage	154	38.50
Industrial waste	151	37.75
Agriculture	50	12.50

As shown in table 19, research results indicated that The majority of participants 46.75% used underground water, next tab water 43.75% and 9.50% used water from river and canals, respectively. For water usage, 56.00 percents of participants used water for agriculture, next 36.75% for household consumption and 8.25% in industry, respectively. Water pollution caused by garbage 38.50%, next 37.75% from industrial waste water and 12.50% from agriculture, respectively.

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Table 20 General Data on Air Quality in School and Community

Weather	Number	Percentage
Cause of Air Pollution		
Foul odor	85	29.31
Excess chemical mixture	23	7.93
Dusty	114	39.31
Black smoke and various chemicals from	68	23.45
Automobile Sources of Air Pollution		
Industrial factory	115	28.75
Pesticides	64	16.00
Lump literate road	95	23.75
Automobiles	126	31.50

As shown in table 20, research results indicated that 72.50%of research areas had encountered air pollution problems , next 6.50% had not encountered air pollution , and 21.00 % unknown, respectively. For the cause of air pollution, 39.31% showed problems from dust, next 29.31% from foul odor and 23.45% from black smoke and chemical from automobiles, next 28.75% from industry and 23.75% from lump laterite road, respectively.

Table 21 General Environmental Data on Energy in School and Community

Energy	Number	Percentage
Energy Used		
Petroleum	47	11.75
Electricity	345	86.25
Cooking gas	8	2.00
Problems from Energy Used		
Expensive price	338	84.50
Hard to find	13	3.25
Less energy	49	12.25

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As shown in table 21, research results showed 86.25% mostly in electricity energy used, next 11.75% used fuel and 2.00% for cooking gas, respectively. Problems caused by high prices 84.50%, next 12.25% with less energy and 3.25% hard to find.

Table 22 General Environmental Data on Economic Crop in School and Community

Economic Crop	Number	Percentage
Economic Crops Grown		
Rice	248	62.00
Fruits	100	25.00
Vegetables	52	13.00
Vegetables Grown		
Growing	381	95.23
Not growing	19	4.75
Most Grown Garden Vegetables		
Chilly	160	37.00
Holy basil	124	32.55
Lemon grass	116	30.45

As shown in table 22 research results indicated that economic crops mostly grown are rice 62.00 %, next 25.00% growing fruits and 13.00% growing garden vegetables which coincided with the area survey. It was found that The majority of locals at Banglane district, Nakhonpathom province from agricultural occupation with area 318,000 rais for agriculture . Total 227,000 rais reserved for rice paddies and 3, 500 rais for rice fields. Estimated 12,000 rais were used for growing garden vegetables by total 92.25% of participants and 4.75% were not growing any vegetables. Most widely grown garden vegetable was chili 37.00%, followed by holy basil 32.55% and 30.45% on lemongrass, respectively.

From documents review the project to develop students, schools and communities with participation through Environmental Education for Integration. Regarding school and community economic crops, findings revealed that The majority of locals at Banglen district, Nakhon Pathom province made their livings

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mainly from agricultural occupation and growing vegetables and fruit trees which generated incomes for farmers. Agricultural products were processed for added value. Many products have been featured as OTOP products of Banglen district, Nakhon Pathom district which turn agricultural occupation into added value occupation and generated incomes for Banglen District locals.

Table 23 General Environmental Data on Economic Animals

Economic Animals	Number	Percentage
Community Economic Animals		
Pigs	106	26.50
Chicken	205	51.25
Ducks	49	12.25
Raising Animals in Household Consumption		
Yes	350	87.50
No	50	12.50
Type of Animals for Household Consumption		
Chicken	205	51.25
Pigs	106	26.50
Ducks	49	12.25
Others	40	10.00

As shown in table 23, research results indicated most locals raised chicken as economic animals (51.25%). From the area survey in Nakhonpathom district area 2, findings showed that cattle raising in the districts of Nakhonpathom consisted of chickens, pigs, cows, and sheep. Geese, fishes and breeding shrimps . Next locals raised pigs (26.50%) and ducks (12.25%), respectively. Animals were raised for household consumption (87.50%) and non-household consumption (12.50%). The most animals raised were chickens (51.25%), followed by pigs (26.50%) and ducks 12.25% and others (10.00%), respectively.

From documents review the project to develop students, schools and communities with participation through Environmental education for integration on

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December 30, 2003, findings revealed that local people of Banglane district, Nakhon pathom province raised ducks, chickens, pigs, cows, buffaloes, sheep, geese, fishes and shrimps. Cattle raising is the occupation generated good incomes for locals at Banglen district. Therefore, the government has given good support for farmers such as treating animal diseases and distributed vaccination.

Table 24 General Environment Data on Cultural Concepts

Concept Culture	Number	Percent
Association Between Human and Local Environment		
You are part of local environment	347	86.75
You must built technology to control nature	14	3.50
All things on earth are mortal	38	9.50
Only god determine fate of living creatures and earth	1	.25
Decisions-Making on Daily Activities		
Self-decision	94	23.50
Consulting with experts before making decision	112	28.00
Members decisions mainly	73	18.25
Making decision with only concern in own interest	17	4.25
Decisions based on situation	103	25.75
Not interested in making decision	1	.25

As shown in table 24, research results indicated association between human and environment, The majority of participants accepted as being part of local environment (86.75%), next all things on earth are mortal (9.25%) and demand foe technology to control nature (3.50%), respectively. For decisions-making, The majority of participants consulted with experts before making-decisions (28.00%), next (25.75%) made decisions based on situation and (23.50%(made self-decisions, respectively. From documents review the project to develop students, schools and communities regarding conceptual culture, findings revealed that association between human and local environment created bondage and depended on each other because human needs good surrounding for existence. This has created environmental

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conservation when human became part of environment. In other point of view, all creatures are parts of nature. Then, human and other living creatures must exist on the equilibrium base. Since human conscious and ability can determine behavior leading to creativity or destruction (Vinai Veeravattananon,1993: 2) human should be specified by nature to conserve energy together for being environmental basis.

Table 25 General Data on Group Gathering

Organization Culture	Number	Percentage
Solving Family Quarrel		
No hard feelings	280	70.00
Parents intermediaries	63	15.75
Relatives intermediaries	22	5.50
Legal channel	6	1.50
Other approaches such as come to the same agreement	29	7.25
Solving Family Conflict		
No hard feelings	95	23.75
Community senior intermediaries	143	35.75
Decide by community leader or committee	79	19.75
Legal channel	64	16.00
Other methods	19	4.75

As shown in table 25, research results indicated that most participants(70.00%) stopped their family quarrels without hard feelings, next parents intermediaries (15.75%) and (7.25%) ended quarrels by themselves. For community quarrels, (35.75%) asked for senior intermediaries, next decided to stop the quarrel (23.75%), and (19.75%) asked community leader or committee to referee (19.75%), respectively.

From documents review the project to develop students, schools and communities with participation through environmental education for integration, findings revealed that group gathering of people in Banglane district, Nakhonpathom province found local economic system as housewives gatherings, making local

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products to generate incomes for local community such as making local sweets for local products , to generate incomes for locals. It is done to reduce conflicts and solve quarrels within the family and community of Banglen district. Tradition and tour sites are being arranged as tourist attractions to publicize local culture and tradition.

Table 26 School and Community Environment on Behavior

Behavior Culture	Number	Percent
Daily Expenses		
Shelters	46	11.50
Foods	160	40.00
Clothes	5	1.25
Education	119	29.75
Facilities such as mobile phone	70	17.50
Savings		
Bank	284	71.00
Cooperative	62	15.50
Bond	1	00.25
Save in piggy bank	53	13.25

As shown in table 26, research results indicated that participants spent most money on foods (40.00%), next on educational expenses (29.75%) and on facilities (17.50%), respectively. For savings, most participants, saved their money at Bank (71.00%), next saved at Cooperative Savings (15.50%). Other participants saved their monies in piggy Bank (13.25%), respectively. Findings from areas survey in local behavior at Banglen district regarding personal expenses indicated that local people are farmers mostly which made incomes from agricultural inadequate. It is only enough for daily livings and expenses in the group only. Only few families may have excess money from current occupation. Local community saved their monies with the Bank mostly because it is the most secure method and guarantee for their monies. Many local residences of Banglen district, Nakhon Pathom Province have similar ideas about behavior in the community from living in the same place since birth.

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Table 27 School and Community Environment on Cultural Objects

Object culture	Number	Percentage
Home or Shelter Type		
Single home	277	69.25
Commercial building	22	5.50
Townhouse / Row house	86	21.50
Other type such as flat or condominium	15	3.75
Home or Shelter Rights		
Own home	277	69.25
Welfare house	27	6.75
Relatives	31	7.75
Rented house	53	13.25
Mortgage with financial institute	12	3.00

As shown in table 27 research results indicated that The majority of participants lived in single homes (69.25%), next lived in Townhouses or row house (21.50%), and 5.50% lived in house or commercial building, respectively. For homeowner rights, The majority of them (69.25%) owned their homes, next, (13.25%) own homes or rented house and participants (7.75%) lived with relatives, respectively.

From area survey at Banglen district, Nakhon Pathom province discovered that The majority of locals at Banglen district, Nakhon Pathom province lived in single home as typical style of houses in rural area with elevated floor.

4.1.3 Integration Learning Management

Integrated learning management is consisted of data in learning management as follows:

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Table 28 Integrated Learning Management Classified to Student's Qualifications

Students Qualification	Number	Percentage
Having responsibility	50	12.50
Behaving as learning individual	10	2.50
Having good relationship with teacher and friends	14	3.50
Every number	326	81.50

As shown in table 28, research results revealed that many participants preferred students to have all qualification stated (81.50%), next preferred responsibility (12.50%) and (3.50%) preferred students with good relationship with teachers and students.

Table 29 Integrated Learning Management Classified to Problems in Integrated Learning Management

Problems in Integrated Learning Management	Number	Percentage
Non-qualified teacher	48	12.00
Inadequate teaching media	123	30.75
No education guidance	8	2.00
No students participation	63	15.75
No problem	158	39.50

As shown in table 29, research results revealed that many participants answered with no problems in integrated learning (39.50%), next lack teaching media (30.75%) and (12.75%) answered with never participated in activities, respectively. This coincided with the research of educational research division, ministry of education, 2003). For learning media, schools had inadequate teaching media to support demand and mostly out of date media and few learning sources.

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Table 30 Integrated Learning Management Classified to Curriculum Application

Proportion of Curriculum	Number	Percentage
100 : 0	11	2.75
90 : 10	47	11.75
80 : 20	159	39.75
70 : 30	170	42.50
Unknown	13	3.25

As shown in table 30, research results revealed that most schools of participants used curriculum ratio of 70:30 (42.50%), next, 80:20 (39.75%) and 90:10 (11.75%) respectively.

Table 31: Integrated Learning Management Classified to Proportion on Learning Plan Management

Proportion of Learning Plan Management	Number	Percentage
100 %	232	58.00
75 %	62	15.50
50 %	25	6.25
25 %	40	10.00
0 %	41	10.25

As shown in table 31, research results revealed that most schools of participants arranged ratio for learning plan 100% (58.00%) , next (15.50%), and (10.25%) without ratio, respectively. This finding coincided with the research of Education Research Division, Ministry of Education (2002:89). For planning learning management, many schools had followed the practice for Basic Education by putting the emphasis on teaching morals and ethics to students.

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Table 32: Integrated Learning Management in Environmental Education

Integrated Learning Management in Environmental Education	Number	Percentage
Have	262	65.50
Have not	138	34.50

As shown in table 32, research results revealed that most schools of participants managed Integrated environmental education with academic groups (65.50%). School of participants has not managed Integrated environmental education with academic groups (34.50%).

Table 33 Integrated Learning Management Classified to Learning Activities Model

Learning Activities Model	Number	Percentage
Building knowledge source in school	208	52.00
Arranging academic camp for students	29	7.25
Arranging academic activities to promote learning	163	40.75

As shown in table 33, research results revealed that most schools of participants arranging learning activities to build learning source at school (52.00%)., next arranging academic activities (40.75%), and arranging academic camp (7.25%), respectively.

Table 34: Integrated Learning Management Classified to Activities Model Preferred by Students

Activities Model Preference	Number	Percentage
Building knowledge source in school	100	25.00
Arranging academic camp activities for students	135	33.75
Arranging academic activities to promote learning	165	41.25

As shown in table 34, research results revealed that most studentspreferred activities to promote learning (41.25%). Next, students preferred academic camp

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activities (33.75%). and enjoyed building knowledge source in school (25.00%), respectively.

Table 35 Integrated Learning Management Classified to Problems on Learning Activities

Problems on Learning Activities	Number	Percentage
Teachers failed to see value of activities	46	11.50
No time to participate on activity	183	45.75
Non-favored curriculum to activities	91	22.75
Unable to apply media to arrange activities	80	20.00

As shown in table 35, research results revealed that most schools were facing problem of students had no time to participate on activities (45.75%). Next,. problem on non-favored curriculum to activities (22.75%) and teacher was unable to apply media to arrange activities (20.00%), respectively.

Table 36: Integrated Learning Management Classified to Media and Technology

Media and Technology	Number	Percentage
Books	111	27.75
Computer	182	45.50
Visual aids	44	11.00
Printing materials	48	12.00
Natural media	15	3.75

As shown in table 36, research results revealed that most schools managed integrated environmental education with media and computer (45.50%). next, with books (27.75%) and printing media (12.00%), respectively. This finding coincided with the research of department of curriculum and instruction development that showed many schools used computer in school teaching.

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Table 37 Integrated Learning Management Classified to Application of Media and Technology

Problem of Media and Technology Application	Number	Percentage
Teachers failed to recognize the value of media	66	16.50
Teachers are incapable of producing media	91	22.75
School lack of budget to buy media	243	60.75

As shown in table 37, research results revealed that many schools were short of budget to purchase learning media (60.75%). Next, school teachers were unable to produce media (22.75%) and school teachers failed to recognize the value of media (16.50%).

Table 38 Integrated Learning Management Classified to Numbers of Teachers

Number of School Teacher	Number	Percentage
Not enough	263	65.75
Enough	137	34.25

As shown in table 38, research results revealed that many schools did not have sufficient number of teachers (65.75%) and school of participants had sufficient number of teachers (34.25%).

Table 39 Integrated Learning Management Classified to Teaching Methods

Teaching Method	Number	Percentage
Lecture	235	58.75
Group discussion	52	13.00
Student self -searching	100	25.00
Using natural teaching media	31	3.25

As shown in table 39, research results revealed that many teachers lectured (58.75%) Next on student self-searching (25.00%), and on group discussion (13.00%), respectively.

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Table 40 Integrated Learning Management Classified to Ideal Teacher

Ideal Teacher	Number	Percentage
Be kind and caring for students regularly	166	41.50
Having knowledge and virtue	98	24.50
Being good examples to treat teachers and students well	68	17.00
Be creativity, eager to learn an support school activities	68	17.00

As shown in table 40, research results revealed that ideal teacher must be kind and look after the students well-beings regularly (41.50%). Next, teacher must have knowledge and virtue (24.50%) and being good example to treat other teachers and students well , including being creativity , eager to learn and support school activities (17.00%). respectively.

Table 41 Integrated Learning Management Classified to Problems on Teachers

Problems About Teacher	Number	Percent
Not enough teachers	147	36.75
Non-related qualification	71	17.75
Lack experiences in learning management	74	18.50
Lack spirit of being teacher	39	9.75
Other problems	69	17.25

As shown in table 41, research results revealed that many schools did not have enough teachers (36.75%). Next, teacher had no experiences in learning management (18.50%) and not qualified to teach that subject (17.75%), respectively.

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Table 42 Integrated Learning Management Classified to Learning Process Arrangement

Learning Process Arrangement	Number	Percentage
Learners' center	210	52.50
Curriculum center	58	14.50
Activities center	6	1.50
Media and technology center	11	2.75
Teacher center	24	6.00
Integrated learning	91	22.75

As shown in table 42, research results revealed that many schools based their strategies on students' center (52.50%) . Next, integrated learning (22.75%) and Curriculum Center (14.50%), respectively.

Table 43 Integrated Learning Management Classified to Learning Process Planning

Learning Process Planning	Number	Percent
Determine contents to agree with each subject explanation	107	26.75
Determine objectives to agree with expected learning	198	49.50
results	85	21.25
Study curriculum before planning	10	2.50
No determination or any plans		

As shown in table 43, research results revealed that many schools planned learning process management with objectives coincided with expected learning results (49.50%), next schools planning contents agreeable with each subject (26.75%). School usually arranged process in learning curriculum before planning (21.25%), respectively which coincided with the research results of research unit of the Ministry of Education (2002: 88-89). School had planned integrated learning process to students by determining planning contents to agree with each subject content and the set objectives to coincide with expected learning results.

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Table 44 Integrated Learning Management Classified to Problems on Learning Management

Problems on Learning Management	Number	Percent
Too many students	117	29.25
Students lack of interest	180	45.00
Too much contents	48	12.00
Few hours for learning management	55	13.75

As shown in table 44, research results revealed that many students were not interested in learning (45.00%). Next, school had too many students (29.25%) with less learning hour (13.75%), respectively.

Research findings coincided with documents of the office of academic standard education, Office of basic education committee, Ministry of education had summarized in the following explanation. Effective learning integration management to develop desired trait among learners must receive cooperation from all concerned parties so that personnel can develop knowledge and understanding in the integration Environmental Education learning process. It was made to build good attitude for instructor to recognize learning management values, including knowledge and understanding, limitations and guidelines for improvement. It should build creativity with good administration as well as providing opportunity for instructor to choose proper integration model, academic groups, expected learning results to match own skill. There should be the follow up to provide support, information, materials and equipments for learning and teaching, together with findings cooperation and support from concerned parties and concerned with learners the most.

Research results (Division of Curriculum, Ministry of Education, 2002:101) showed that teachers were not quite certain and understand in learning curriculum, subjects, making plan, not enough time for in-dept study as well a having too much responsibility at the same time, resulting insufficient numbers of teachers. Teachers had no confidence in planning integration learning management for students' basic education.

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Table 45 Integrated Learning Management on Evaluation Results

Evaluation of Results	Number	Percentage
Objective	123	30.75
File	95	23.75
Subjective	60	15.00
Recording behavior	48	12.00
Others (all 4 types)	20	5.00
Not knowing	54	13.50

As shown in table 45, research results revealed that many schools used objective test (30.75%). Next, used file to gather work (23.75%) and school used subjective test (15.00%), respectively.

Table 46 Integrated Learning Management on Implementation of Evaluation Results

Application of Evaluation of Results	Number	Percent
Improving learning management	99	24.75
Being education determinant	63	15.75
Being school quality determinant	77	19.75
Curriculum learning results evaluation	95	23.75
Not knowing	6	16.50

As shown in table 46, research results revealed that most school applied evaluation learning results in the following areas: learning management (24.75%), results evaluation based on curriculum (2.75%) and used as determinant (19.75%), respectively. This coincided with research results of Division of Educational Curriculum, Ministry of Education in finding measurement and evaluation of students' learning results that covered knowledge, skill, morals and values with the application of evaluation results in learning improvement at school.

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Table 47 Integrated Learning Management on Problems of Learning Result Evaluation

Problems of learning result evaluation	Number	Percentage
Teachers lack knowledge and understanding in evaluation of learning results	33	8.25
Teachers without skill in evaluation of learning results	57	14.25
No students involvement in evaluation of learning results	76	19.00
Teachers without skill in evaluation of learning results for students	10	2.50
No problem on learning results	224	56.00

As shown in table 47, research results revealed that many schools had no problems about evaluation of learning results (56.00%). Next, schools had encountered problems in no students' involvement in evaluation of learning results (19.00%) and teachers had no skill in evaluation of learning results (14.25%), respectively.

4.1.4 Student Learning on Environmental Education

Student learning on environmental education is consisted of student's learning results.

Table 48 Students Academic Group Learning results in Cognitive Domain

Cognitive Domain	Mean	Std. Deviation
Having ability to answer learning subjects correctly	3.43	0.67
Having ability to explain learning subjects reasonably	3.50	0.77
Having ability to adapt learning subjects with daily activities	3.60	0.78
Having ability to analyze learning subjects to match each other and in order	3.30	0.75

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Cognitive Domain	Mean	Std. Deviation
Having ability to integrate learning subjects into the same subject	3.45	0.83
Having ability to diagnose learning subjects with standard	3.40	0.90

$\overline{X}$ = 3.45 S.D. = 0.61

As shown in table 48, research results revealed that overall cognitive domain of students was in good standard (Mean 3.45%).

Table 49 Students Academic Group Learning results in Affective Domain

Mind Ability	Mean	Std. Deviation
Perception in learning	3.85	0.77
Thirst for knowledge	3.62	0.84
Recognize benefit and value of learning	3.75	0.80
Arrange learning system properly	3.49	0.78
Able to apply learning until becoming habit	3.46	0.88

$\overline{X}$ = 3.64 S.D. = 0.66

As shown in table 49, research results revealed that overall affective domain of students was in good standard (Mean 3.64%).

Table 50 Students Academic Group Learning results in Psychomotor Domain

Skill Ability	Mean	Std. Deviation
Self- practice in learning subjects correctly	3.65	0.80
Self-application for learning subjects	3.54	0.78
Self-developed for learning subjects	3.37	0.87

$\overline{X}$ = 3.52 S.D. = 0.72

As shown in table 50, research findings showed students psychomotor domain with correct self-practice in learning results (Mean 3.65%), self-application

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for learning subjects (Mean 3.54%) and self-developed for learning subjects (3.7%). The overall learning results were in good standard (Mean 3.52%).

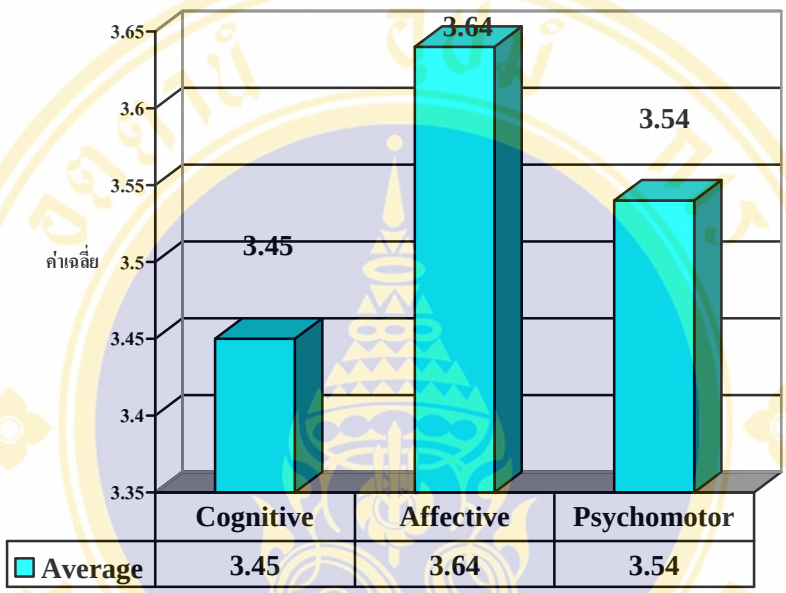

Figure 3 Learning results of students regarding academic groups

Conclusions: Learning results of students regarding academic groups Research findings in Environmental Educational Office at School and community, Nakhon Pathom Educational Office District 2 suggested that learning results of students in Cognitive Domain, Affective Domain and Skills Domain were in good standard.

Students had learning results in academic groups regarding Cognitive Domain, overall in good standard (Mean 3.45).

Students had learning results in academic groups regarding Affective Domain, overall in good standard (Mean 3.64).

Students had learning results in academic groups regarding Skill Domain, overall in good standard (Mean 3.52).

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Table 51 Learning Results of Students in Environmental Education Regarding Awareness

Awareness	Mean	S.D.
Recognize human as part of environment	4.24	0.75
Recognize environmental quality effecting human life quality	4.31	0.78
Recognize earth as shelter for other things not just human	4.37	0.77

$\overline{X}$ = 4.31 S.D. = 0.69

As shown in table 51, research findings showed students learning results in environmental education regarding awareness to recognize human as part of environment (Mean 4.24%), recognize environmental quality effecting human life quality (Mean 4.31%) and recognize earth as a shelter for other things not just human (4.37%). The overall results of environmental education were in very good standard (Mean 4.31%).

Table 52 Students knowledge in Environmental Learning

Knowledge	Mean	S.D.
Increasing knowledge and understanding on natural environment	3.98	0.75
Increasing knowledge and understanding on cultural environment	4.01	0.79
Increasing knowledge and understanding on natural pollution	3.95	0.76

$\overline{X}$ = 3.98 S.D. = 0.67

As shown in table 52, research results revealed that students had increased knowledge, understanding in natural environment (Mean 3.98%), cultural environment (Mean 4.01%) and natural pollution (average 3.95%). The overall environmental results showed knowledge in good standard (Mean 3.98%).

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Table 53 Students Environmental Learning Results in Attitude

Attitude	Mean	S.D.
Quality environment effecting health	4.30	0.77
Quality environment effecting emotion	4.20	0.83
Quality environment effecting spirit	4.10	0.85

$\overline{X}$ = 4.20 S.D. = 0.74

As shown in table 53, research results revealed that overall students' environmental education results in attitude was in good standard (Mean 4.20%).

Table 54 Students Environmental Learning Results in Skill

Skill	Mean	S.D.
Ability to analyze environmental problems directly	3.82	0.77
Solving Environmental problem by himself	3.66	0.83
Able to conserve and develop environment in school and community	3.72	0.85

$\overline{X}$ = 3.74 S.D. = 0.67

As shown in table 54, research results revealed that overall students' environmental education results in skill was in good standard (Mean 3.74%).

Table 55 Students Environmental Learning results in Participation

Participation	Mean	S.D.
Having participated in analysis environmental problems	3.66	0.80
Having participated in solving environmental problems	3.63	0.79
Having participated in school and community environment development	3.80	0.81

$\overline{X}$ = 3.70 S.D. = 0.70

As shown in table55 research results revealed that overall students' environmental education results in participation was in good standard (Mean 3.70%).

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Table 56 Students Environmental Learning results in ability to evaluate

Ability to evaluate	Mean	S.D.
If school or community burn more garbage, in the future the earth will be hotter	4.27	0.87
If human still cuts down trees, the earth will face more catastrophe	4.32	0.88
Application of chemical in agricultural should effect plant and animals daily activities, including health of people in the community	4.28	0.85

$\overline{X}$ = 4.29 S.D. = 0.79

As shown in table 56, research results revealed that overall students' environmental education results in ability to evaluate was in very good standard (Mean 4.29%).

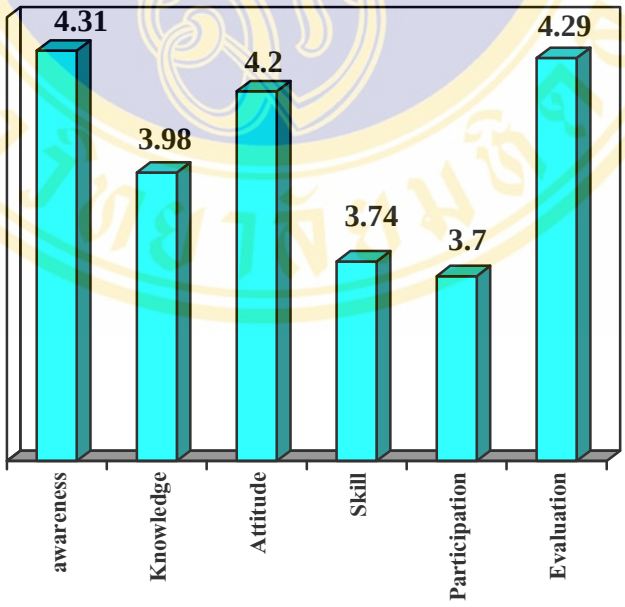

Figure 4: Result of Students Environmental Learning

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From the study of schools and community situation in individual data comprised of individual data, school and community environment, integration learning management, student's learning, environmental education results of students and problems and obstacle and recommendations.

Personal data is comprised of individual data of teachers and students as follows: there were 142 teachers together, 103 females and 30 males with average age of 45.10 years. The majority of them were Buddhists and 39 of them taught (Mattayon Suksa 3) in 3rd period the most, and mostly in Thai language (40.01). Many teachers had teaching experiences for more than 20 years. For students' personal data: there were 248 students, divided into 164 females and 94 males with average age of 13.51 years.

In the integration learning, research results showed that students should possess the following 3 characteristics : first, having responsible, second, being learning individual and last, having good association with teachers and friends. In integration learning management, many of them agreed with having no problems. The ratio of core formula and local curriculum was 70:30. Planning proportion was done 100%. Many schools arranged integration of Environmental Education. Questionnaire respondents wanted school to build knowledge source on site.

The most preferred activities were promoting curriculum. A problem was students had no time to arrange activities. Computer is the most preferred media and technology.

Problems were in insufficient schools budget for buying media, few teachers and taught with lectures. For ideal teachers, they must be kind and considerate. Problems regarding teachers were not enough teachers. Strategies for learning based on learners. Integration for learning showed objectives agreeable with expected learning's results. Problems in integration learning management were students lacked of interest in learning, learning results evaluation with objective test and application of results evaluation to improve learning management. Many of respondents had no problems in evaluation of learning results. For the most environmental problem was dealing with garbage.

Students' learning results in Cognitive Domain , Affective Domain and Skill Domain showed good Mean.

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Students' learning results in Environmental Education as related to awareness and ability to evaluate results showed very good levels. For knowledge, skill and participation, they were at very good levels.

4.2 Integration Environmental Education Model with academic groups

Integration Environmental Education model with 8 academic groups for Teachers of basic education was done in 5 steps as follows: first, analysis of school and community environmental situation. Second involved with school and community data synthesis and third in drafting related to Environmental Education Model with 8 academic groups and fourth in presentation of Environmental Education to the scholars and fifth in the completion of Environmental Education model with 8 academic groups. The construction of Environmental Education model with 8 academic groups put the emphasis on school teachers' participation showed the following research results:

4.2.1 Analysis Environmental situation in School and Community is consisted of the analysis of environmental data derived from the study of school and community, integration learning management and students' learning in academic groups in Basic Education School. Results from the analysis were taken for further analyzing school and community.

4.2.2 Synthesis of General Data on environment in School and Community Synthesis general data on school and community environment was done with data derived from the of school and community surrounding in 4 areas as follows: first environmental situation in the school and community, second on integrated environmental education learning, third on student's learning in academic group and fourth student's learning in environmental education. Data derived from the synthesis were used in the construction of environmental education with other academic groups for Teachers of basic education

4.2.3 Drafting report on Integrated Environmental Education with 8 academic groups

Constructing Drafting report on integrated Environmental Education with 8 academic groups consisted of data from the analysis in 7 units as follows: unit 1 on

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Introduction, unit 2 on Environmental Education, unit 3 on Integration Learning Management, unit 4 on Environmental Education, unit 5 on Environmental, unit 6 on various contents and unit 7 on conclusions. The report was taken to the scholars for validity.

4.2.4 Presenting Scholars with Model on Integration Environmental Education with academic groups for Teacher Basic Education Integration of Environmental Education with 8 academic groups was presented to 3 scholars namely Professor Pannya Mankep, Ph.D.; Professor Chavit Jitvijarn , Ph.D.; Colonel Prachum Mathuramon for more perfect model of integration of Environmental Education with completed academic groups.

4.2.5 Making complete report on Integration of Environmental Education with academic groups. Complete report on integration of Environmental Education with 8 academic groups was done for teachers of basic education after it had been verified by 3 scholars and improved with the following components.

Unit 1 Introduction is mentioned objectives to construct and evaluate integrated environmental education with 8 academic groups as well as bringing conceptual framework, theory, including relevant researches to support this research. Synthesis was also included to build integrated Environmental Education with 8 academic groups for teachers of basic education.

Unit 2 Environmental Study is consisted of preface, teachers and students personal data, school and community data , data on integration learning management, learning results with students in 8 academic groups, students environmental education results , problems and obstacles and recommendations and conclusions.

Unit 3 Integrated Learning Management is consisted of preface, meaning of integration learning management, type of integration learning, model of integration learning, component effecting integration, features of integrated curriculum, Webbed Model, Chart of Webbed Model. Problems from teaching Webbed Model , benefits from teaching integration and conclusion.

Unit 4 Environmental Education is consisted of preface, philosophy of education with environmental education management, steps in constructing the integration of environmental education an academic group, guidelines and approach and results from Integration and results.

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Unit 5 Environment is consisted of Preface, Environment, Cultural Environment, and Association between cultural environment and natural environment, general conditions of Banglane district, Nakorn Pathom province and conclusion.

Unit 6 Various Contents is consisted of Preface basic education curriculum and conclusion.

Unit 7 Conclusion is to summarize integrated Environmental Education model with 8 academic groups for Teachers of basic education.

In Considering educational growth and change (Robert W.Richey, 1968: 77). The researcher had taken the constructed integrated Environmental Education model with 8 academic groups for Teachers of basic education for effective evaluation . Model of integrated environmental education model with 8 academic groups for Teachers of basic education was illustrated in chart 4 as follows:

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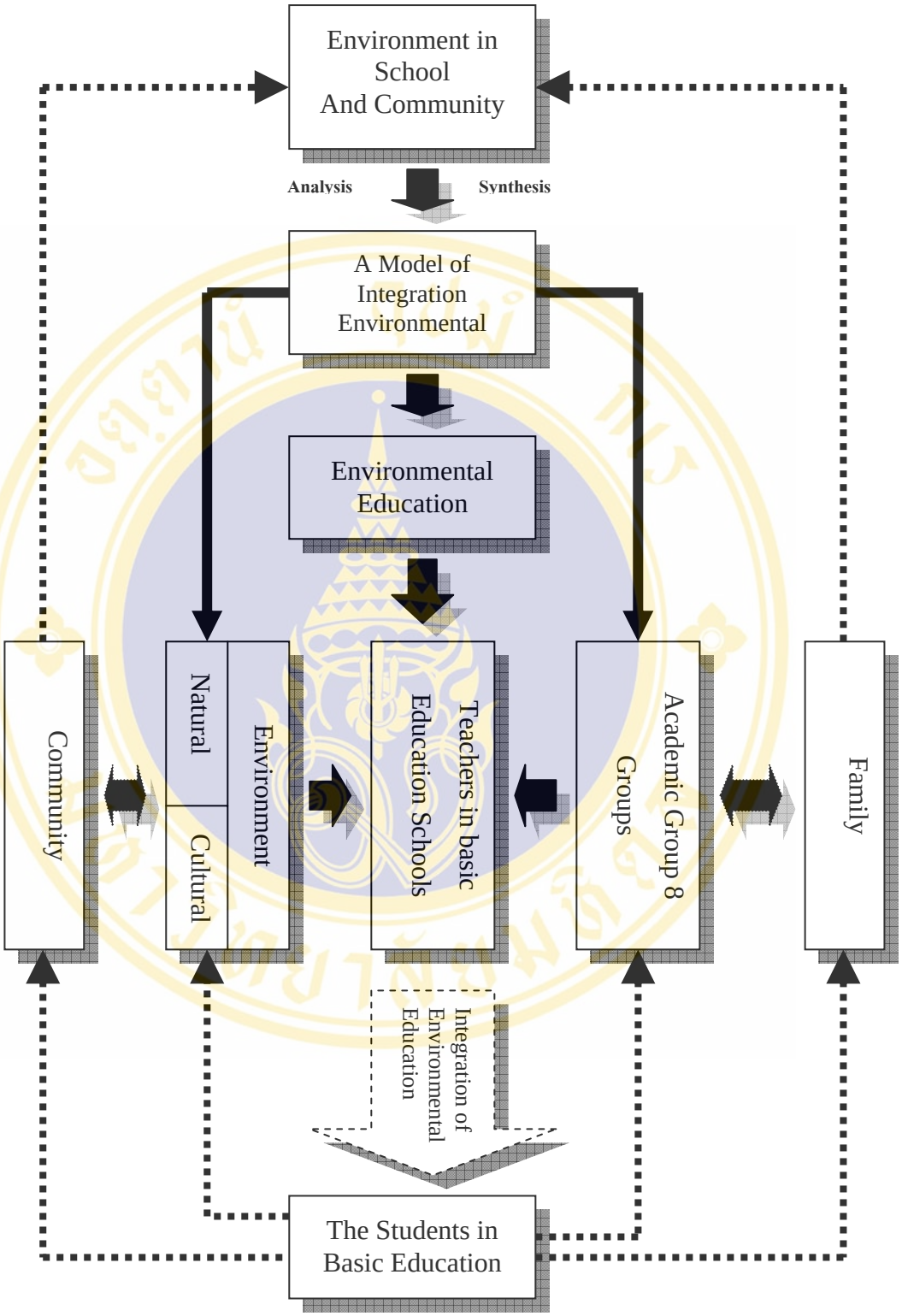

Figure 5 A Model of Integration Environmental Education for Teachers in Basic Education Schools

Source: Synthesis from Research Result

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From figure 4: A Model of integrated environmental education for teachers of basic education involved with the construction and evaluate effectiveness of integrated environmental education model through the transmission of knowledge effectively, including expanding knowledge to the family and community for further sustainable environment.

Before developing teacher to integrate environmental education with 8 academic groups, it is extremely necessary to study environment in school and community environment, learning management and integration of environmental education in school, leading to further integration environmental education through integration environmental education process. It is consisted of the following contents for teachers.

Integration is the application of environmental education with 8 academic groups which emphasized on analysis, problems solving and decisions making in the form of Webbed Model.

Environmental education with 8 academic groups is the process to provide learners with knowledge , understanding, attitude, skill, participation and ability to evaluate results to make the learners achieve learning objectives of environmental education and 8 academic groups at the same time. Teacher has very important roles in environmental education integration with all 8 academic subjects to make students achieve the objectives of environmental education and 8 academic groups effectively.

Students can apply learning results from environmental education for sustainable environmental development.

After integration environmental education with 8 academic groups, learning results of students were improved and led to sustainable development of family and community.

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4.3 Environmental Education Activities

The researcher had applied document review with planning for training teachers of basic education from 11 schools consisted of Secondary School and 8 Primary school with 32 teacher participants and 3 expert lecturers in the subjects with steps and contents as follows:

Step 1: Building knowledge and understanding on environmental education, integration with academic groups by experts in environmental education. Researcher and experts explained on objectives , principles and background of environmental education in local, nation and world level. Second , they covered all integration topics, mainly Webbed Model and third, the researcher and expert in learning management at school, School Director of Banglane Wittaya (Mr. Prasart Sangwang) helped with the lecture for teacher in 8 academic groups.

Findings showed that teachers understood contents of environmental education, teaching methods, model of environmental education and curriculum in basic education. On contents of integration, findings indicated that teachers understood well in integration and were able to explain type of integration and they could thoroughly understand all 8 academic subjects.

Step 2: Constructing guidelines for environmental education with 8 academic groups by allowing 32 teaches to determine integration methods. Teachers had agreed on the use of Webbed Model an applied with teaching plan in session 1 to achieve objectives of environmental education and 8 academic groups. The researcher divided activities for 4 groups of teachers as follows:

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Group 1 Period 1 (Prathom Suksa 1-3)

Academic Group	School	Class	Responsible Teacher
Thai Language	Ban Banglen	PrathomSuksa 2	Nualnoi Kochsila
Mathematics	Thai Rut Vittaya 4	PrathomSuksa 3	Surat Pironjiew
Sciences	Wat Veruvanaram	PrathomSuksa 2	Virut Porombiew
Social Studies	BanKlongPhraMor	PrathomSuksa 3	Udom Panjumnong
Health and Physic	Wat Sila Mool	PrathomSuksa 3	Chumpol Rattana
Art	Wat Bang Luang	PrathomSuksa 3	Umpaiporn Vainipit
Vocation	WatSookhawattanaram	PrathomSuksa 3	Voranuch Pinthong
Foreign Language	BanKlong Phramor	Prathom Suksa 3	Sangval Jaichen

Group 2 Period 2 (Prathom Suksa 4-6)

Academic Group	School	Class	Responsible Teacher
Thai Language	Wat Buo Wan	Prathom Suksa 6	Cherdsak Duangsiri
Mathematics	Wat Sila Mool	Prathom Suksa 4	Somchard Leklong
Sciences	Wat Bang Luang	Prathom Suksa 5	Soontharee Saeheng
Social Studies	Wat Sookwattanaram	Prathom Suksa 6	Preecha Yaisima
Health and Physic	Wat veruwanaram	Prathom Suksa 5	Manoop Kaokum
Art	Ban Banglen	Prathom Suksa 6	KwanjaiThongchun
Vocational	Thai Rutwittaya 4	Prathom Suksa 5	Dararat Paowasan
Foreign Language	Wat Buo Wan	Prathom Suksa 5	Supitchya Saenglee

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Group 3 Period 3 (Mattayom 1-3)

Academic Group	School	Class	Responsible Teacher
Thai Language	Buo Pak Ta	Mattayom 1	Areepun Srichum
Mathematics	Bang Luang Wittaya	Mattayom 2	Somkid Vimolchat
Sciences	Bang Luang Wittaya	Mattayom 3	Nittaya Petchsri
Social Studies	Banglen Wittaya	Mattayom 1	Vannipa Gunchot
Health and Physic	Banglen Wittaya	Mattayom 3	Paranee Sirivase
Art	Banglen Wittaya	Mattayom 1	Youthachai Pattatum
Vocational	Banglen Wittaya	Mattayom 2	Prapaporn Fugpra
Foreign Language	Banglen Wittaya	Mattayom 3	Patcharin Thongdon

Group 4 Period 4 (Mattayom 4-6)

Academic Group	School	Class	Responsible Teachers
Thai Language	Banglen Wittaya	Mattayom 4	Ungsana Preechaso
Mathematics	Buo Pak Ta Wittaya	Mattayom 5	Pathai Utoomsaku
Sciences	Banglen Wittaya	Mattayom 5	Somsak Muendow
Social Studies	Banglen Wittaya	Mattayom 6	Arsaya Suriyachai
Health Physical	Banglen Wittaya	Mattayom 5	Tawaschai Suriyac
Art	Banglen Wittaya	Mattayom 5	Sairung Praethong
Vocation	Banglen Wittaya	Mattayom 6	Tassanee Siripat
Foreign Language	Banglen Wittaya	Mattayom 4	Payung Rodpol

Four groups of teachers with 32 persons from 11 schools had joined together to write plan for integration environmental education with 8 academic groups and explain to teachers to understand the approach. Findings indicated that Webbed Model should be used as well as using step 3 to determine the practice and control. Findings indicated that one of the teacher's roles is to build environmental education with 8 academic groups through first, making the Webbed Model in 1 session, starting from May 2007 to October 2007. Second, teachers used Webbed Model to teach by

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determine own heading to link environmental education with academic groups, thus making writing more clearly.

Arranging environmental education with 8 academic groups for 11 schools has the following steps:

Thai language: teachers were responsible for teaching integration environmental Education with 8 academic groups. Findings indicated that the researcher based the process on standard learning and writing to build knowledge and find approach to solve problems and create vision for better lifestyles to love reading .Teachers were asked to use Webbed Model by determine contents on Thai language integrated with Environmental Education for Primary student, grade 2 to practice reading on environment article. Students could learn new words on environment , including current environmental problems. In writing, the researcher used writing to communicate , writing essay, short passages on environment through Webbed Model by integrating Thai language contents with environment. Students in Primary level, grade 2were asked to write poems on nature, pollution, ethics on environment to make them aware more of environment.

Mathematics : Teacher and school responsible for teaching mathematic with contents related to environment. Students were taught to understand the diversified number and application with real life situation and the use of Webbed Model to calculate quantity and percentage of forestry, and existing wildlife and concluded in graph.

Sciences: School and teaches are responsible for teaching students occupation and technology related life activities related to family and background of living creatures, effect to environment, pollution so that students can develop knowledge and awareness in environment.

Social Studies, religion and culture: School and teaches are responsible for teaching students subjects related to morals, ethics, economics, history, geography based on standard learning so tat they can behave accordingly and make themselves more useful to society and co-existed with others peacefully. Teachers would explain environmental effect from the past to the present such as cutting down trees, animal extinction and existing pollution.

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Health and Physical Education : School and teaches are responsible for teaching students to understand and see the value of life, family, sex education and having skills in daily living, health promotion , building capacity and diseases prevention. Teachers integrated environmental education with Webbed Model through exercise and putting the emphasis on environmental-friendly so that students can be aware of nature. They can maintain their own health and stop smoking to avoid air pollution.

Art: School and teaches are responsible for teaching students occupation and technology related to creative activities by asking students to draw pictures related to nature so that they can maintain good nature and cultural environment and become more aware of their own surroundings.

Vocation and technology: School and teaches are responsible for teaching students occupation and technology related to standard leaning, life activities related to family such as housework and agriculture without natural resources destruction to create future environmental problems.

Foreign language **:** School and teaches are responsible for teaching students occupation and technology related to language for communication by putting the emphasis on listening, writing in foreign languages and the use of languages for communication worldwide . Students were asked to write down words in the note books at least 10 words per day and used them to build sentences in the correct grammar.

4.4: Evaluation of Effectiveness in Environmental Education with Academic Groups for Teachers of basic education Pre-test and Post-test questionnaire had been applied

The researcher had evaluated teachers before learning about integrated Environmental Education Curriculum model with academic groups through the questionnaire to learn personal data of teacher, integration and learning management of teachers and students with Pre-test and Post-test with the following application.

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Table 57 Personnel Data of Teachers during Evaluation of effectiveness classified to gender

Gender	Number	Percentage
Males	12	37.50
Females	20	62.50
Total	32	100.00

As shown in table 57, research results revealed that there were 20 females teachers (62.50%) and 12 males teachers (37.50%) which coincided with documents revision in 2005 of Nakhon Pathom Educational Office District 2. They were total 171 schools and 3,760 teachers. The area survey showed that each teacher must teach more than one subject which made learning management in Basic Education School at Banglen district, Nakhon Pathom province ineffective.

Table 58 Personnel Data of Teachers during Evaluation of effectiveness classified to age and Religion

Age and Religion	Number	Percentage
Lower or equal to 35 years	7	21.90
36-40 years	2	6.30
41-45 years	5	15.60
46-50 years	10	31.30
More than 50 years	8	25.00
Buddhist	32	

$\overline{X}$ = 44.41 S.D. = 8.39100

As shown in table 58, research results revealed that many teachers were aged between 46-50 years old (31.30%). Next, teachers aged less or equal to 35 years (21.90% and teachers aged 41 to 45 years old (15.60%), respectively. And 32 teachers were Buddhists (100%). Findings from area research indicated that there were 37 temples in Banglen district which divided into 35 Mahaniguy Temples and 2 Thummayut Temples. Many teachers were Buddhists based on personal data.

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Table 59 Teachers Personnel Data during Evaluation of effectiveness classified by Teaching Period

Teaching Period	Number	Percentage
Period 1 (Prathom Suksa 1-3)	9	28.10
Period 2 (Prathom Suksa 4-6)	7	21.90
Period 3 (Mattayom Suksa 1-3)	8	25.00
Period 4 (Mattayom Suksa 4-6)	8	25.00

As shown in table 59, research results revealed that many teachers taught in period 1 (28.10%). Next, teachers taught in period 3 and period 4 (25.00%) and period 3 (21.90%), respectively.

Table 60 Personnel Data of Teachers during Evaluation of effectiveness classified by academic groups

Academic Groups	Number	Percentage
Thai Language	4	12.50
Mathematics	5	15.60
Sciences	3	9.40
Social Studies, Religion and Culture	5	15.60
Art	4	12.50
Health and Physical Education	2	6.30
Occupation and Technology	4	12.50
Foreign Languages	5	15.60

As shown in table 60, research results revealed that many teachers taught mathematics , social, religion and culture and foreign languages (15.60%). Next, teachers taught Thai language, art and vocational and technology (12.50%) and sciences (9.40%), respectively.

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Table 61 Effectiveness Evaluation in Teachers' Teaching Experiences

Teaching Experiences	Number	Percentage
Less than or equal 5 years	6	18.8
6-10 years	3	9.4
11-15 years	6	18.8
16-20 years	7	21.9
More than 20 years	10	31.3

As shown in table 61, research results revealed that many teachers had teaching experiences over 20 years (31.30%). Next, teachers had teaching experiences between 16-20 years (21.90%) and teachers with experiences 11-15 years or lower or equal to 5 years (18.80%), respectively.

Table 62 Personal data of teachers during evaluation of effectiveness on years of teaching services

Years of Teaching Services	Numbers	Percentage
Less than or equal	4	12.50
11-15 years	6	18.80
16-20 years	3	9.40
20-25 years	19	59.40

$\overline{X}$ = 20.22 S.D. = 8.97

As shown in table 62, research results revealed many teachers had 20-25 years of services (59.40%) . Next teachers with 11-15 years of teaching services (18.80%) and less or equal to 10 years (12.50%), respectively.

Table 63 Teachers Personal data during evaluation of effectiveness on Educational Level

Educational Level	Number	Percentage
Bachelor Degree	27	84.4
Master Degree	5	15.6

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As shown in table 63, research results revealed that many teachers graduated with Bachelor Degree (84.40%) and graduated with Master Degree(15.60%) The area survey in Banglen district, Nakhon Pathom province regarding educational level of teachers suggested that many teachers graduated with Bachelor Degree which showed that the teachers was able to manage teaching at basic education level. However, they had no research experiences to request for examination or increasing their teaching credentials.

Table 64 Teachers Personal data during evaluation of effectiveness on salary

Salary	Number	Percentage
Lower or equal 10,000 baht	3	9.4
10,001 – 20,000 baht	8	25.0
20,001 – 30,000 baht	18	56.3
30,001 – 40,000 baht	3	9.4

$\overline{X}$ = 22,573.44 S.D. = 7,281.51

As shown in table 64, research results revealed that many teachers earned salary between 20,001-30,000 baht (56.30%). Next, teachers earned salary from 10,001-20,000 baht (25.00%) and teacher with lower salary or equal to 10,000 baht and 30,001-40,000 baht , respectively.

Table 65 Teachers Personal data during evaluation of effectiveness on status

Status	Number	Percentage
Single	8	25.0
Married	21	65.6
Divorced	3	9.4

As shown in table 65, research results revealed many teachers married (65.60%), single (25.00%), and divorced (9.40%), respectively.

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Table 66 Teachers Personal data during evaluation of effectiveness classified by numbers of family members

Numbers of Family Members	Number	Percentage
1-2 persons	5	15.6
3-4 persons	19	59.4
More than 4 persons	8	25.0

$\overline{X}$ = 3.84 S.D. = 1.25

As shown in table 66, research results revealed many teachers had 3-4 family members (59.40%). Next, teachers had family members more than 4 persons (25.00%). Teachers with 1- 2family members(15,69%), respectively. And 32 teachers lived at Banglen District. From the area survey of Banglen district, Nakhon Pathom province, it was found that 11 schools consisted of 3 secondary schools and 8 primary schools were selected for this research.

Table 67 Comparison of Teacher Learning Results classified by period 2, Pre-test and Post-test on Integrated Environmental Education Curriculum Model with Academic Groups

Period	Area	Pre-test (n=32)		Post-test (n=32)	
		Mean	S.D.	Mean	S.D.
Period 1	Cognitive	3.43	0.52	4.50	0.28
	Affective	3.51	0.52	4.60	0.36
	Psychomotor	3.48	0.38	4.61	.044
	Overall	3.47	0.45	4.57	0.33

As shown in table 67, research results revealed that comparison of Teacher Learning Results classified by period 1, Pre-test on Integrated Environmental Education Curriculum with Academic Groups in Cognitive Domain (Mean 3.43%), Affective Domain (Mean 3.51%) and Skill Domain (Mean 3.48%). For Post-test on Integrated Environmental Education Curriculum with Academic Groups in Cognitive Domain (Mean 4.50%), Affective Domain (Mean 4.60%) and Skill Domain (Mean

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4.61%). Overall results, Pre-test showed Mean of 3.47% and Post-test Mean of 5.57%.

Table 68 Comparison of Teacher Learning Results classified by period 2, Pre-test and Post-test on Integrated Environmental Education Curriculum Model with Academic Groups

Period	Area	Pre-test (n=32)		Post-test (n=32)	
		Mean	S.D.	Mean	S.D.
Period 2	Cognitive	3.43	0.84	4.46	0.21
	Affective	3.40	0.99	4.30	0.20
	Psychomotor	3.43	0.98	4.42	0.42
	Overall	3.42	0.88	4.39	0.18

As shown in table 68, research results revealed that comparison of Teacher Learning Results classified by period 2, Pre-test and Post-test on Integrated Environmental Education Curriculum Model with Academic Groups in Cognitive Domain (Mean 3.43%), Affective Domain (Mean 3.40%) and Skill Domain (Mean 3.43%). For Post-test on Integrated Environmental Education Curriculum with Academic Groups in Cognitive Domain (Mean 4.46%), Affective Domain (Mean 4.30%) and Skill Domain (Mean 4.42%). Overall results, Pre-test showed Mean of 3.42% and Post-test Mean of 4.39%.

Table 69 Comparison of Teacher Learning Results per period 3, Pre-test and Post-test on Integrated Environmental Education Curriculum Model with Academic Groups

Period	Areas	Pre-test (n=32)		Post-test (n=32)	
		Mean	S.D.	Mean	S.D.
Period 3	Cognitive	3.35	0.52	4.63	0.15
	Affective	3.50	0.85	4.70	0.28
	Psychomotor	3.63	0.38	4.42	0.43
	Overall	3.49	0.56	4.58	0.21

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As shown in table69, research results revealed that comparison of Teacher Learning Results per period 3, Pre-test and Post-test on Integrated Environmental Education Curriculum Model with Academic Groups Cognitive Domain (Mean 3.35%), Affective Domain (Mean 3.50%) and Skill Domain (Mean 3.63%). For Post-test on Integrated Environmental Education Curriculum with Academic Groups in Cognitive Domain (Mean 4.63%), Affective Domain (Mean 4.70%) and Skill Domain (Mean 4.42%). Overall results, Pre-test showed Mean of 3.49% and Post-test Mean of 4.58%.

Table 70 Comparison of Teacher Learning Results classified per period 4, Pre-test and Post-test on Integrated Environmental Education Curriculum Model with Academic Groups

Period	Area	Pre-test (n=32)		Post-test (n=32)	
		Mean	S.D.	Mean	S.D.
Period 4	Cognitive	3.85	0.70	4.46	0.51
	Affective	4.10	0.89	4.30	0.64
	Psychomotor	4.04	0.77	4.50	0.56
	Overall	4.00	0.76	4.42	0.56

As shown in table 70, research results revealed that comparison of Teacher Learning Results classified per period 4, Pre-test and Post-test on Integrated Environmental Education Curriculum Model with Academic Groups with Cognitive Domain (Mean 3.85%), Affective Domain (Mean 4.10%) and Skill Domain (Mean 4.04%). For Post-test on Integrated Environmental Education Curriculum with Academic Groups in Cognitive Domain (Mean 4.46%), Affective Domain (Mean 4.30%) and Skill Domain (Mean 4.50%). Overall results, Pre-test showed Mean of 4.00% and Post-test Mean of 4.42%.

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Table 71 Comparison of Teacher Learning Results per academic groups, Pre-test and Post-test on Integrated Environmental Education Curriculum Model with Academic Groups

Area	Pre-test (n=32)		Post-test(n=32)		t-test	Sig.
	Mean	S.D.	Mean	S.D.		
1. Cognitive Domain	3.52	0.65	4.49	0.33	-7.548*	0.000
2. Affective Domain	3.63	0.82	4.50	0.44	-5.277*	0.000
3. Psychomotor Domain	3.65	0.67	4.47	0.46	-5.739*	0.000
Overall	3.60	0.68	4.49	0.37	-6.535*	0.000

As shown in table 71, research results revealed that overall comparison of Teacher Learning Results per academic groups, Pre-test and Post-test on Integrated Environmental in Cognitive Domain, Affective Domain, and Skill Domain were in very good standard (4.49%). Teachers show learning results of academic groups with statistical significant different < 0.05.

Table 72 Comparison of Teacher Learning Results in Environmental Educational per period 1, Pre-test and Post-test on Integrated Environmental Education Curriculum Model with Academic Groups

Period	Area	Pre-test(n=32)		Post-test(n=32)	
		Mean	S.D.	Mean	S.D.
Period 1	1. Awareness	4.41	0.43	4.83	0.28
	2. Knowledge	3.89	0.60	4.39	0.39
	3. Attitude	4.15	0.78	4.67	0.52
	4. Skill	3.38	0.67	4.67	0.52
	5. Participation	3.56	0.83	4.44	0.50
	6. Ability in evaluation of results	4.41	0.62	4.72	0.44
	Overall	3.98	0.49	4.62	0.36

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As shown in table 72, research results revealed that teacher learning results in Environmental Educational per period 1, Pre-test in awareness, knowledge, attitude, participation and ability to evaluate. Overall teacher leaning results showed good standard (3.98%) and Post-test in very good standard(Mean 4.62%).

Table 73 Comparison of Teacher Learning Results in Environmental Educational per period 2, Pre-test and Post-test on Integrated Environmental Education Curriculum Model with Academic Groups

Period	Area	Pre-test(n=32)		Post-test(n=32)	
		Mean	S.D.	Mean	S.D.
Period 2	1. Awareness	4.57	0.79	5.00	0.00
	2. Knowledge	4.33	0.75	4.58	0.50
	3. Attitude	4.38	0.76	4.75	0.50
	4. Skill	3.10	0.94	4.67	0.27
	5. Participation	3.33	1.05	4.83	0.19
	6. Ability in evaluation of results	4.14	1.21	4.92	0.17
	Overall	3.98	0.79	4.79	0.18

As shown in table 73, research results revealed that teacher learning results in Environmental Educational per period 2, Pre-test in awareness (Mean 4.57%), knowledge (Mean 4.33%) , attitude (Mean 4.38%), skill (Mean 3.10%), participation (Mean 3.33%) and ability to evaluate (Mean 4.14%) . Overall teacher leaning results showed good standard (Mean 3.98%) and overall Post-test in those areas was in very good standard(Mean 4.79%). This finding coincided with interview statement of Banglane Wittaya Director, Mr. Prasart Saengsawang who realized that teaching students only environmental education in sciences may not be enough. Students must learn aspects of Environmental Education different from environmental subject so that they can understand the subject in-depth.

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Table 74 Comparison of Teacher Learning Results in Environmental Educational per period 3, Pre-test and Post-test on Integrated Environmental Education Curriculum Model with Academic Groups

Period	Area	Pre-test(n=32)		Post-test(n=32)	
		Mean	S.D.	Mean	S.D.
Period 3	1. Awareness	4.71	0.38	4.71	0.42
	2. Knowledge	4.08	0.81	4.67	0.44
	3. Attitude	4.54	0.50	4.71	0.45
	4. Skill	3.25	0.83	4.71	0.42
	5.Participation	3.75	0.92	4.75	0.44
	6. Ability in evaluation of results	4.21	1.14	4.63	0.45
	Overall	4.09	0.70	4.69	0.24

As shown in table 74, research results showed teacher learning results in Environmental Educational per period 3, Pre-test in awareness , knowledge, attitude, skill participation , and ability to evaluate. Overall teacher leaning results showed good standard (Mean 4.09%) and Post-test in those areas was in very good standard(Mean 4.69%).

Table 75 Comparison of Teacher Learning Results in Environmental Educational per period 4, Pre-test and Post-test on Integrated Environmental Education Curriculum Model with Academic Groups

Period	Area	Pre-test(n=32)		Post-test(n=32)	
		Mean	S.D.	Mean	S.D.
Period 4	1. Awareness	4.67	0.44	4.67	0.47
	2. Knowledge	4.42	0.61	4.50	0.47
	3. Attitude	4.67	0.47	4.63	0.52
	4. Skill	3.83	0.64	4.21	0.56
	5. Participation	3.63	0.52	4.17	0.56
	6. Ability in evaluation of results	4.67	0.47	4.54	0.73
	Overall	4.31	0.40	4.45	0.43

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As shown in table 75, research results showed teacher learning results in Environmental Educational per period 4, Pre-test in awareness , knowledge, attitude, skill participation , and ability to evaluate. Overall teacher leaning results showed good standard (Mean 4.31%) and Post-test in those areas was in very good standard(Mean 4.45%).

Table 76 Comparison of Teacher Learning Results in Environmental Educational , Pre-test and Post-test on Integrated Environmental Education Curriculum Model with Academic Groups

Area	Pre-test(n=32)		Post-test(n=32)		t-test	Sig.
	Mean	S.D.	Mean	S.D.		
1. Awareness	4.58	0.51	4.80	0.35	-2.010*	0.049
2. Knowledge	4.17	0.69	4.57	0.42	-2.842*	0.006
3.Attitude	4.43	0.65	4.71	0.45	-2.015*	0.048
4. Skill	3.43	0.78	4.50	0.52	-6.457*	0.000
5. Participation	3.57	0.82	4.48	0.51	-5.328*	0.000
6. Ability in evaluation of results	4.36	0.88	4.68	0.50	-1.753*	0.085
Overall	4.09	0.59	4.62	0.33	-4.483*	0.000

As shown in table 76, research results showed Pre-test on Integrated Environmental Education Curriculum Model with Academic Groups in awareness , knowledge, attitude, skill participation , and ability to evaluate. Overall teacher leaning results showed good standard (Mean 4.09%) and Post-test in those areas was in very good standard(Mean 4.62%) which yielded statistical significance differences < 0.05 in all areas except evaluation results with statistical significance differences < 0.05.

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Comparison of Teacher Learning Results in Environmental Educational , Pre-test and Post-test on Integrated Environmental Education Curriculum Model with Academic Groups

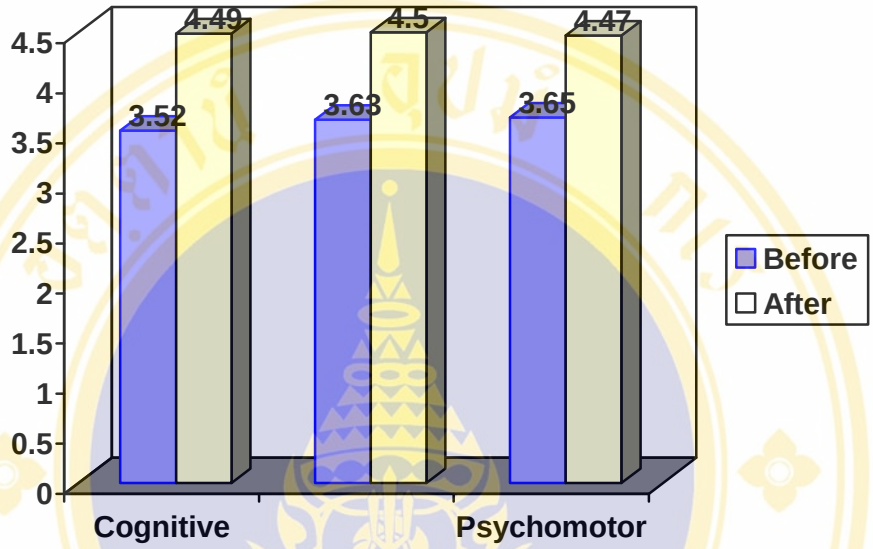

Figure 6 Comparison of Teachers learning results related to Academic Groups

Research results indicated comparison of Teachers learning results in Pre-test Integrated Environmental Education Curriculum Model with academic groups Cognitive Domain (Mean 3.52%), Affective Domain (Mean 3.63%) and Skill Domain (Mean 3.65%). For Post-test on Integrated Environmental Education Curriculum with Academic Groups in Cognitive Domain (Mean 4.49%), Affective Domain (Mean 4.50%) and Skill Domain (Mean 4.47%).

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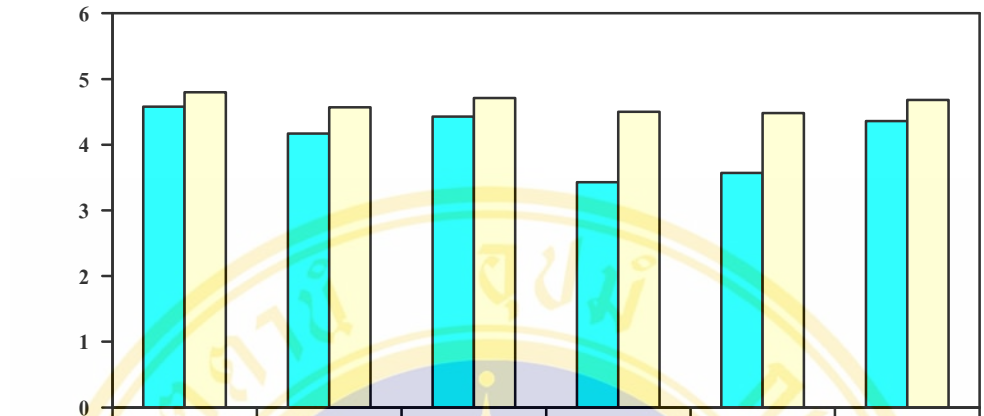

	Awareness	Knowledge	Attitude	Skill	Participation	Evaluation
Before	4.58	4.17	4.43	3.43	3.57	4.36
After	4.8	4.57	4.71	4.5	4.48	4.68

Figure 7 Comparison of Teachers learning results related to Environmental Learning

Comparison of Teachers learning results showed Environmental Learning, Pre-test on Integrated Environmental Education Curriculum Model with academic groups in awareness 4.58, knowledge 4.17, attitude 4.43, skill 3.43 and participation 3.57.

Post-test showed awareness 4.80, knowledge 4.57, attitude 4.71, skill 4.50 and participation 4.48, and ability to evaluate results 4.68.

To summarize, overall results comparison of learning results related to Environmental Learning, Pre-test showed Mean 4.09 and Post-test showed Mean 0.05

Table 77 Personal Data of students classified by gender

Gender	Number	Percentage
Males	313	43.59
Females	405	56.41
Total	718	100.00

As shown in table 77, research results revealed that 405 students (56.41%) were females and 313 males (43.59%).

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Table 78 Personal Data of students classified to age

Age	Number	Percentage
Lower or equal 10 years	192	26.74
11-12 years	142	19.78
13-14 years	137	19.08
15-16 years	168	23.40
more than 16 years	79	11.00

$\overline{X}$ = 12.71 S.D. = 2.96

As shown in table 78, research results revealed that many students were younger or equal to 10 years of age (26.74%), next students 15-16 years old (23.40%) and students 11-12 years old (19.78%), respectively.

Table 79 Personal Data of students classify by religion

Religion	Number	Percentage
Buddhist	711	99.03
Christian	6	.84
Islam	1	.14

As shown in table 79, research results revealed that 711 students were Buddhists (99.03%), followed by 6 Christians (0.84%) and 1 Islam (0.14%), respectively.

Table 80 Students Individual Data classified by family members

Family Members	Number	Percentage
Lower or equal 3 persons	110	15.32
4 – 5 persons	430	59.89
More than 5 persons	178	24.79

$\overline{X}$ = 4.96 S.D. = 1.93

As shown in table 80, research results revealed that many students were in families with 4-5 members (59.89%), followed by 178 students with more than 5

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family members (24.79%) and 110 students with 3 family members or less (15.32%), respectively. And many students lived in Banglen district, Nakhon Pathom province (100%) which coincided with documents and area survey of Nakhon Pathom Educational Office, District 2. Total 12,097 students attended schools at Banglen district (Nakhon Pathom Educational Office , Policies and Planning, District 2, 2005).

Table 81 Personal Data of students classified by Class Period

Class Period	Number	Percentage
Period 1 (Pratom Suksa 1-3)	140	19.50
Period 2 (Pratom Suksa 4-6)	158	22.01
Period 3 (Mattayom Suksa 1-3)	197	27.44
Period 4 (Mattayom Suksa 4-6)	223	31.06

As shown in table 81, research results revealed that 223 students were mostly in period 4 (Mattayom Suksa 4-6) (31.06%). Next, 197 students in period 3 (Mattayom Suksa 1-3) (27.44%) and 158 students in period 2 (22.01%), respectively.

Table 82 Comparison of Students learning results classified by Period 1, Pre-test and Post-test on Integrated Environmental Education Model with academic groups

Period	Area	Pre-test (n=718)		Pro-test (n=718)	
		Average	S.D.	Average	S.D.
Period 1	Cognitive	3.45	0.65	4.25	0.54
	Affective	3.75	0.71	4.40	0.48
	Skill	3.68	0.73	4.30	0.57
	Overall	3.63	0.65	4.32	0.47

As shown in table 82, overall research results revealed students in period 1 had good pre-learning results in Cognitive domain, Affective Domain and Skill Domain (Mean 3.63%) and overall post-learning results were excellent (Mean 4.32%).

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Table 83 Comparison of Students learning results per period 2, Pre-test and Post-test Integrated Environmental Education Model with Academic groups

Period	Area	Pre-test (n=718)		Pro-test (n=718)	
		Mean	S.D.	Mean	S.D.
Period 2	Cognitive	3.03	0.69	4.05	0.67
	Affective	3.45	0.83	4.18	0.57
	Skill	3.20	0.86	4.16	0.68
	Overall	3.23	0.75	4.13	0.60

As shown in table 83, research findings revealed that students in period 2 had good overall results of Pre-test in Integrated Environmental Education in Cognitive Domain, Affective Domain and Skills Domain (average 3.23%) and Post-test showed good results (4.13%).

Table 84 Comparison of Students learning results in Period 3, Pre and post Integrated Environmental Education Model with Academic groups

Period	Area	Pre-test (n=718)		Pro-test (n=718)	
		Mean	S.D.	Mean	S.D.
Period 3	Cognitive	3.17	0.48	4.04	0.72
	Affective	3.53	0.57	4.20	0.59
	Skill	3.41	0.64	4.16	0.68
	Overall	3.37	0.50	4.13	0.62

As shown in table 84, research findings revealed that students in period 3 had good overall results of Pre-test in Integrated Environmental Education in Cognitive Domain, Affective Domain and Skills Domain (average 3.37%) and Post-test showed good results (4.13%).

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Table 85 Comparison of Students learning results in Period 4, Pre and post Integrated Environmental Education Model with Academic groups

Period	Area	Pre-test (n=718)		Pro-test (n=718)	
		Mean	S.D.	Mean	S.D.
Period 4	Cognitive	3.22	0.46	4.28	0.67
	Affective	3.59	0.52	4.36	0.53
	Skill	3.41	0.56	4.34	0.65
	Overall	3.41	0.45	4.32	0.57

As shown in table 85, research findings revealed that students in period 4 had good overall results of Pre-test in Integrated Environmental Education in Cognitive Domain, Affective Domain and Skills Domain (average 3.41%) and Post-test showed very good results (4.32%).

Table 86 Comparison of Students learning results, Pre and post Integrated Environmental Education Model with Academic groups

Area	Pre-test (n=718)		Post-test(n=718)		t-test	Sig.
	Mean	S.D.	Mean	S.D.		
Cognitive	3.21	0.58	4.16	0.67	-28.642*	0.000
Affective	3.57	0.66	4.28	0.55	-22.069*	0.000
Skill	3.42	0.70	4.24	0.65	-22.990*	0.000
Overall	3.40	0.59	4.23	0.58	-26.698*	0.000

As shown in table 86, research findings revealed that learning comparison among students in Academic Domain of Pre-test in Integrated Environmental Education in Cognitive Domain, Affective Domain and Skills Domain showed good results (average 3.40%) and Post-test in very good results (4.32%), having statistical significant differences at 0.05.

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Table 87 Comparison of Students learning results classified by Level 1, Pre and post Integrated Environmental Education Model with Academic groups

Period	Area	Pre-test(n=718)		Post-test(n=718)	
		Mean	S.D.	Mean	S.D.
Period 1	1. Awareness	4.44	0.63	4.61	0.49
	2. Knowledge	3.94	0.75	4.46	0.47
	3. Attitude	4.21	0.66	4.65	0.40
	4. Skill	3.81	0.85	4.44	0.53
	5. Participation	3.75	0.93	4.51	0.49
	6. Ability to evaluate results	4.36	0.81	4.68	0.50
	Overall	4.09	0.57	4.56	0.38

As shown in table 87, research findings revealed that learning comparison among students in Academic Domain of Pre-test in Integrated Environmental Education in awareness, knowledge, attitude, skill, participation and ability in evaluation results showed good results (Mean 4.09%) and Post-test in very good results (4.32%), having statistical significant differences at 0.05.Overall results indicated that students had very good standard (Mean 4.56%).

Table 88 Comparison of Students learning results per Period 2, Pre and post Integrated Environmental Education Model with Academic groups

Period	Area	Pre-test(n=718)		Post-test(n=718)	
		Mean	S.D.	Mean	S.D.
Period 2	1. Awareness	4.03	0.80	4.57	0.54
	2.Knowledge	3.75	0.79	4.34	0.59
	3. Attitude	3.74	0.82	4.35	0.62
	4. Skill	3.47	0.83	4.15	0.65
	5. Participation	3.58	0.90	4.24	0.72
	6. Ability to evaluate results	4.15	0.78	4.59	0.56
	Overall	3.79	0.67	4.37	0.49

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As shown in table 88, research results showed students learning results per Period 2, Pre-test in Integrated Environmental Education model with academic groups in awareness, knowledge, attitude, skill, participation and ability in evaluation results. Overall results showed good standard (Mean 3.79%) and Post-test in those areas showed very good results (4.37%).

Table 89 Comparison of Students Learning Results Per Period 3, Pre and Post Integrated Environmental Education Model with Academic Groups

Period	Area	Pre-test(n=718)		Post-test(n=718)	
		Mean	S.D.	Mean	S.D.
Period 3	1. Awareness	4.03	0.76	4.57	0.53
	2. Knowledge	3.66	0.68	4.33	0.60
	3. Attitude	3.64	0.82	4.36	0.65
	4. Skill	3.42	0.69	4.16	0.71
	5. Participation	3.45	0.72	4.24	0.73
	6. Ability to evaluate results	4.06	0.85	4.59	0.58
	Overall	3.71	0.58	4.37	0.51

As shown in table 89, research results showed students learning results per period 3, pre- test on integrated environmental education model with academic groups in awareness, knowledge, attitude, skill, participation and ability in evaluation results. overall results showed good standard (Mean 3.71%) and post-test in those areas showed very good results (4.37%).

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Table 90 Comparison of Students Learning Results Per Period 4, Pre-test and Post-test on Integrated Environmental Education Model with Academic Groups

Period	Area	Pre-test(n=718)		Post-test(n=718)	
		Mean	S.D.	Mean	S.D.
Period 4	1. Awareness	4.28	0.64	4.73	0.41
	2. Knowledge	3.80	0.57	4.47	0.49
	3. Attitude	4.07	0.65	4.58	0.51
	4. Skill	3.59	0.59	4.41	0.57
	5. Participation	3.52	0.67	4.41	0.62
	6. Ability to evaluate results	4.35	0.66	4.71	0.46
	Overall	3.93	0.45	4.55	0.38

As shown in table 90, research results showed students learning results per Period 4, Pre- test on Integrated Environmental Education Model with Academic groups in awareness, knowledge, attitude, skill, participation and ability in evaluation results. Overall results showed good standard (Mean 3.93-%) and Post-test in those areas showed very good results (4.55%).

Table 91 Comparison of Students learning results, Pre-test and post – test on Integrated Environmental Education Model with Academic groups

Area	Pre-test(n=718)		Post-test(n=718)		t	Sig.
	Mean	S.D.	Mean	S.D.		
1Awareness	4.19	0.72	4.63	0.50	13.445*	0.000
2. Knowledge	3.78	0.70	4.40	0.55	18.894*	0.000
3.Attitude	3.91	0.77	4.48	0.57	15.938*	0.000
4. Skills	3.56	0.74	4.29	0.63	20.110*	0.000
5. Participation	3.56	0.80	4.35	0.66	20.308*	0.000
6. Ability to evaluate	4.23	0.78	4.65	0.52	11.992*	0.000
Overall	3.87	0.58	4.47	0.45	21.659*	0.000

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Table 91 revealed good standard in Pre-test results on environmental education learning with 8 academic groups in awareness, knowledge, attitude, skill, participation and ability to evaluate (Mean 3.87) and Post-test in those areas showed very good results (4.47%), having statistical significant differences < 0.05.

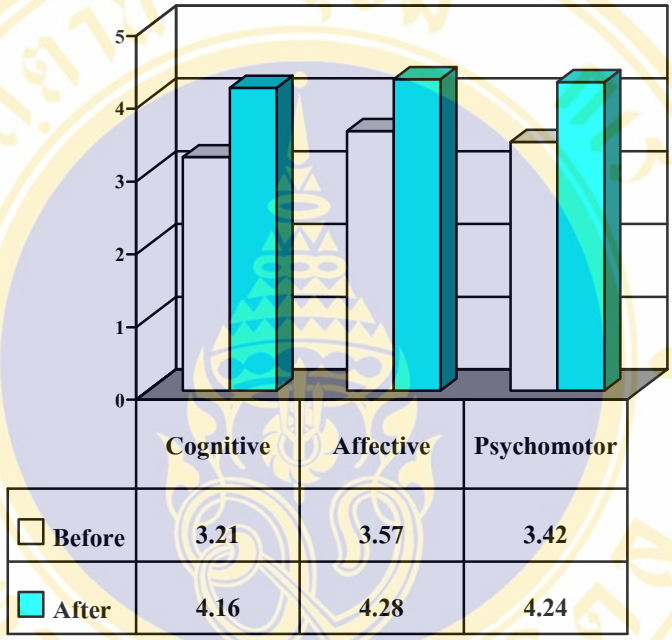

Figure 8 Comparison of Mean in Students learning results as related to Academic groups

To summarize, comparison of students learning results related to Environmental Education, Pre-test with 8 academic groups showed Cognitive Domain with Mean 3.21% Affective Domain with Mean 3.57% and Skill Domain with Mean 3.42% Comparison of Students learning results related to academic groups, Post-test showed Cognitive Domain with Mean 4.16%, Affective Domain with Mean 4.29 and Skill Domain with Mean 4.14.

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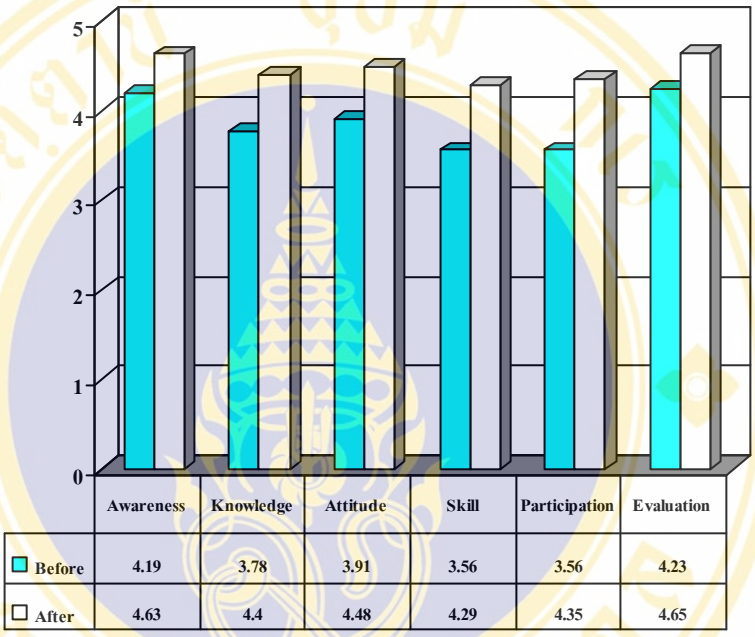
Students had overall learning results related to Environmental Education, Pre-test with 8 academic groups showed the Mean 3.40, and Pre-test with 8 academic groups showed the Mean 3.40, Affective Domain with Mean 3.57 and overall learning results in Post-test with Mean 4.23. Students learning results showed statistical significant differences at 0.05.



	Awareness	Knowledge	Attitude	Skill	Participation	Evaluation
Before	4.19	3.78	3.91	3.56	3.56	4.23
After	4.63	4.4	4.48	4.29	4.35	4.65

Figure 9 Comparison of Students learning results related to Environmental Education

Comparison of Students learning results related academic groups , Pre-test and Post-test in Cognitive Domain academic groups showed overall results of Mean 3.87 and 4.47 with statistical significant differences at 0.05%.

Comparison of Students learning results related to Environmental Education, Pre-test with 8 academic groups showed Environmental Education results in awareness of 4.19, knowledge 3.78, attitude 3.91, skill 3.56, participation 3.56 and ability to evaluate results 4.23%

Comparison of Students learning results related to Environmental Education, Post-test with 8 academic groups showed Environmental Education results in awareness of 4.63, knowledge 4.40, attitude 4.48, skill 4.29, participation 4.35 and ability to evaluate results 4.65%.

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CHAPTER V
DISCUSSION

The research objectives on integration of Environmental education for Teachers of Basic Education in Schools were to design and evaluate a model for academic groups for basic education teachers in 4 steps as follows: the first was involved with Environmental Education in School and Community, and integration of learning management and student's learning in Environmental Education. The second was to build a model for academic groups. The third was to arrange Environmental Education activities for basic education teachers and the final step was to evaluate the effectiveness of the model in Environmental Education activities for teachers with academic groups. The results are explained as follows:

5.1 Current Environmental Education Situation

5.1.1 The objective of environmental educational in school and community was to construct and evaluate the effectiveness of integration of environmental education with academic groups for basic education teachers. The findings indicated that arranging Environmental Education for teachers in basic education schools involved the following steps: 1. Building knowledge and understanding about environmental education, integration and academic groups from observing behavior while participating in activities, and building teachers' attention during training, discussion, and teachers' learning. Findings indicated that teachers had clear understanding about environmental education in contents, definitions, principles, objectives and model of environmental education. These findings coincided with the research results of Pinda Varasumnan (2004) in the development of a cause based model in ability to manage Integration Environmental Education Learning among Primary School teachers. It was found that teachers' ability to learn about

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Environmental Education depended on curriculum, organization and the teacher. For integration of contents, findings from observation in behavior and interest of teachers indicated that teachers had good knowledge and understood integration quite well. Evaluation of effectiveness in Integration Environmental Education model showed very good overall results comparison of teachers in affective domain, cognitive domain and psychomotor domain at (Mean 4.49) which coincided with the set objectives to construct and evaluate effectiveness of integration environmental education with academic groups effectively.

5.1.2 Environmental education in schools and the community in Nakhon pathom district 2 was conducted in 4 districts: Sampran, Nakhon Chaisri, Phuttamonthon and Banglen. Findings indicated that district offices in the area were responsible for the total of 144 schools with 2,484 students with a total 55,654 students. Participants' data consisted of personal data of teachers and students. Findings from research results indicated that participants were 142 teachers (35.50%) and 258 students (64.50%).

Findings from the study of primary data to analyze the environmental situation in the school and community revealed that type of sample soils were mostly loose soils mixed with clay (60.25%) which coincided with the area survey and the interview with an expert in agricultural management in Banglen District (Mr. Somkiet Soonthornumpai). People are rice farmers mainly because the soils in the area are loose soils mixed with clay which are quite suitable for growing rice because of the soil's ability to retain water in the lands used in agriculture. The soil toxicity problem is chemical residue in the soils. For community environment, findings indicated most water supplies came from underground and were used in agriculture. Pollution problems in water sources came from garbage. On air pollution in schools and communities, the majority of participants saw problems in the dust which coincided with the research results of projects to develop schools and communities through integrated environmental education, 2001. Findings indicated that the majority of participants in the areas were farmers and environmental problems in most areas came

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from garbage and source of air pollution from automobiles. Participants agreed that energy used most in schools and communities was electricity and there were problems from the high cost of energy. The popular economic crop was rice and the most grown garden vegetable was chili. Chickens were raised in the community as economic animals and for household consumption.

5.1.3 Environmental problems in schools and communities clearly affected the health of students and communities . There were problems with garbage being scattered all over the place and creating aesthetic pollution disturbing the surrounding area which coincided with the research results of project to develop school and community through Integrated Environmental Education, 2001.

Banglen district area is a flat plain. This affects the lifestyles of many villagers. Many villages and schools were unable to grow many perennial trees because of flood waters. During heavy rainfall, water cannot drain out quickly and certain environmental conditions, such as dust from trucks carrying sands and soils, affected communities. Some areas at Banglen district dug sands from the ground. Even though there has not been the pollution impact, it is difficult to travel. The other obvious environmental problem is garbage scattered everywhere. Therefore, it is extremely urgent for everyone in the local community to protect the environment so that the garbage problem can be eradicated.

5.1.4 Findings from learning results among students in 8 academic groups indicated that Integration Environmental Education

Findings from students' learning results indicated that most encountered problems in integration of learning management among students of 8 academic groups in Nakhonpathom Educational Office District 2 were lacking teaching media at school which coincided with research education unit (Ministry of Education, 2003) in the application of teaching media in accordance with Basic Education in pilot schools and net work schools. It was found that the schools had an insufficient amount of teaching media to meet the demand. Besides, the available media were obsolete and learning

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sources inadequate which coincided with problems in students' demand for more modern teaching media with enough computers and materials for students.

Regarding budget allocation for purchasing media based on the need and teachers' development, findings indicated that executives, teachers, students and community used more media in post-application of basic curriculum than pre-application. They were highly satisfied with the application of teaching media. Because of lacking budget in making and purchasing learning materials, a certain number of schools still lacked teaching media both in documents and technology. Moreover, personnel were inexperienced and lacked understanding in the application of learning media (Department of Curriculum and Instruction Development, 2003:44).

It was an opportunity for teachers to integrate properly with learners, academic learning, and learning results to coincide with own skill and having assistances in Information system, materials and equipments for teaching. It also provided support from relevant parties with consideration first on the learner's benefits (Ministry of Education, 2004:7). In the integration Environmental Education management, findings indicated that 65.50% had arranged Integration Environmental Education at school.

The finding coincided with the National Development Plan 9th Edition (2545-2549 B.E.) which emphasized developing learner's potential with creativity and ability to analyze, problem-solving, ethics, self-support and ability to link knowledge and good value for daily living through the Basic Education Curriculum, 2549 B.E (2002 A.D). It is the mechanism to develop the learner's potential to be righteous person and arrange teaching based on authentic situations, self-learning, shared knowledge, learning from nature and real practice and integration learning (Ministry of Education, 2002:21). For students' learning results in other academic groups, findings indicated that overall the Mean was at a good level (3.53) and learning results of students in Environmental Education was at a good level.

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5.2 Constructing Integrated Environmental Education with Academic Groups

Research findings indicated that integration environmental education with academic groups for the teachers in basic education schools model was constructed properly because the Integrated Environmental Education had contents of 7 academic groups as follows: Chapter 1, the introduction, mentioned objectives of construction and evaluation of effectiveness in integration of environmental education model with academic groups. Chapter 2 consisted of data of teachers and students and environmental data of the school and community as well as data on integration of environmental education, learning results of students in academic groups and environmental education, problems, obstacles and recommendations. Chapter 3 consisted of integration of learning management in the meaning and type of Integration Environmental Education, model of integration of teaching management, integration of Webbed Model and benefits of integration of learning management. Chapter 4 on Environmental Education consisted of contents, Environmental Education principles, and objectives of Environmental Education. Chapter 5 consisted of content, environmental, culture, and association between natural and cultural environment. Chapter 6 consisted of 8 academic groups in basic curriculum contents. Chapter 7 summarized the contents of environmental education with all academic groups with the most suitable approach, the webbed model. This finding coincided with research results of Siripatch Jedsadaviroj (2003) who used the integration webbed model because of its ability to link the topic with other related subjects by allowing the students to learn and it considered contents to link with related topics and classified sub topics to relate with teaching contents.

5.3 The activities of Environmental Education

5.3.1 Arranging environmental education for teacher basic education is to provide knowledge in integration, environmental education and academic groups. The findings indicated that teachers had good understanding of contents, definitions, principles, objectives, teaching methods, and the model for developing the

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Environmental Education curriculum as well as having good knowledge and understanding in integration and being able to explain the nature of integration. Regarding contents in integration, findings indicated that teachers had good understanding in contents of all 8 academic groups by considering the contents and teacher's learning before integration of environmental education into academic groups based on the objectives of environmental education which coincided with the nation development plan 9th edition (2545B.E-2549 B.E) which is increasing the potential for teachers and students to solve problems and exist in society happily (Office of the Basic Education Committee, 2004: 2). This finding coincided with the research results of Pinda Varasunan in the development of cause-based model in Integration of environmental education among primary school teachers (2004, abstract). Results analysis on teacher's opinion on teaching factors in environmental education of primary school teacher classified by school region, with a statistical significance of 0.05 showed that teaching Integration of environmental education, teacher's ability and characteristics of teachers were influencing factors towards curriculum management and primary school teachers' ability to manage environmental education and these findings coincided with evidence-based data.

5.4 Evaluation of Effectiveness of Integration of Environmental Education with 8 Academic Groups for Teachers in Basic Education Schools in Real Situations

5.4.1 Learning results of teachers in integration environmental education with 8 academic groups increased in the cognitive domain, affective domain and psychomotor domain by the achievement of significantly different learning results with a statistical significance at <0.05. Findings after classification in class level 1 to level 4 indicated that teacher learning results increased in all levels after environmental education training, integration and academic groups training. Overall results comparison in environmental education between Pre and Post integration with academic groups showed the increase from good to very god. After comparison in all 4 levels, learning results showed increases in all levels also. This coincided with

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Bruner's learning theory of constructionism which states that learning should happen when learners participate in the construction of object value which is of interest to them. This was based on their beliefs that learning happened when learners associated with their environment to solve problems (The Secretariat of Education, Ministry of Education, 2004:104)

Evaluation of effectiveness in integration education (Office of Curriculum and Standard Education, Office of the Basic Education Commission, Ministry of education, 2004. 66-69). Learner's ability should not be judged by learning achievement after the completion of learning, but rather on learning process. Therefore, assessment of results should be authentic assessment from performance or activities. Therefore, assessment in integration of learning results should cover learning or academic groups because integration of environmental education based on the concept of involvement in holistic or skills in real life helps to create and modify learning for maximum quality.

5.4.2 Findings from pre-learning and post-learning of integration of environmental education among students indicated that overall differences showed statistical significant differences at 0.05 in affective domain, cognitive domain and psychomotor domain. After the comparison classification from class level 1 to 4, the overall picture showed increases in mean of affective domain, cognitive domain and psychomotor domain. For comparison of pre and post integration environmental education with academic groups in 6 areas of awareness, knowledge, attitude, skill, participation and ability to evaluate results, overall results showed statistical significance differences (< 0.05). Comparison in environmental education learning of students at class level 1 to 4 also show the increase in learning at all levels.

5.4.3 For Integration of environmental education management for teachers in schools, findings indicated that Integration of environmental education was included in sciences and social studies and developed personality mostly. Environment contents is included in certain subject only without categorizing subjects or arranging specific teacher to teach environmental education which coincided with the research work of officials on efficiency promotion, (Ministry of Education, 2002).

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Findings from the research of Pinda Varasunan (2001) revealed that integration in environmental education management of primary School teachers in Thailand showed Thai primary school teachers' capability in managing at a high level which indicated many teachers follow guidelines of environmental education. This finding confirmed that environmental education in Thailand has a firm structure. Findings from the results comparison in teachers' opinion indicated that factors effecting teachers' ability to manage teaching consisted of curriculum, organization and teacher. For teachers' management in academic groups, findings indicated that in Nakhonpathom district 2 many schools lacked teachers with specific knowledge in mathematics, sciences and foreign languages which coincided with the research study of research division, Department of Curriculum and Instruction Development, Ministry of Education, 2546 B.E (2003 A.D). A teacher must carry a heavy work load from teaching many subjects. Even with extra school teachers and community help, it still was not enough. Therefore, the government should make the number of teachers match with the number of students in each school

.

In conclusion, the objective of the research study for teachers in basic education was to construct and evaluate its effectiveness with academic groups. After results evaluation in 3 areas of cognitive domain, affective domain and psychomotor domain showed statistical significance at 0.05%. Results of environmental education suggested that teachers had increased knowledge, understanding and were able to achieve environmental education in 6 areas of awareness, knowledge, attitude, skill, and participation and evaluation ability.. Student learning in academic groups showed increased knowledge after the application of integration environmental education in cognitive domain, affective domain and psychomotor domain with statistical significance of < 0.05. Findings from environmental education learning showed that students had increased knowledge, understanding and awareness as well as ability to achieve the objectives of environmental education in the 6 areas of awareness, knowledge, attitude, skill, participation and ability to evaluate at a statistical significance of < 0.05.

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CHAPTER VI
CONCLUSIONS AND RECOMMENDATIONS

The objectives of the research in integration of environmental education for teachers of basic education in schools were to construct and evaluate the effectiveness of an integration environmental education model for teachers of basic education. It consisted of 4 steps: first to study the environment in the school and community, and integration of learning management and students' learning in environmental education, second to construct a model for the integration of environmental education with academic groups, third to arrange environment activities for teacher basic education and finally to evaluate the effectiveness of the integration of environmental education model with academic groups. Research conclusions are as follows:

6.1 Conclusions

Environmental education conclusions are: informants consisted of 400 students, 142 teachers (35.5%) and 258 students. Of the teachers 39 persons were males (27.46%) and 103 females (72.54%). The highest age was 59 years old and lowest age 23 years old with an average of 45.10 years. They were mostly Buddhists. The majority of them were in level 3 (Mathayom Suksa 1-3). Most teachers taught more than 1 academic group. Teachers had teaching experiences over 20 years (35.92%) with average experiences of 17.03 years and over 20 years as government officials (60.56%). Officials' employments averaged 22.11 years. For educational level, many of them graduated with bachelor degree at 85.90% with salary between 20,001-30,000 baht (49.30%) and average incomes of 24,003.47 baht/month. Family members were 3-4 persons with average 3-4 persons/family and most lived in Sampran district (40.80%), followed by Banglen district (24.65), Phuttamonthon (21.63%) and Nakhon Chaisri (21.63%), respectively. School and community environment data consisted of the following information. Soils 60.25% were clay, most were used for agriculture

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(77.75%). Soil pollution was from chemical residue (61.50%). Water consumption depended on underground water (46.75%) for agricultural purposes (56.00%) Water pollution was caused by garbage (38.50%). of the majority of respondents agreed that there were air pollution problem (72.50%).

Pollution was caused by dust (39.31%) from air pollution (31.50%). Most of them (86.25%) used electricity and problems were caused by the expensive cost of energy (84.50%). In the community, rice was the economic crop most grown (62.00%) and growing garden vegetables (95.25%) and (27.67%) growing chili were also common pursuits. For economic animals, chickens were raised (51.25%) and 87.50% raised animals for household consumption and 29.14% raised chickens as the number one economic animal.

Cultural concepts involved mostly the association between humans and the environment locally (86.75%) with people seeing themselves as part of the local environment. Most decisions-making in life was done through consulting the experts first. For group gatherings, most family quarrels were solved by stopping quarreling with no hard feelings (70.00%). For behavioral culture, incomes were used for foods (40.00%) and savings at the Bank (71.00%). Objects were culturally related to living in a single home (69.25%) and most owned their home (69.25 %). There were automobiles (38.25%), bicycles owners (46.50%), motor cycle (42%), television (42.75%), sound equipment (5.375%) and VCD and DVD (64.00).

Integration of learning management required students' qualification in responsibility, thirst for knowledge, having good relationship with teachers and friends (81.50%). Problems in integration of learning management involved lacking media in teaching. Most ratios used the core curriculum with academic group of 70:30 (42.50%). 100% portion (58%). Many schools integrated environmental education with academic groups (65.50%). Learning activity mostly preferred was integration with academic group (65.50%). Learning activities were mostly arranged in school (52.00%) and through thinking of arranging activities (41.25%). A problems in arranging learning activities was students had no time (45.75%). The computer was the most preferred media and technology item (45.50%). In the use of media and technology, schools had

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no budget for purchasing media (60.75%). Numbers of teachers in school were enough (65.75 %). Teaching was through lecturing mostly (58.75%). The ideal teacher must be kind and constantly taking care of students (41.50%). most agreed there were not enough teachers 36.75%. For evaluation of results, many schools used objective tests (30.7%) with improving learning (24.75%). For evaluation of students' learning, most answered there were no problems (56.00%). Learning results in academic groups showed cognitive domain with mean of 3.45 and standard deviation of 0.61 showing a good level. The affective domain had a mean of 3.52 and standard deviation of 0.72 indicating a good level. Student Environmental Education results displayed in mean and standard deviation consisted of awareness, with mean of 4.31 and standard deviation of 0.69 indicating a very good level. Second, knowledge showed mean of 3.98 and standard deviation of 0.67 indicated a good level. Third, attitude with mean of 4.20 and standard deviation of 0.74 indicated a good level. Fourth, skill with Mean 0.67 and fifth in participation with mean 3.70 and standard deviation 0.70 indicated good level. Sixth was the ability to evaluate results with mean 4.29 and standard deviation 0.79 indicated very good level. To summarize, the overall picture for all 6 areas showed a mean 4.03 and standard deviation 0.55 indicating a good level.

Conclusions in the construction of Integration of environmental education model for teachers of basic education with academic are as follows: unit 1 introduction stated the objectives of this research and steps for research methodology. unit 2 environmental education, unit 3 integration learning management, unit 4 environmental education, unit 5 environment, unit 6 academic groups and unit 7 conclusion on integration of environmental education and academic groups.

Environmental education process for teacher basic education was concluded in step 1 with findings of teachers having good knowledge and understanding in presenting all 3 contents quite well. Second step was involved in the construction of integration of environmental education to find the application of webbed model. Third step involved determining direction and integration plan for teachers to integrate with 8 academic groups and transmit knowledge to students at school with 1 teaching session, starting from May 2007 to October 2007 with the application of the webbed model.

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In the evaluation of effectiveness in Integration environmental education for teacher basic education, evaluation results were divided into 2 parts with 32 teachers and 718 students. Learning comparison between teachers and students of academic group consisted of cognitive domain, affective domain and psychomotor domain with overall mean 3.60 and 4.49, pre and post comparison. Learning results of 8 academic groups showed statistically significant differences (< 0.05). Learning comparison among teachers with 8 academic groups classified in class level 1 consisted of cognitive domain, affective domain and psychomotor domain, pre and post comparison of means 3.47 and 4.57. In class level 2, it consisted of pre and post comparison of mean 3.42 and 4.39. In class level 3, it consisted of comparison of Mean 3.49 and 4.58 and in class level 4, it consisted of pre and post comparison of Mean 4.00 and 4.42. In conclusion, in all 4 class levels, learning results in all academic groups showed statistically significant differences at <0.05. Comparison of learning results in Environmental Education among teachers consisted of learning results in 6 areas of awareness, knowledge, attitude, skill, participation and ability to evaluate results. The overall picture showed Mean 4.09 and 4.62, pre and post comparison with statistically significant differences at 0.05.

For teacher environmental education, results based on classification from level 1 to level 4 consisted of awareness, knowledge, attitude, skill, participation and ability to evaluate results. Overall picture showed level 1 with Mean 3.47and 4.57, pre and post comparison , level 2 with Mean 3.42 and 4.39, pre and post comparison, level3 with mean 3.49 and 4.58, pre and post comparison, and level 4 with mean 4.00 and 4.42, pre and post comparison. In conclusion, all 4 class levels showed learning results in environmental education with statistically significant differences at <0.05. Comparison of learning results of students with 8 academic groups from class level 1 to 4 consisted of learning results in 3 areas of cognitive domain, affective domain and psychomotor domain. Overall picture showed Mean 3.40 and 4.23, having learning results in 8 academic groups with statistically significant differences of 0.05. For overall picture, class level 1 had pre and post average value of 3.63 and 4.32. In class level 2, pre and post average value showed 3.23 and 4.13. In class level 3, pre and post average value showed 3.37 and 4.13. In class level 4, pre and post average value

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showed 3.41 and 4.32. In conclusion, in all 4 levels, learning results revealed statistically significant differences at 0.05. Results comparisons in students' learning consisted of learning knowledge in awareness, knowledge, attitude, skill, participation and ability to evaluate results. Overall picture indicated pre and post average values at 3.87 and 4.47, respectively. Environmental education learning results showed statistically significant differences at 0.05. Students' environmental education results comparison classified by class level 1 to 4 consisted of learning in awareness, knowledge, attitude, skill, participation and ability to evaluate results. For overall picture, class level 1, pre and post average valued 4.09 and 4.56, class level 2 pre and post average valued 3.79 and 4.37, class level 3, pre and post average valued 3.71 and 4.37, class level 4, pre and post average valued 3.93 and 4.55. In conclusion, all 4 classes' levels showed statistically significant value at 03.05.

6.2 Research Recommendations

6.2.1 Recommendations From the Research Findings

1) School executives should encourage teachers to acquire more knowledge in environmental education for teaching at school.

2) Schools should arrange for more teaching media in environmental education and emphasize integration of environmental education with academic groups for teacher to use in teaching more.

3) Teachers who have participated in environmental education with academic groups should implement the approach immediately.

4) Media for environmental education activities should be modern. Teachers must be alert and continue adding activities in environmental education to make students aware of environmental problems at all times.

6.2.2 Recommendations for Further Research

More research on the construction of the Integration environmental education model and academic groups should be conducted.

1) More research on evaluation of results in environmental Education with integration learning for teachers of basic education should be arranged.

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2) Results from the integration of environmental education with academic groups should be closely and continuously monitored.

3) This research was done in a specific study for Banglen district, Nakhonpathom province. There should be further research in other areas.

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APPENDIX

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Integration of
Environmental Education
For Teachers in Basic Education Schools

A Model Submitted in Partial Fulfillment of The Thesis

For The Degree of Doctoral Of Education (Environmental Education)

Faculty of Social Science and Humanities

Mahidol University

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UNIT 1
INTRODUCTION

The research on the Integration of environmental education for teachers of basic education schools was aimed for the construction and evaluation of the effectiveness of integrated model in environmental education with different learning aspects which included the support of various concepts, theories and several researches studies. The research was done as participation action Research between the researcher, local scholars and school teachers by following the environmental education process, gathering data from the local scholars regarding school and community environment, school education management and students learning to use as data to analyze environment in school and community as the basis for constructing integrated model in environmental education for teachers of basic education in schools.

Research Samples were selected among teachers in 8 basic education schools, District 2, Nakornpathom province in order to gather general environmental education data in the school and community as the support data for primary data analysis and synthesis. Research process is comprised of four steps as follows: first phases is to study primary data related to environmental education in the school and community, managing integrated learning and students' learning while second phase is dealing with the construction of integrated environmental education model with various learning groups for teachers basic education school.

Third phase is arranging environmental education activities for teachers in basic education school and final phase involved with evaluation of model effectiveness as integrated environmental education with various learning groups for teachers of basic education school. These steps should lead to development in the teachers' ability to integrate environmental education with various learning as well as transmitting environmental knowledge to students to achieve the objectives of environmental education which could result in family and community developing and maintaining sustainable school and community environment as being illustrated in figure 1.

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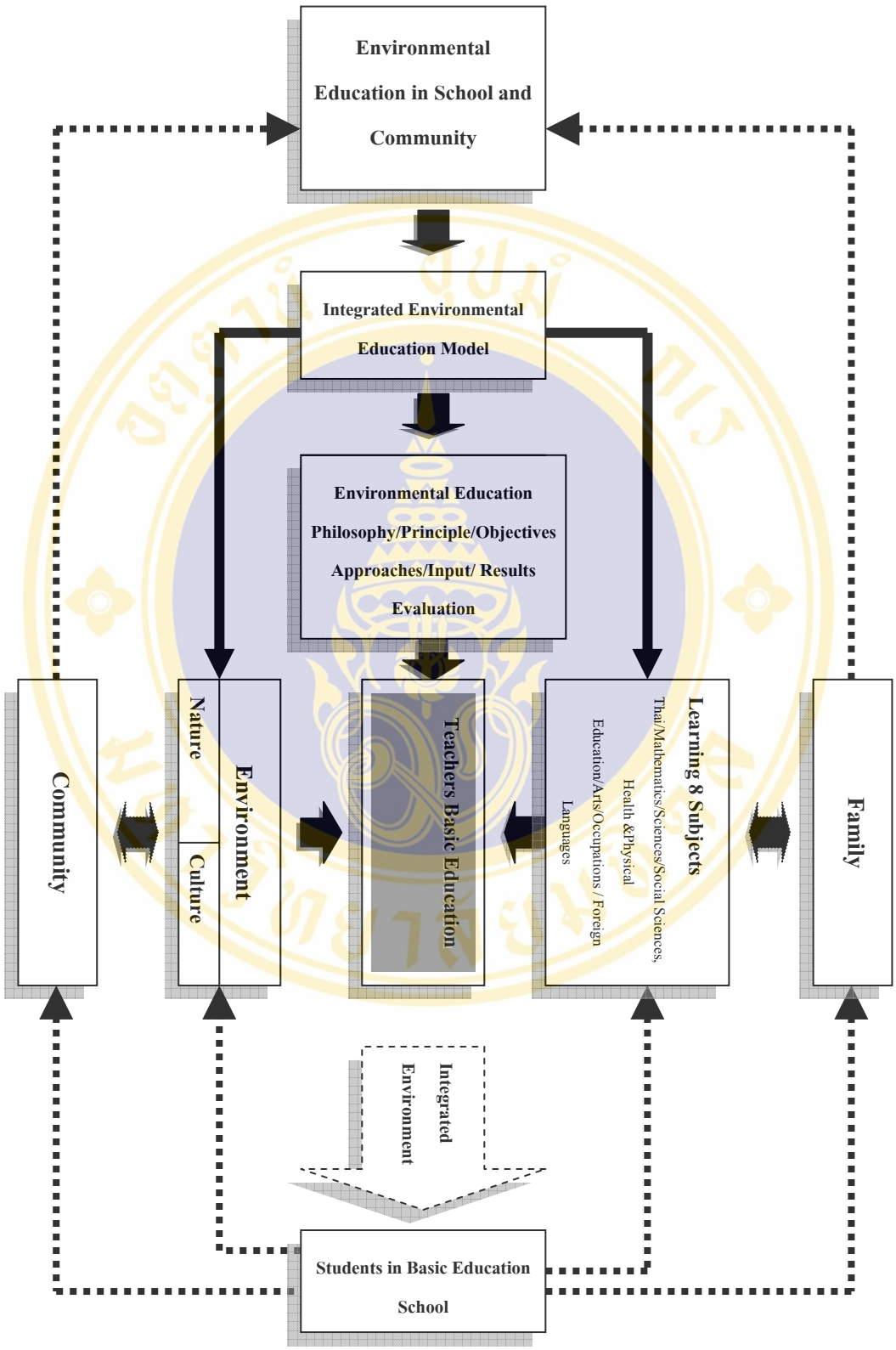

CHART 1: A Model of Environmental Education for Teachers Basic Education in Schools

Source: Synthesis from Research Results

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UNIT 2
ENVIRONMENTAL STUDY

2.1 Introduction

Environmental study is the survey of data necessary for constructing integrated model in environmental education with various learning subjects for teachers of Basic Education Schools which consisted of data that must be studied in 3 parts as follows: first in school and community environmental, second in integrated learning and third in students learning. All data in 3 areas should lead to the analysis and synthesis of integrated model in environmental education with various learning subjects for increasing teachers' knowledge in environmental education and various learning subjects and able to transmit knowledge to students so that they could develop their own knowledge in environmental education and various learning subjects also.

Picture 1 School Surrounding in Educational Area, District 2, Nakhonpathom Province

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2.2Personal Data

The researcher had conducted the survey of personal data in the Educational District 2, Nakhonpathom for 4 districts as follows: Sampran, Nakhon Chaisri, Phuttamonthon and Bang Len through random sampling of 2 schools in each district with 1 primary school and 1 secondary school included for the total of 8 Schools. The researcher had applied questionnaire with teachers and students in school in the basic education school, but questioning students more than teachers. Teachers responding to questionnaire are more females than males with average age of 45.10 years which considered well prepared to transmit knowledge to students. One of teacher's important roles is arranging learning for students. With strong determination, teacher can help learner gain knowledge and achieve learning objectives. Majorities of teachers are Buddhists and taught 3rd level the most. In subject 8, teachers taught mainly in own subject instead of various subjects. As for teaching experiences of sample groups, most of them had average 17. 03 years of teaching experiences and average 22.12 years as government officials. Mostly graduated with Bachelor degree and able to analyze and provide reasonable answers with average income of 24,033.47 baht. Most of them married and lived with members average 4.42 person per family and resided mostly in Sampran district (Somkid Issarawat: 2000, 31).

As for students' data, questionnaire respondents were more females than males with average age of 13.51 years which considered intelligent teenage learners capable of understanding contents of different subjects quickly. Therefore, teacher must be patient when transmitting knowledge to students because teenage students usually have less concentration than older students. Majorities of them are Buddhists with average members of 5.02 persons per family. At present, constant change in Thai society has separated more family apart. Therefore, in a single family, there is only a father, a mother and children. Most of them are living in Bang Len district and studying in 2nd level (Prathom 4-6) (Surang Kwotakul: 2005, 89).

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2.3 School and Community Environmental Data

2.3.1 Soils

Regarding soils in Nakhon Pathom province, finding form primary survey in 4 districts of Sampran, Nakhon Chaisri, Phuttamonthon and Bang Len indicated that most soil is loose and rather sticky quite proper for agriculture as well as local people have carried experiences and transmitted agricultural wisdom from ancestor to their offspring such as growing rice, garden vegetables, breeding fishes, fishery and others. Occasionally, pollution such as chemical residue remains in the soils because farmers are lacking knowledge and understanding in the use of chemical and pesticide.

Picture 2 Soils Suitable for Growing Farmers' Economic Crops and Household Vegetables at Bang Lane District, Nakhonpathom Province

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2.3.2 Water

Water used by 4 districts of Nakhon Pathom in Sampran, Nakhon Chaisri, Phuttamonthon and Bang Len in the communities comes from underground. Underground water used by most villagers for consumption is considered cleaner and purer than water in the rivers or canals which is used in agriculture mostly. Waste water or pollution in the water is resulted from large amount of garbage.

Picture 3 ThaCheen River as the Important Water Source in Bang Len District, Nakornpathom Province

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2.3.3 Weather

From the survey of most schools and communities in Sampran District, Nakhon Chaisri District, Phuttamonthon District and Bang Len District, the air is too dusty from air pollution caused by many trucks.

Picture 4 Traffic State in the Area, A lot of Nakhonpathom with an Automobile, The Cause of Dust Problem.

2.3.4 Energy

Energy usage occurred heavily in Sampran dfistrict, Nakhonchaisri district, Phuttamonthon district and Bang Len District of Nakhonpathom which had encountered problem with high cost of energy.

2.3.5 Plants

Rice is the number one economic crop mostly grown in the community at Bang Len, Nakhonpathom province, next in line is chili, holy basil and lemongrass, respectively.

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Picture 5 Farmers Growing Rice as Economic crops for Distribution and Household Consumption at Bang Len District, Nakhonpathom Province

2.3.6 Animals

Animals mostly preferred at Bang Len District, Nakhonpathom district is chicken raising for household consumption and distribution, following by ducks.

2.3.7 Cultural Concepts

Regarding cultural concepts in association between human and local environment at Bang Len District, Nakhon Pathom, Most of local people agreed first that human is a part of local environment, followed by those who thought of all things on earth are never lasting.

2.3.8 Group Gathering Culture

Bang Len District, Nakhonpathom province has community group gathering culture in many areas and when there is family quarrel, many people stop quarreling with no hard feeling. If it is community quarrel, the community senior or community prominent figure would intervene to stop the disagreement.

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Picture 6 Display of Elephant Duel in Thai History as the Cculture for Group Gathering of Villager in Nakhonpathom Province

2.3.9 Cultural Behavior

As for cultural behavior of people in Bang Len District, Nakhon Pathom province in spending behavior, community people spent money mainly on foods and saved some in the bank.

2.3.10 Cultural Object

Cultural object is having shelter to live in. Most of community people preferred single house which built in own land with convenience gadgets such as automobile, television, stereo, VCD, refrigerator, washing machine and microwave. Majorities of them have all 8 gadgets, but only allow 1 piece per household.

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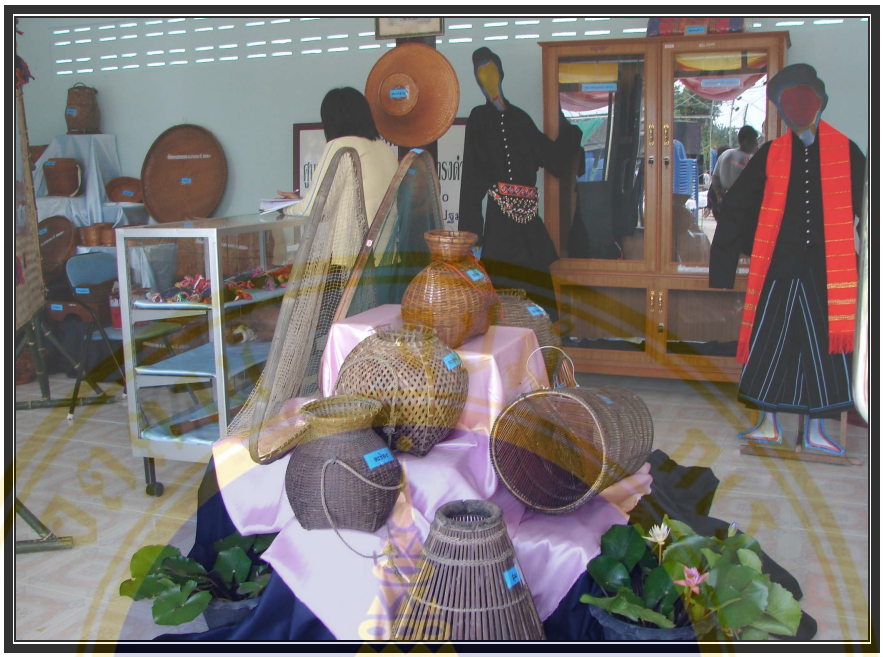

Picture 7 Utensils and Handicrafts of Thai Song Dum, Bang Len District, Nakhonpathon Province

2.4 Integrated Learning Management

Schools in Education Area 2, Nakhon Pathom province located in 4 districts of Sampran, Nakhon Chaisri, Phuttamonthon and Bang Len had integrated students' learning together. Students should be responsible to themselves and friends. Findings from questionnaire indicated that many schools had inadequate teaching media. The ratio application of core and local curriculum was 70:30 in preparation for most teaching and nearly 100%. Integrated learning between subjects and environmental education mostly integrated.

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Picture 8 Integrated Learning of School Students Through Printing Materials for Learning in School at Bang Len District, Nakhonpathom Province

Learning Activities

Majorities needed learning center established at school and the most preferred activity involved with academic promotion. The problem was many students had no time to arrange activities.

Media and Technology

Findings from the survey that the school preferred the use of computer, but the problem in the use of media was insufficient budget for acquisition, only few teachers available and mostly narrated. Ideal teachers must be kind and considerate, willing to care for students regularly.

Arranging Learning Process

In many sample schools, strategies were set for learner center by planning learning process and determine purposes to coincide with expected learning results. Encountered problem in arranging learning process was students lacking enthusiasm for learning.

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Results Evaluation

Most school used objective test in the assessment and learning results were applied with learning management for improvement. Most schools had not encountered any problems in learning assessment.

2.5 Environmental Education results among students in various subjects

As for cognitive domain, average learning was at 3.45 in good level while affective domain average 3.64 in good level also. Overall average learning was as equal as 3.53 in good levels.

2.6 Students Environmental Education Results

1) Awareness average 4.31 at excellent level
2) Knowledge average 3.98 at good level
3) Attitude average 4.20 at good level
4) Skill average 3.74 at good level
5) Participation average 3.70 at good level
6) Ability to evaluate results average 4.29 at excellent level

Conclusion: Overall Average Learning of 4.03 as in good level

2.7 Problems, threats and recommendations

Recommendation 1: Lots of garbage in the community, but only few garbage cans with damaged wastes incinerator. There should be system for proper garbage management and hazardous wastes are waste products of industry that if not disposed of property or destroyed, pose a threat to the environment. (Daniel D. chiras, 1991: 424).

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Picture 9 Garbage Problems in the School and Community

From picture 9 As environmental resource are used and transformed in order to archive development and after ration of the ecological system becomes inevitable. (United nations Asian and pacific Development Institute. 1976).

2.8Conclusion

Findings from primary survey indicated that students and teachers questionnaire respondents in the area were more females than males, mostly Buddhists and taught in the 3rd level the most in subject 8. Majorities of teachers taught in own group rather than teaching in various subjects. As for teaching experiences of sample groups, they had been teaching for over 20 years and working for the government more than 20 years also. Mostly graduated with Bachelor degree and received average monthly income of 25,000 baht. Most of them married with average 3.5 members per household and lived mostly in Sampran district. As for students data, questionnaire respondent mainly were females than males, with average 3.5 members per household and lived mostly in Bang Len district and studied in 2nd level (Pratom 4-5) mostly.

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UNIT 3
INTEGRATED LEARNING MANAGEMENT

3.1 Introduction

Integrated learning management is the development model for students to know may aspects in the same time and the approach for integration in environmental contents in school. However, it cannot fully develop and integrate with all 8 academic groups as well as unable to develop teacher's ability to transmit knowledge successfully, create good learning results for learners and increase desired results in intellectual ability, mind ability and skill ability. Learners can achieve objectives of environmental education when they have awareness, knowledge, attitude, skill and participation and evaluation on Ability. These results help to develop sustainable environmental knowledge, leading to better life quality of school and community.

Picture 10 Integrated Learning Model in Vocational School

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Picture 11 Integration Learning Model in Bang Len District School

3.2 Meaning of Integration learning Management

Integration has many definitions. For educators, integration curriculum may be defined as Integration learning management. The meaning of integration has twofold meanings, in the general meaning and the specific meaning. In the fist meaning, the separate units were combined into one unit (Dictionary of Royal Institute, 2525 B.E.)

Another meaning is specifically defined as holistic knowledge in education sciences. Integration is defined as mixing sciences in relevant subjects for managing Integration Curriculum. The combining contents of each subject made its strong point disappear and creating new identity of Integration curriculum. This is completely making small related units collaborated together in one holistic view (Phra Thepvaithee, 1988:24).

Integration learning is to link contents in academic groups in Thai language, mathematics, sciences, social studies, religion and culture, health and physical

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education, art, occupation and technology and foreign languages together in learning so that learners could link knowledge and apply with real life.

Integration Instruction puts more emphasis on holistic contents than holistic knowledge of each subject and more on learner's learning than subject contents. However, there is no guarantee that integrate curriculum would be used in managing Integration Instruction. As evidence in the past, even with integration curriculum, integration instruction was done as lecturing in each subject.

Integration Instruction management is done with 2 approaches: integration within subject and between subjects. Integration within subject puts the emphasis on the same subject while integration between subjects links between concepts in more than 2 subjects under the same theme. It is learning from knowledge, understanding and skill in more than 1 subject to solve problems or search for knowledge and understanding the connection between knowledge and skill between subjects so that learners can have profound knowledge closely related to real life.

3.3 Type of Integration learning

3.3.1 Integration of informal subject is taking 1 main subject and inserting contents of similar subject.

3.3.2 Integration between subjects is separation of each subject by determining topic of conceptual framework and the same problem.

3.4 Integration learning Model

3.4.1 Infusion is inserting contents by one instructor responsible only in his own teaching and insert content of other subject in his teaching

3.4.2 Parallel is teaching by 2 or more teachers in different subjects but both teachers must get together to plan teaching, determine similar topic, concept and problem.

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Picture 12 Integration Learning Through Teacher Environmental Process

3.4.3 Multi disciplinary is similar to parallel teaching, but assign the same project that link different subjects together to separate into smaller projects for students to work on in each subject.

3.4.4 Trans disciplinary is when teachers join together to teach as a team by consulting with each other, determining topic, concept and problems together before start teaching.

3.5 Integration Components

3.5.1. Integration started from Integration curriculum, analysis problems and conditions, learner's needs. It is the curriculum arrangement by brainstorming higher and more complex subject contents with results evaluation.

3.5.2. Integration of contents is done with analysis, plan teaching and work collaboration. Learner, teacher, administrator and personnel must be fully cooperated and capable of carry on with the work to make it successful.

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3.5.3. Measuring evaluation results coincided with integration based on work collaboration. Criterions for measuring evaluation results must be different from regular measures.

3.6 Integration curriculum

Integration curriculum by UNESCO in education, science and international culture (UNESCO 1981: 7-10) has significant features as follows:

3.6.1 Integration of Knowledge and Learning Process is curriculum significant components. Because modern society has become more complex and holistic knowledge increased rapidly, curriculum must be emphasized more on learning process rather than holistic knowledge to make learner able to develop approach and access desire knowledge.

3.6.2 Regarding Integration of Cognition and Affect, there had been some comment on the actual condition of teaching. It seems like Objectives of Affective Domain has received less attention than Cognitive Domain. In principles, they should be equally important. Therefore, Integration curriculum should, concept and to attitude together.

3.6.3 Integration of Knowledge and Conduct should receive same attention as association between knowledge and attitude. Separation of knowledge from conduct can be done by dividing curriculum contents into 2 parts. Therefore, Knowledge should be integrated together with Conduct.

3.6.4 Integration of School Learning with the Actual Life of the learners is done to achieve true goals of Integration curriculum. It should be meaningful or help learners to better their lives outside school. Some Integration curriculum emphasized on teaching process that based on learners' interests and needs, including actual life activities.

3.6.5 Integration of Subject Areas together is to link similar stories together to create new contents. This type of integration is valued and quite popular. In

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teaching the subject, teacher should not pack the whole concept into the single topic but pay the most attention to investigation process without separating contents in various subjects, but rather including the fact and principles in managing education, attitude process and action as important as including contents.

Picture 13 Integration Learning Process Management in Classroom Basic Educational Level

3.7 Integration learning Model Methodology

Knowledge is the most outstanding component of curriculum structure in all academic groups which suggested what kind of knowledge are given to the students, how to mix learning process skill, capacity, value and ethics with learning and how to integrate knowledge in each subject with other academic groups

.

In each academic group, skill involved is always identified, whether being mathematic, science, social studies, religion and culture, Thai and foreign languages, occupation and technology, art or health and physical education all included skills.

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Curriculum structure framework has included knowledge, skill, attitude, value and ethics in determining learning results or learning objectives in each class span. This is done as the guideline for teacher to determine learning objective in teaching or learning management planning further.

3.8 Nature of Integration learning Management

Many integration models are based on criterions for classification.

Model 1: Number of teachers

1.1 Single teacher

1.2 Parallel teaching

1.3 Team teaching

Model 2: Academic groups

2.1 Within academic groups

2.2 Between academic groups

Model 3: Integration type

3.1 Multi disciplinary

3.2 Multiple disciplinary

3.9 Integrated Webbed Model

Integrated Webbed Model is when teachers in different subjects get together to plan topic related to social problems or issues that needed closely related to real life event which should make integrated Webbed Model more effective.

Integrated Webbed Model is consisted of the following steps:

3.9.1. Determine Theme which may be Topic selected by teachers from curriculum and social changes, considered from each subject explanation to be integrated together or determined by school. In case of disagreement, teachers must consider the learner's benefit from learning experiences that can be applied most in real life.

3.9.2 Plan teaching in 3 models as follows:

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1) Teacher for each subject would integrated together to coincide with the design subject and timeframe such as 2 weeks or 1 month.

2) Teacher would design teaching plan together and teach accordingly by dividing teaching hours based on topic.

3) Teacher for each subject teach based on planning together as teaching project.

3.10 Chart of Webbed Model

Webbed model constructed for life experience group, Thai language, mathematic and art, Prathom 6 for homeroom teacher to coincide with Theme and topic within 2 weeks.

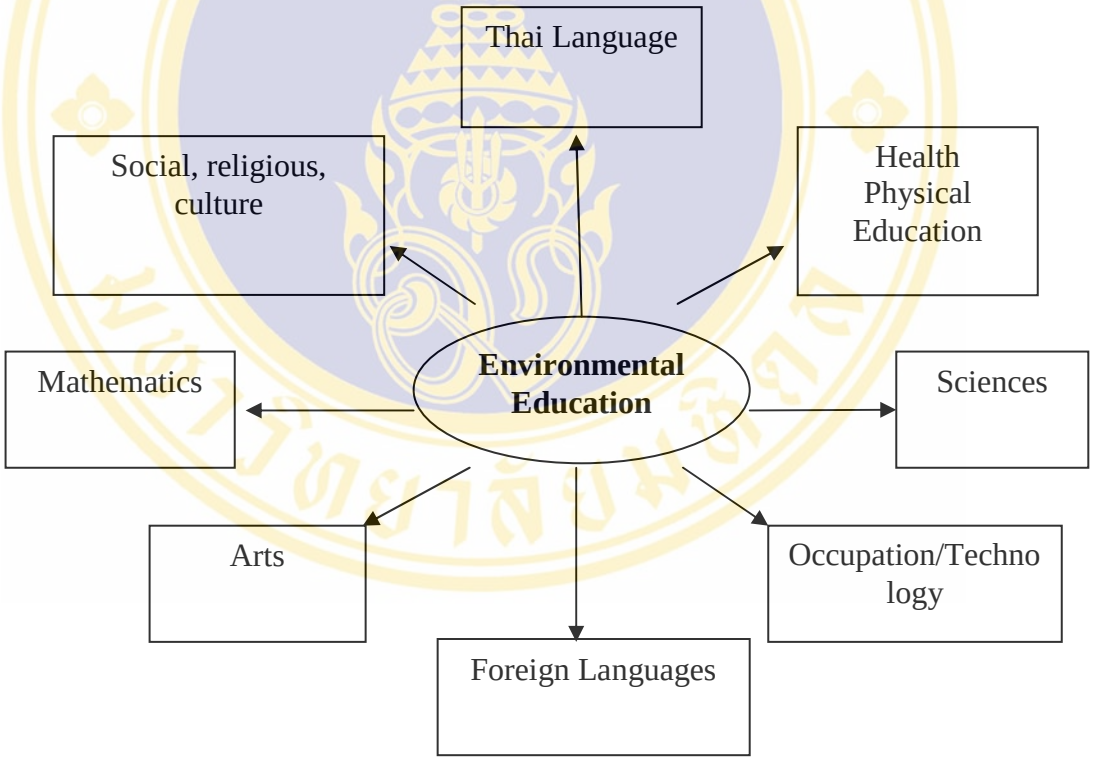

Figure 2 Integrated Environmental Education with 8 Academic Groups as Webbed Model

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Picture 14 Integrated Informal Learning in Natural Classroom in Basic Education

Picture 15 Integrated Environmental Education with News Printing Board

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3.11 Problems from teaching webbed model

Teacher was unable to summarize topic which created problems in plan teaching and losing timing. Problems may be solved by asking the academic groups to determine topic or teacher to arrange more activities rather than having just concepts.

3.12 Benefits from integrated teaching

1) Old knowledge connected with new knowledge makes learning faster and unforgettable

2) Mix knowledge with association can be applied with daily life activities

3) Learners understand social conditions and problems better than learning from social actions or phenomena. Understanding problem until able to solve such problem requires knowledge from different sources to build new knowledge.

4) Adding more value to teaching and education from not being only the process to transmit knowledge but also emphasize on skill development to create correct concept and desired value.

5) Changing education or teaching objectives from giving knowledge to learner to learners perceive value and application of knowledge.

3.13 Conclusion

Integrated Environmental Education curriculum model with academic groups including in Environmental Education process for basic education teacher is training teacher to integrate Environmental Education effectively until being able to transmit integrated Environmental Education to students in all 4 school levels in basic education which should make students achieve objectives of Environmental Education in awareness, knowledge, good attitude and skill, participation and results evaluation.

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UNIT 4
ENVIRONMENTAL EDUCATION

4.1 Introduction

Environmental education is the process to transmit environmental knowledge through education to develop human to appreciate and value environment systematically with the objectives to create awareness, knowledge, attitude, skill and participation and evaluation on ability. These events would lead to thinking and doing and solving problems as mentioned earlier. It can be seen that environmental education is planning the learner for self-developed in environment, enabling to apply environmental education process to improve human spirit and create good environmental changing in human society, leading to further sustainable environmental development. (Sean Mc B. Carson, 1978)

Picture16 Environmental Education in Basic Education School

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4.2 Educational Philosophy and Environmental Education

4.2.1 Meaning of Philosophy

Philosophy has its root from Greek word Philo defined as love, interest, worship. According to Sophia, Philosophy is defined knowledge and sharpness. After combing two words together, it would mean love in sharpness. Philosophy has vague explanation which can be classify as philosophy based in 3 branches or field subjects as follows:

1) Ontology is the explanation on Reality that philosopher tries to inform about what is actually going in the world and what is real in all cases. Philosopher in this field tries to search for great truth covering the possibility of all things on earth and this Universe. Group thinker beliefs that if we can teach students this whole truth, there is no need to teach them many subjects as currently taught.

2) Epistemology is the explanation of how a person perceives fact or truth. Philosopher in this field would try to explain approach for making human understand the actual fact

3) Axiology is the effort to explain goodness and beauty as the application of Metaphysics and Epistemology with human behavior and display emotion. The philosopher in this field should try to find the explanation for which is good or bad.

4.2.2 Educational Philosopher and Environmental Education

Environmental Education originated from the idea to solve environmental problems with education. It was apparently shown in 2515 B.E. (1972 A.D.) at the United Nation meeting on Human Environmental issue at Stockholm, Sweden. It had been concluded that Environmental Education could be important instrument for long-term problems- solving and improving environmental quality. Later, in the year 2518 B.E. (1975 A.D.), UNESCO had arranged the meeting in Environmental Education at Belgrade, Yugoslavia to request world countries to provide Environmental Education to people in their own country and declare The Belgrade Charter with the following intention:

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"Individual and society must have ethics to promote proper attitude and behavior suitable for staying in Biosphere which requires the understanding of nature and changes to interrupt relationship between human and nature and between human. The core of building new ethic is education which must be reformed for the entire system and the educational process so that the young can be educated and created new relationship between teachers and students, school and community as well as building modern educational system for long term problems-solving. Furthermore, there has not been any announcement that every country must plan environmental education project to develop people for new knowledge, skill, value and attitude, leading to quality environment and better livings for everyone now and future.

Picture17 Environmental Education Through Printing Media at School

From previously-mentioned statement, Environmental Education has direct goals that bringing society out of existing problems. Therefore, education can help solve problems or reform society or what is being called Recontortionism that must be arranged as follows:

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1) Put the emphasis learner's role towards society and local in correcting environmental problem and awareness whether environment can unavoidably affect his well-beings.

2) Arrange Environmental Education to put the emphasis on social experience and by society as the center to mange education and direct learner to analyze own social problems.

Picture 18 Model of Environmental Education at School

3) Give attention to academic groups by putting the emphasis on academic groups responding to protection and solving environmental problems.

4) Teach process with the application of science with investigation, observation and analysis for reason so that learner can access relationship between various components and able to understand environmental problems and access the real cause of problems.

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5) Give value to culture and humanities to promote individual with attitude and proper behavior for staying on earth ecosystem.

6) Find concept or new technique for application in solving environmental problems by searching guidelines for Interdisciplinary Approach.

4.2.3 Environmental Education Philosophy that based on environmental education principles is consisted of:

1) Providing environmental knowledge is the Continuous lifelong process from birth to death.

2) Environmental Education is the process to create certain things tin thinking, doing and solving problems.

2.1) Knowledge is the profound knowledge until becoming the applied concept and problems-solving method

2.2) Proper and accurate attitude come from having good knowledge.

2.3) Awareness is sub-conscious so that a person able to recall the same event when encountered problems.

2.4) Sensitivity is responding to influence objects quickly.

2.5) Skill is the expert and accurate practice.

2.6) Participation is having association with other as well as presenting opinion or assistant

Knowledge provision approach requires suitable contents, application of environment technology and respondents to build understanding and practice in all 3 areas to achieve results in Environmental Education as plan. In the past, error came from a mistake in one area or mistakes in all areas

.

4.3 Environmental Education Principle

Environmental Education Principles of The Belgrade Charter had defined guidelines for Environmental Education as follows (UNESCO, 1976: 2)**:**

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1) Environmental Education must consider Holistic View in both nature and man-made environment, including ecology, politic, economy, and social, laws, culture and aesthetic.

2) Environmental Education should be Continuous Long Life Process that had been set up inside and outside the system.

3) Environmental Education should be Interdisciplinary Approach which is content of environmental education resulted from mixing different type of knowledge together to help learner to see the overall picture of environment.

4) Environmental Education should put the emphasis on prevention and solving environmental problems.

5) Environmental Education must look at overall world picture and at the same time concerning about differences in each region.

6) Environmental Education should emphasize on current and future environment

7) Environmental Education should look at all progress that already happened.

8) Environmental Education should promote value and necessity in prevention and solving environmental problems in local level, nation level and world level.

Picture 19 Environmental Education teaching at school, Bang Len district, Nakhonpathom province

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Environmental Education Objectives aimed for individual and society to achieve certain thing in the following areas:

1) Awareness and sensitive feelings towards whole environment, including relevant problems.

2) Knowledge in the understanding basic foundation of environment, including problems and responsibility and human roles towards environment.

3) Attitude towards values and more feeling in environmental support and ready to participate in preservation and improvement of environment.

4) Skill to solve environmental problems.

5) Evaluation ability to evaluate environmental measures results, including the study of project related to ecology, politic, economy, society, aesthetic and education.

6) Participation to develop responsibility to find proper method for solving immediate environmental problems.

4.4. Environmental Education Model Construction

4.4.1 Preparation for initial data survey from the instructor in the Basic Educational Institution is being done as follows:

1) Documentary Research is the secondary data, searching from textbook, teacher teaching documents, documents explain details of each subject in 8 academic groups, academic documents, articles and others.

2) Selection of teachers in the Education Institute from 8 academic groups in 4 class levels.

3) Direct observation is made from teacher instruction among Basic Educational students.

4) In-depth interviewing teachers and experts by applying technique and interview method to find initial data on problems and obstacles for improvement and being able to integrate Environmental Education Curriculum effectively.

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4.4.2 Steps for constructing Curriculum

Curriculum for teacher derived from the survey of teacher's need through questionnaire and direct interview with experts, brainstorm and group discussion which consisted of learners, curriculum objectives, contents, teaching activities, teaching media, instructor and evaluation of results.

4.4.3 Steps for teaching teacher Integration Environmental Education

Integration Environmental Education is based on actual learning because teacher must concern about what subject learner would like to learn, what they want to do, what can they do and teacher must think of their own preference, what subject to be taught and what can he accomplish. In the process of teaching teacher should include determining topic, writing key contents, determining integration scope, determining general and specific purposes, teaching activities and media and evaluation of results.

4.4.4 Steps for Integration Training Teacher transmitting knowledge to students

Basic Education Curriculum has been designed for learners to balance mental and physical with integration among students by allowing student to do their own thinking through the following integration process.

1) Planning
2) Selecting teaching topics
3) Brainstorm
4) Recording additional knowledge base
5) Recording acquired data
6) Problems and problems-solving
7) Searching for more data
8) Recording work systematically
9) Summarize report
10) Presenting report

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Picture 20 Transmitting Vocational Knowledge to students

4.4.5 Teacher Evaluation Methodology

1) Evaluation from practice
2) Evaluation from integration
3) Evaluation from participated learning

4.4.6 Evaluation Methodology

1) Pre-test and Post-test questionnaire
2) Observation from group work and participation
3) Self-assessment
4) Group behavior observation

4.5. Environmental Education curriculum with academic groups

Curriculum for basic education came from surveying the need of teacher through questionnaire and interview directly with expert and brainstorm with group discussions to derive at desire curriculum.

4.5.1 Learners or targeted groups for Integration Environmental Education are teachers who taught 8 academic groups in 4 class levels in the Basic Educational Institute.

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Picture 21 Learning Management in Basic Education School

4.5.2 Objectives

The objectives of Integration Environmental Education Curriculum for basic education teacher are involved in building teacher capable of transmitting Integration Environmental Education knowledge to student effectively by having key objectives as follows:

1) To help learner to develop knowledge, create understanding, analyze and synthesis and have conceptual framework for Integration Environmental Education Curriculum.

2) To build good attitude among learner with appreciation, value and confidence and awareness towards Integration Environmental Education Curriculum.

3) To provide learners with skill, process in practice that can be display in observation, survey and application in Integration Environmental Education Curriculum.

4.5.3 Curriculum Contents

Curriculum contents are key component for curriculum, especially in Integration Environmental Education contents which can be blended in specific issue,

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changed and flexible as well as being the parallel method to provide wide knowledge and vertical method as in-depth knowledge.

Integration Environmental Education Curriculum contents should include the following areas:

1) Environmental Education

1.1 Preface

1.2 Results from the study in personnel data

1.3 Data on school and community environment

1.4 Data on integrated learning management

1.5 Learning results happened among students in different academic groups

1.6 Environmental Education learning results of students.

1.7 Problems, obstacles and recommendations

1.8 Conclusion

2) Integration Learning Management

2.1 Preface

2.2 Definition of Integrated Learning Management

2.3 Integration Learning Type

2.4 Integration Learning Model

2.5 Component effecting integration

2.6 Characteristic of Integrated Curriculum

2.7 Approach in Integration Learning Model

2.8 Characteristic of Integrated Curriculum Management

2.9 Integration Webbed Model

2.10 Integration Webbed Model Chart

2.11 Problems of Integration of Webbed Model

2.12 Benefit from Integration Instruction

2.13 Conclusion

3) Environmental Education

3.1 Introduction

3.2 Education Philosophy and Environmental Education

3.3 Environmental Education Principles

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3.4 Objectives

3.5 Methodology

3.6 Input

3.7 Result Evaluation

3.8 Conclusion

4) Environment

4.1 Introduction

4.2 Natural Environment

4.3 Cultural Environment

4.4 Association between Cultural Environment and Natural Environment

4.5 Conclusion

5) Academic Group

5.1 Introduction

5.2 Basic Education Curriculum

5.3 Conclusion

6) Conclusion

4.5.4. Learning Activities

In order to arrange activities in accordance to teacher development curriculum, Integration Environmental Education instructor should arrange activities as follows:

Arranging group discussion for learners to express opinion on various subjects and setting up guidelines to correct curriculum contents by asking learner to set up the issue such as how to Integrate Environmental Education with Thai language or other subjects.

Arranging the actual practice for learners to create Integration Environmental Education skills and asking them to point out differences between things that should have been and existing thing, identify negative and positive results with speech presentation, picture and practice.

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Brainstorming is to allow all students to express their opinion freely among students as well as motivate each learner to express idea, share experiences and accept other ideas.

Picture 22 Learning Activities at School

4.5.5. Teaching Media

Teaching Media for teacher in Integration Instruction must be appropriate for building attitude and skill among teachers by planning the use of media suitable with arranging learning activities. Preparation for various teaching media such as, text books, tape recorder, VCD, CD and other equipments to make it convenience for teacher to integrate Environmental Education Curriculum or self-learning should select various media for use.

1) Technology media is the transmitting Environmental Education knowledge from instructor through Video or VCD so that teacher can build knowledge or attitude towards Integration Environmental Education Curriculum.

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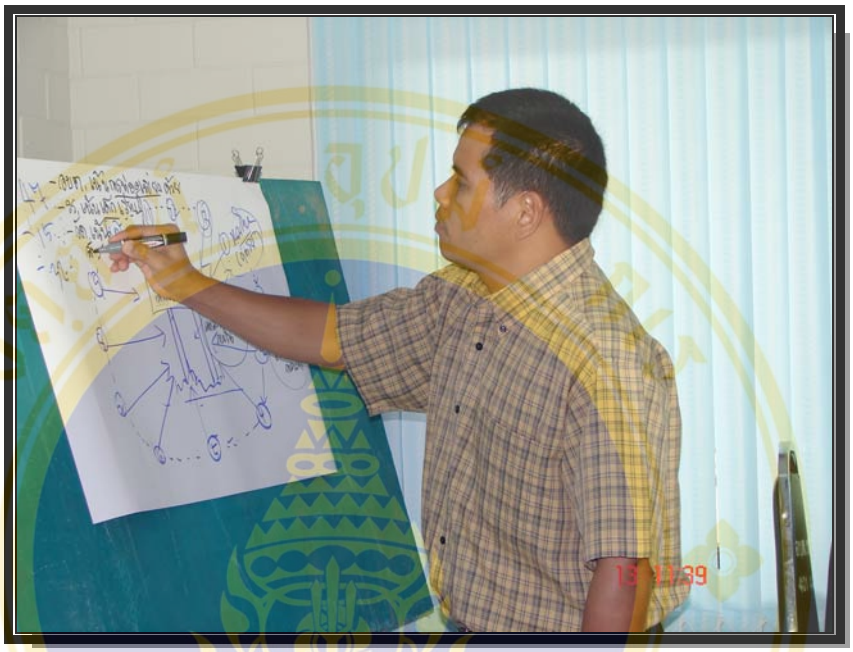
2) Learning media from lecturing is the transmitting knowledge from the expert to the teacher as being direct knowledge so that teacher can have knowledge, understanding, ability, strategy or concept, adapting for further use with the learners.



Picture 23 Lecturer transmitting knowledge through Narrated Model

3) Media from books or documents accompanied teaching to explain details of environmental education curriculum for students to know and understand content better.

4.5.6 Results Evaluation

It is result evaluation based on fact to coincide with integration by judging from cooperation in learning. Measures for result evaluation must be different from evaluation in 3 areas as follows:

1) Evaluation from learner practice in knowledge integration for good results during practice so that learner can have different skills from practice to link to curriculum integration

2) Evaluation from integration and linking curriculum

3) Evaluation from learning with participation in learning and teaching activities with group participation and operation

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4.6. Guidelines and Methodology

4.6.1 Guidelines and teaching method in basic education

Teaching method in basic education to integrate environmental education curriculum is being set up as follows:

1) Determine topic content, learning, teaching or curriculum name based on learners 'demand with concise and measurable contents.

2) Summarize key contents, bullet points as well as put emphasis on conceptual framework, skill and encourage good habits among learners.

3) Determine scope of integration contents by identifying content coverage for each subject and association with teaching.

4) Determine expected objectives of learners and what they could gain after finish studying such subject.

5) Determine teaching activities through System Approach in input and outcomes.

6) Evaluation on Ability is being done based on learning set objectives.

4.6.2 Guidelines and teaching method for transmitting knowledge to students to achieve the set objectives based on the following steps:

Step 1: Introduction

Teacher must inform learning objectives, contents process in each step.

Step 2: Presenting lesson

It is clear presentation of lesson with example

Step3: Practice

Teacher must show example for the learner to follow

4.7 Benefits from Integration

4.7.1 Teaching Integration Benefits

1) Teacher has knowledge in integrated environmental education for basic education.

2) Teacher has integration skill in environmental education and effectively linking with different academic groups.

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3) Teacher has good attitude about environmental education and effectively linking with different academic groups.

4.7.2 Results from teaching student

1) Providing knowledge in environmental education curriculum and making children aware of environmental preservation.

2) Creating good attitude toward environment and appreciation in environment

3) Creating skill for managing environmental education

4) Creating participation in thinking process, work collaboration and improvement

5) Capable of evaluating learning

4.8 Conclusions

Environmental Education is learning process of school students in environment by arranging educational process systematically to create desired learning results. So, there must be environmental education specialist with thorough knowledge and understanding in environmental education for transmitting knowledge to learner effectively, making learner achieve objectives of environmental education and deeply understanding environmental education value more.

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UNIT 5
ENVIRONMENT

5.1 Introduction

Human is considered as earth environment because all things on earth have own environment. Therefore, it is everyone duty to maintain proper environment. Most important, keeping nature equilibrium so that nature can maintain its natural state constantly because nature equilibrium destruction today is self-destruction in the future. Therefore, it is human awareness to preserve nature for sustainable existence. Such awareness can be created in many ways, but the provision for environmental knowledge and understanding to human at all ages or “Environmental Education” is interesting method.

Picture 24 Natural Environment at Garden Vegetable, Banglen District, Nakhonpathom Province

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5.2 Environment

Environment is defined as ourselves and everything that surrounding us. It can be classified into natural environment and cultural environment both resource and pollution as illustrated in the following Table:

Table 1 Environmental Classification

<table>
<tr><td colspan="5">Environment</td></tr>
<tr><td colspan="2">Natural Resource</td><td colspan="3">Cultural Resource</td></tr>
<tr><td rowspan="4">Non-Physical Environment</td><td>1. Soil</td><td>Internal Resource</td><td>External Resource</td><td></td></tr>
<tr><td>2. Water</td><td rowspan="4">1. Concept Culture
2. Organization / culture or Affection</td><td rowspan="4">3. Usage or Behavior Culture</td><td rowspan="4">4. Object Culture</td></tr>
<tr><td>3. Air</td></tr>
<tr><td>4. Energy</td></tr>
<tr><td rowspan="2">Physical Environment</td><td>1. Plant</td></tr>
<tr><td>2. Animal</td><td>Internal Pollution</td><td>External Pollution</td><td></td></tr>
<tr><td colspan="2">Natural Pollution</td><td colspan="3">Cultural Pollution</td></tr>
</table>

Source: Wee Rawang Ed. D, Environmental Education, Mahidol University . 2001

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Picture 25 Rice Paddy Cultivation by Farmer at Banglen district, Nakhonpathom Province

Picture 26 Natural Environment at Ta Chin River, Nakhonpathom Province

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Table 2 Community Cultural Factor

Concept Culture	Organization Culture	Usage Culture	Object Culture
1. thought 2. knowledge 3. attitude 4. values 5. belief 6. religion 7.folk dance 8. folk music 9. sculpture	1. family 2. relative 3. peer group 4. activity group 5. community 6. community networking	1. Language 2. social norm 3.education 4. occupation 5. income 6. consumption 7. saving 8. folk medicine 9. traditional activity 10. participation 11. skill 12. ritual 13. folklore	1. costume 2. resident 3. instrument 4. handicraft 5. infrastructure 6. painting 7. ancient monument

Source: Wee Rawang Ed.D, Environmental Education, Mahidol University, 2001

5.3 Cultural Environment

Earth has wide area which made natural environment such as landscape, weather and animals in each region features differently. Therefore, human settlement in each area of the world “Adapting nature for different benefit in life” (Table 2 and creates own unique identity or so called “Community Culture”. After combining communities’ unique culture in large scale, it is being called as “national culture” and many nations are getting together as “International Culture”. Lifestyles or culture can be divided into 3 levels as community culture, national culture and international culture as being illustrated in chart 2.

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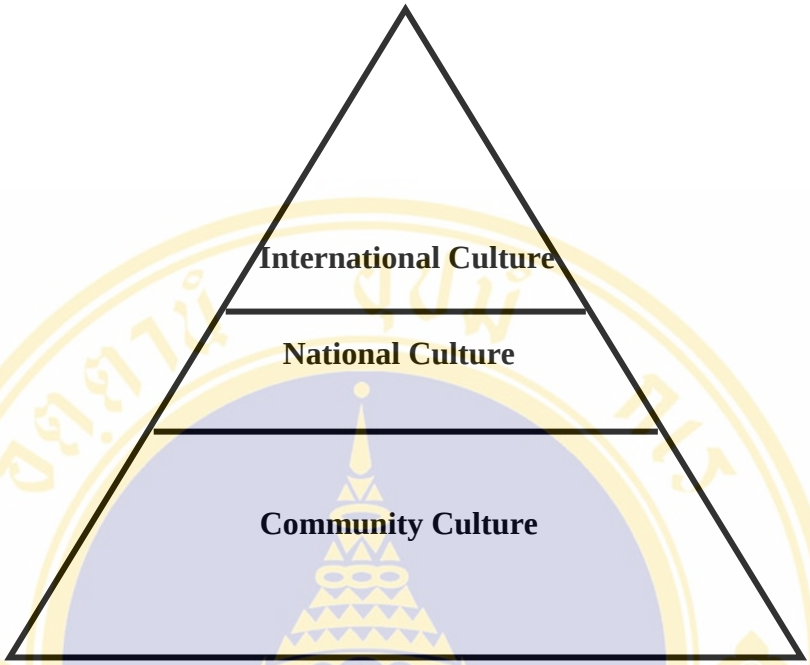

Figure 3 Cultural Classification
Source: Ministry of Education, 1995: 84

5.4 Association between Cultural Environment and Natural Environment

Human is one type of Bio Environmental, but human can develop himself quicker and more complex. Then, human decided to separate himself from animals and building specific approach to adapt natural resource for human daily activities. Such process is being called “Culture” or “Lifestyles” and Phra Tumpidok (Po Or Pa Yutto, 1994: 11-15) stated that “culture in any level must not violate natural rules” which actually is the “truth” to make nature and earth co-exist in harmony. So, human must have ethics as the guideline to link between “Cultural and truth”. Therefore, lifestyle or culture in ethnic frame is important guidelines which help human species remain comfortably within equilibrium natural environmental surrounding as being shown in chart 3.

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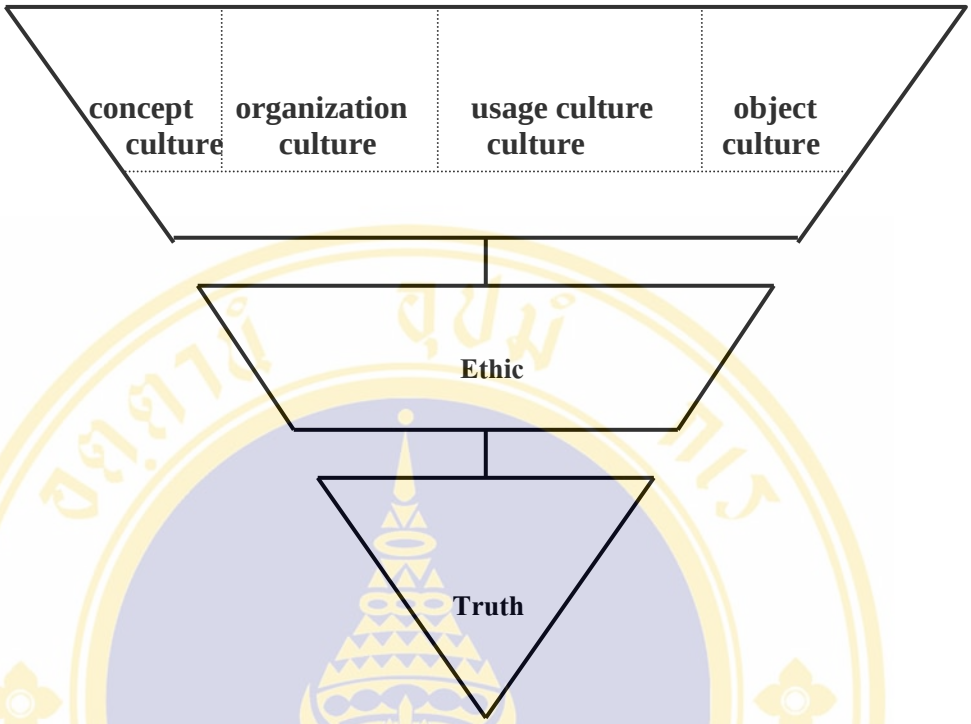

Figure 4 Association between Cultural Environment and Natural Environment

Source: Wee Rawang, Ed.D. Environment Education, Mahidol University, 2001

5.5 General Condition of Banglen district, Nakhonpathom province

Picture 27 Automobile Traveling route to Banglen district

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Banglen district is located 67 kilometers further from Bangkok Metropolis. It can be reached by traveling through Poldumri Road, along Highway 3296 (Banglen district, Muang district, Nakhon Pathom province) connecting with Nakorn Chaisri Road-Pinklao for 80 kilometers. Banglen occupied area of 588, 836 square kilometers (368,022.50 rais) with total population 87,811 persons, separated into 43,107 males and 44, 704 females. It has population density of 419 persons per square kilometer. There are total 20,053 families and the same number of household for 179 villages and total 15 sub district for 4 municipality areas.

1) Location: Banglen district is located on central plain with Ta Chin River flowing through. It has the area of 588, 836 square kilometers or 368, 022. 50 rais or 40 kilometers further from Nakorn Pathom and 67 kilometers from Bangkok Metropolis with boundary adjacent to nearby province and district as follows:

North is adjacent to Song Pee Nong district, Suphan Buri province and Lad Buo Luang , Phra Nakhon Si Ayutthaya province

South is adjacent t o Phuttamonthon district, Nakhon Chaisri district, Don Toom district, Nakhon Pathom province

East is adjacent to Tsai Noi district, Nonthaburi province, Lad Buo Luang district, Phra Nakhon Si Ayutthaya province

West is adjacent to Don Toom district, Kam Paeng Saen, Nakhon Pathom province

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Picture 28 ThaCheen River, The main Communication Route of Banglen District, Nakhonpathom Province

2) Geographical feature: Most areas of Banglen district is the plain without forest and mountain. Ta Chin River has flown through the area from the North to the South which divided areas into 2 parts. There are many canals separated from Ta Chin River suitable for agriculture such as Klong Banglen, Klong Phra Pimol, Klong Bang Luang, Klong Bang Tsai, Klong Bang Pasee, Klong Nokka Tung and Klong Narapirom.

3) Weather: It is similar to other districts and provinces in central region with northeast monsoon passing through in October to February and southeast monsoon from South Sea passing through in the middle of February to May from the influence of such Monsoon.

4) Administration: Administration is divided into 15 districts and 179 villages and Local Administration in 4 Municipal areas and 15 Sub District Administration with total population of 87,811 persons.

Important water source is Ta Chin River flowing through Banglen district with 30 5) Natural resource: kilometers.

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6) Economic situation: Population made their livings from agricultural occupation such as growing rice, fruit trees, field crops, vegetables. Furthermore, they raised animals, breeding fishes, working in industry and commercial.

7) Communication and Public Utilities**:** Banglen district, Nakhom Pathom has asphalted roads for convenient traveling. All districts have lump literate road connected between villages. Communication between district and province can be done conveniently through land (automobiles) and water (ships). For utilities, electricity is generated by Provincial Electrical Authority and able to service people in all districts. Provincial Water Work and Village Water Work is responsible for distributing water but not for every household. Tour sites mainly are Ancient Monuments, Ancient artifacts, Cultural Arts and activities of local tour sites.

Picture 29 Lump Literate Road Connecting Between Villages at Banglen District

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Picture 30 Traveling Route to Wat Lumpaya Floating Market, Important Tour Site of Banglen District

7.1. Wat Lumpaya Floating Market is the community civilization of people at Ta Chin Riverside where there are 2 special activities in boat sightseeing, rafting along the river as being told in Thai poem “Soonthorn Poo” and Sacred Buddha “Luang Por Monkol Malanimitr” which is the old Buddhist ancient temple for more than 100 years with handicraft such as rice, agricultural products, traditional herbal message and local museum.

7.2. Fish Sanctuary Wat Sook Wattanaram, Bang Rakum district

7.3 Fish Sanctuary Wat Bang Pla, Bang Na district

7.4 Dynasty Golf Club, Pai HuChang district

7.5 Marina Golf Course, Bang Luang district

7.6 Ta Chin River, Klong Narapimool, Bang Pasee, Klong Nokkatung, tour sites , ancient monument, ancient object

7.7. Ancient monument, Ayutthaya Square Structure with a spire, Wat Bang Pla , Bang Pla district

7.8 Kantaraj Buddha Image, Chieng San Era, Wat Kasaem Suriyum Naj Tumbol, Banglen district

7.9. Wat Uttayan Karnsuksa, Pai Hu Chang, Pai Hu Chang district

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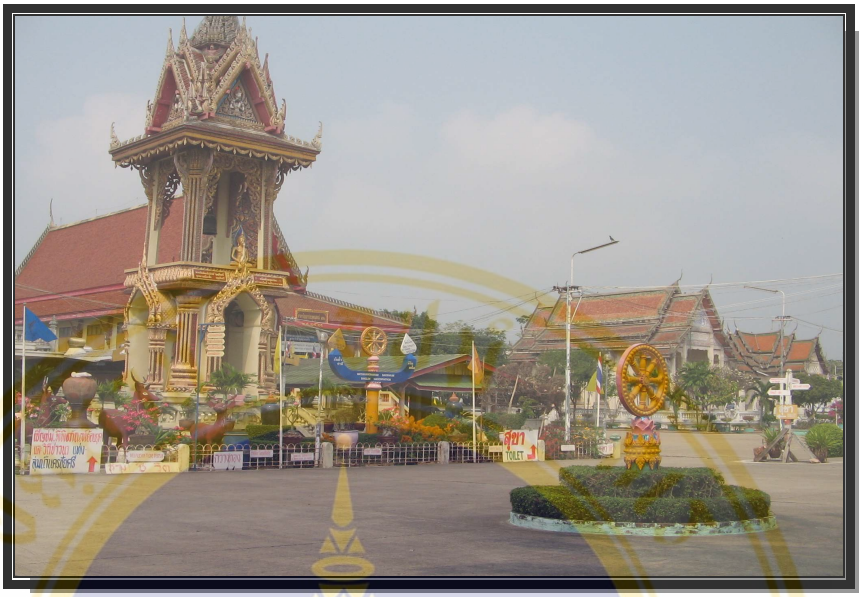

Picture 31 Tour Site at Wat Sook Wattanaram in Banglen District, Nakhon Pathom district

8) Cultural Tradition: at Banglen district Nakhon Pathom province, the following 3 cultures are prominent:

Thai Song: Thai Song Dum, Ban Kao Rat, Moo 8, Bang Pla district and Ban Pai Hu Chang

Thai Raman: Chinese Culture, Bang Pasee district, Ban Klong Cham Bang Pasee

Lighting Look Nu firework in Phra Mon Funeral

9) Environmental Perspective and Environmental Problems

Present environment of Banglen district in some part has created effect towards community from dust caused by trucks that carried sands and soils because some place has dug the pond for sand or sucked sand from the ground. As for obvious environmental problem is garbage, findings indicated that many garbage are found on the road and community, fresh foods market and Municipality area which create surrounding environment and destroy community landscape in the future. Another problem is waste water because farmers release waste water from rice paddy contaminated with chemical and pesticide into the rivers and canals effecting aquatic

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animals and poultry which caused extinction of living creatures. However, water in Ta Chin River at Banglen district and grow Chinese watercress for supplementary incomes.

Picture 32 Garbage dumping in the public area, Banglen district

5.6 Conclusion

Environmental surrounding us and everything surrounding us can be classified into 2 types such as natural environment and man-made environment or cultural environment. No matter how human defined or classified environment, they are own environment and everything is our environment depended which status we are in. No matter which status we are in, environment is crucial for our existence. If human fail to appreciate environment and constantly taking and destroying nature. Human lifespan would be shorter and unable to exist in such environment with happiness. On the contrary, if human appreciate environment, carefully use and maintain environment in good condition and being environmental-friendly. Human and environment would stay together always.

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UNIT 6
VARIOUS CONTENTS

6.1 Introduction

According to the National Education Act, (1999 B.E.), 8 academic groups is the basic administration and education management coincided with the Act of Kingdom of Thailand in Unit 4 of Article 22 for education management which stated that all learners can learn and develop self and regard learner as the most important object. Educational management process must encourage learners to develop their abilities naturally to their own potential. The National Act required the government to support education so that people can access education equally regardless of status. This is the government objective to educate all people in order to lead the country to prosperity

Picture 33 Learning Management in Bang Len District School, Nakhonpathom Province

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6.2 Basic Education Curriculum 2001 B.E. (2001 A.D.)

6.2.1 Principles

Basic Education Curriculum principles according to the nation policy are determined as follows:

1) It is the education for the country's unity, putting the emphasis on being Thai and International in the same time.

2) It is the education for people so that all people can receive education equally with society helping to arrange education.

3) Promoting learner for continuous self-development and self-learning by considering learner most valuable asset that can be developed naturally to full potential.

4) It is curriculum with structure flexible in contents, time and learning management.

5) It is the curriculum to manage all forms of education, cover all targeted group and able to transfer learning and experiences.

Picture 34 Environmental Education Activities at School

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6.2.2 Purposes of Basic Education Curriculum

Basic Education Curriculum is intended to develop the Thais for perfect human, being intelligent, happy and being Thai with potential to further study and to make living. Therefore, learning standards are set for learners to create desired characteristics as follows:

1) Recognize self-value and self-discipline based on the moral principle of Buddhism or own religion, having desired morals, ethics and values.

2) Being creative, eager to know and learn, love reading, writing and searching

3) Having world knowledge, aware of academic changes and progress with skill and potential in management, communication, technology, adapt to thinking process and suitable for situation.

4) Having skill and specific processes in mathematics, sciences, thinking, building intelligence and conducting life activities.

5) Enjoy exercising and caring for good health and personality.

6) Having ability to produce and consume efficiently with more value in being producer than consumer.

7) Understand Thai History, proud to be Thai, being good citizen, holding fast to lifestyles and democracy that has His Majesty the King as the country's ruler.

8) Having awareness for conservation in Thai language, art, culture, tradition, sports, local wisdom, natural resource and environmental development.

9) Love the country and community, aiming for making benefit and building good society.

6.2.3 Standard Structure of Academic Groups

To make education work according to learning goals and standard of Leaning institute and guidelines for practice, Basic Education Curriculum structure for class level is classified into 4 periods based on the development capacity of learner as follows: period 1 (Elementary 1-3), period 2 (Elementary 4-6), period 3 (Secondary 1-3) and period 4 (Secondary 4-6).

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6.2.4 Academic Groups

Curriculum learning is comprised of holistic knowledge, skill or learning process and values, morals, ethics of learner in 8 groups as follows:

1) Thai Language: Having vision in 4 areas for learner to possess skill in listening, speaking, reading, writing, thinking and analysis systematically with love in language art and carry on local wisdom language to raise Thai language to world class level.

1.1 Reading

1.2 Writing

1.3 Watching and Speech

1.4 Language application

2) Mathematics: Having vision in 6 areas for students to learn, know, understand mathematics by using skill process systematically with creativity, being responsible and able to apply with daily life happily and realize that mathematic is not that difficult.

2.1 Numbers and Operation

2.2 Measurement

2.3 Geometry

2.4 Algebra

2.5 Data analysis and feasibility

2.6 Skill/ mathematical process

3) Sciences**:** Having vision for Thai children to learn with science process, actual practice and able to apply with Thai lifestyles as well as developing sustainable teaching science in daily life activities from various learning sources. Developing Thai youth with actual science practice which can be applied with Thai sustainable lifestyles in 5 areas.

3.1 Physical environment and living arrangement

3.2 Life and Environment

3.3 Element and properties

3.4 Force and Movement

3.5 Energy

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4) Social Studies, Religion and Culture: Having vision in 5 areas to make learner being good person with righteous, proud to be Thai, update and remain in society happily.

4.1 Religion, morals, ethic

4.2 Civics, culture and social living

4.3 Economics

4.4 History

4.5 Geography

5) Art is consisted of 3 areas as follows:

5.1 Visual art

5.2 Music

5.3 Classical dance

6) Health and Physical Education included vision in 6 areas for learner to be healthy, in good spirit, be good.

6.1 Human growth and development

6.2 Life and family

6.3 Movement, exercises, games, Thai and international sports

6.4 Promoting good health, capacity and prevent sickness

6.5 Life safety

6.6 Art

7) Occupation and Technology included vision for developing work; idea with technology in 5 areas as follows:

7.1 Living arrangement and family

7.2 Work and occupation

7.3 Designing and Technology

7.4 Information Technology

7.5 Technology for work and occupation

8) Foreign Languages**:** Having vision in areas to develop learning for communication and search for information to maintain lifestyles in IT era .

8.1 Languages for Communication

8.2 Languages and Culture

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Picture35 Students Learning Output Through Environmental Education

6.2.5 Developing Learner Activities

They are activities to encourage learner to develop own capabilities aside from activities previously arranged for 8 academic groups and allow participation with others in suitable and interesting activities. The key development is to develop human holistic in physical, intellectual, emotion and social by making it another alternative to respond to the policy for building the nation youth with morals, ethics, order and quality and developing perfect human with self-conscious for doing good for society. Educational Institute must proceed with clear direction. Proper model and approach to develop learner's activities in 2 ways:

Guidance Activities are activities to support and encourage learner to discover own potential, building life skill, emotional quotient, learning in Multi disciplinary and building good relationship. All instructors must provide advice in life; extend education and self-development to professional world with the right occupation.

Students' activities are activities completely done by students from doing the study, analysis, planning, evaluating and improving work by putting the emphasis on group work such as Boy Scout, Girl Scout, and person rendering services.

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6.2.6 Learning Standard

Basic Education Curriculum determine learning standard based on 8 academic groups as the determinant for learner quality in knowledge, skill, moral principle, ethics and value of each group for developing learners to have 2 desired features as follows:

1) Learning standard in Basic Education Curriculum is the standard learning in each academic group that the learner must have when he had completed the Basic Education Curriculum.

2) Standard learning period is learning in each academic group. When learner complete learning in Elementary Level 3 and 6 and Secondary Level 3 and 6. Learning standard in Basic Education Curriculum had specified only standard learning requirement for developing qualified learners. The standard learning to coincide with community problem conditions and society, local wisdom, desired features for being good members of family, community, society and nation, including learning standard based on ability, skill and interest of learner, Education Institute can include itself.

6.2.7 Timeframe

Basic education curriculum determine different phase in learning management and developing learner activities as follows:

Phase 1: Elementary level 1.3 with average learning hour estimated yearly 800-1,000 hours, average daily 4.5 hours

Phase 2: Elementary level 4.6 with average learning hour estimated yearly 800-1,000 hours, average daily 4.5 hours

Phase 3: Secondary level 1-3 with estimated yearly 1,000 – 1,200, average daily 5-6 hours

Phase 4: Secondary level 4-6 with estimated yearly at least 1,200 hours, average daily 6 hours.

6.2.8 Curriculum Arrangement

Basic education curriculum is the curriculum that determine learning standard for developing learner from elementary level 1 to Secondary level 6. All

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learners in all targeted group can adapt with all type of education in formal and informal system based on one preference. For Education management for early age is being set up to develop and prepare learner readiness for entering Prathom 1. Structure for academic groups must specify time and learning standard after completing 12 years and learning in each period. Education institute must include this structure in the Educational Curriculum based on problems conditions, readiness, uniqueness, local wisdom and desired traits. Education Institute must be done for all subjects as specified. Furthermore, educational Institute can add more academic subjects as new subject with heavy concentration. Learner selects learning subject based on learner's skill, interest and need to match with learning nature and developing level. Compulsory education is arranged as yearly curriculum from Prathom 1 to Mattayom 3 and Mattayom 4 to Mattayom 6 in unit.

6.3 Conclusion

Arranging Basic Education Curriculum 2001 B.E (2001 A.D.) is important mechanism for developing learner to be intellectual with knowledge hat can be applied in occupation effectively, including ability and skill of learner, eager to learn but required learner's development in physical, mental, intellectual, knowledge and morals so that learner can be ready to make his living and serve the society further.

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UNIT 7
CONCLUSIONS

Environmental education is systematically transmitting environmental knowledge through education both formal and informal to achieve learning purposes of educational education, leading to sustainable environment. Environmental education integration with 8 academic groups is intended to develop teacher as designer of environmental education integration curriculum with various academic groups to apply acquired knowledge to school children so that students can achieve objectives of environmental education. It is crucial for basic education school teacher to have knowledge in many areas such as environmental education, integration, academic groups and environment as well as understand nature and contents of environmental education to become environmental educator and being able to transmit knowledge to learner effectively.

In order to develop basic education school teacher for true environmental educator, they must know and understand contents of other sciences in education and environmental education and able to integrate into one content. Knowledge and understanding in contents should help basic education school teacher becoming environmental educator and able to integrate environmental education with other academic groups effectively with no involvement of any principles or theories. Then, environmental education integrated with other sciences can be systematically and widely taught in the future. If learners, whether being teacher or student, understand science of environmental education, integrated environmental education for basic education school teacher should help learner achieve environmental education objectives, leading to sustainable environment.

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No.....

For ☐ **Teacher**

☐ **Student**

Questionnaire

Title

Integration of Environmental Education for Teachers in Basic Education Schools

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Directions

This questionnaire was constructed for collecting data in the research of "Integration of environmental education for teachers in basic education schools" The questionnaire composed of 6 parts as the following;

Part 1 Personal Information

Part 2 Questions Related to Community Environment

Part 3 Questions Related to Integration of Learning Management

Part 4 Questions Related to Learning of the Students

Part 5 Questions Related to Result of Environmental Education of The Students

Part 6 Problems and Recommendations

This data collected will be taken to analyze for completion of doctoral dissertation in environmental education program, Depart of education, Faculty of social sciences and humanities Mahidol University.

Thank you

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Directions: Part 1-3, please mark ✓ into ☐ before the sentence or fill in the blank.

Part 1 Personal Information

1.1 **Name**.....**Surname**.....

1.2 **Gender** ☐ Male ☐ Female

1.3 **Age**.....years old (If over 6 monthlys counting to be 1 year).

1.4 **Religion** ☐ 1. Buddhism ☐ 2. Christian
☐ 3. Islamic ☐ 4. Others (Specify……)

1.5 **The level of teaching**

☐ 1. Level 1 (Prathom 1-3) ☐ 3. Level 3 (Matthayom 1-3)

☐ 2. Level 2 (Prathom 4-6) ☐ 4. Level 4 (Matthayom 4-6)

1.6. **Academic Groups**

☐ 1. Thai Language ☐ 5. Art

☐ 2. Math ☐ 6. Healthy

☐ 3. Sciences ☐ 7. Working professional and Technology

☐ 4. Social Religion and Culture ☐ 8. Foreign Language

1.7. Amount of the teaching to response of the academic groups……year.

1.8. Amount of teaching……..year (if over 6 months, counting to be 1 yesr)

1.9. Education ☐1. Bachelor Degree ☐2.. Master Degree ☐3. Doctoral Degree

1.10. Monthly income in average…….baht.(counting of the other)

1.11 Marital Status ☐ 1. Single ☐ 2.Married ☐ 3.Others (Specify……)

1.12 The number of member in household…… persons.

1.13 Where is your schools setup district?

☐1. Sarmpharn ☐3.. Phutthamonthon

☐2.. Nakhonchaisri ☐4. Banglen

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Part 2 Questions Related to Environment in the schools and community

2.1 **Soil**

1) Classificationof soil in community.

☐ 1 Clay ☐ 3. Loose soil

☐ 2. Sandy soil ☐ 4. Others (Specify……..…)

2) Using of soil in community.

☐ 1. Agriculture ☐ 3. Industry

☐ 2. Resicence ☐ 4. Others (Specify……..…)

3) Problem of soil in community.

☐ 1. Alkaline soil ☐ 3. Acid soil

☐ 2. Highly acid soil ☐ 4. Others (Specify……..…

2.2 **Water**

1) Classification of water source in community.

☐ 1. River and Canal ☐ 3. Underground water

☐ 2. Tab water ☐ 4. Others (Specify……..…)

2) Using of water in community.

☐ 1. Agriculture ☐ 3. Industry

☐ 2. Resicence ☐ 4. Others (Specify……..…)

3) Problem of wate in community.

☐ 1. Inadequate ☐ 3. Overflow

☐ 2. Waste water ☐ 4. Others (Specify……..…)

2.3 **Air**

1) Air pollution problems in community.

☐ 1. Having problems ☐ 2. Not having problems

2) Classification of Air pollution problems in community.

☐ 1. Foul Odor ☐ 3. Dusty

☐ 2. Chemical mixtures ☐ 4. Others (Specify……..…)

3) Cause of air pollution in community.

☐ 1. Factory ☐ 3. Lump laterite road

☐ 2. Pesticides ☐ 4. Others (Specify……..…)

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2.4 **Energy**

1) Amount of money spending for energy in a month.

☐ 1. Fuel ☐ 3. Cooking gas

☐ 2. Electricity ☐ 4. Others (Specify……..…)

2) Problems related to energy.

☐ 1. Expensive ☐ 3. Less Amount of Energy

☐ 2. Difficult to finding ☐ 4. Others (Specify……..…)

2.5 **Plant**

1) Classification of economic plants in family.

☐ 1. Rice ☐ 3. Fruits

☐ 2 . Vegetables ☐ 4. Others (Specify……..…)

2) Vegetable in family.

☐ 1. Growing ☐ 2. No Plantation

3) Classification of vegetable garden (arranged in 3 priorities).

☐ 1. Chilli ☐ 6. Onoin ☐ 11. Ginger

☐ 2. Kaile ☐ 7. Galangal ☐ 12. Lettuce

☐ 3. Coccinia grandis ☐ 8. Basil ☐ 13. Lemongrass

☐ 4. Leucaena leucocephala ☐ 9. Kaffer ☐ 14. Others (Specify……)

☐ 5. Gourd ☐ 10. Cucumber

2.6 **Animal**

1) Classification of animal raising in family (arranged in 3 priorities).

☐ 1. Pig ☐ 3. Duck

☐ 2. Chicken ☐ 4. Others (Specify……)

2) Animal raising in family.

☐ 1. Yes ☐ 2 .No

3) Classification of animal raising in family (arranged in 3 priorities).

☐ 1. Pig ☐ 3. Cow ☐ 5. Fish

☐ 2. Chicken ☐ 4. Duck ☐ 6. Others (Specify……)

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2.8 **Concept Culture**

1) The relationship between human and environment.

☐ 1. Human was a partial of environment

☐ 2. Human have to construct the technology for controlling the environment

☐ 3. Everything in the world was not last long

☐ 4. The only God was a world king

☐ 5. Others (Specify……..…)

2) The decision making in the way of life.

☐ 1. Based on yourself

☐ 2. Based on the expert consulting before decide

☐ 3. Based on the mostly member in family

☐ 4. Based on the consideration of own benefit

☐ 5. Based on existing situation

☐ 6. Not interesting to decide

2.9 **Organization Culture**

1) The approach to solve the quarrel problem in family.

☐ 1. To give up

☐ 2. Reconciled by parents

☐ 3. Reconciled by older relative

☐ 4. According to law

☐ 5. Others (Specify……..…)

2) The approach to solve the quarrel problem in community.

☐ 1. To give up

☐ 2. Reconciled by the older in community

☐ 3. Reconciled by the leader in community

☐ 4. According to law ☐ 5. Others (Specify……)

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2.10 **Organization Culture**

1) The approach to solve the quarrel problem in family.

☐ 1. To give up

☐ 2. Reconciled by parents

☐ 3. Reconciled by older relative

☐ 4. According to law

☐ 5. Others (Specify……..…)

2) The approach to solve the quarrel problem in community.

☐ 1. To give up

☐ 2. Reconciled by the older in community

☐ 3. Reconciled by the leader in community

☐ 4. According to law ☐ 5. Others (Specify……..

2.11 **Usage or Behavior Culture**

1) The most of the spending in family.

☐ 1. Residence sush as renting, the installment of house

☐ 2. Food

☐ 3. garments

☐4. Education

☐ 5. The facilities sush as mobile phone, computer, the installment of car

☐ 6. Others (Specify……..…)

2) Saving.

☐ 1. Bank ☐ 3. Bond

☐ 2. Cooperative ☐ 4. Others (Specify……..…)

2.11 **Object Culture**

1) Classification of the residence.

☐ 1. Detached house ☐ 3. Townhouse

☐ 2. Bussiness building ☐ 4. Others (Specify……..…)

2) Form of the ownership of residence.

☐ 1. Own ☐ 4. Rent

☐ 2. Welfare ☐ 5. Others (Specify……..…)

☐ 3. Relative

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3) Number of the facilities in household.

☐ 1. Car…….....item. ☐ 6. VCD/DVD player…….item.

☐ 2. Motorcycle…… item. ☐ 7. Refrigerator……...item.

☐ 3. Bicycle…… …item. ☐ 8. Washing machine…… .....item.

☐ 4. Television… …item. ☐ 9. Microwave oven……..……item.

☐ 5. Stereo…… ..item. ☐ 10. Others (Specify…… ……..…).

Part 3 Questions Related to Integration of learning management

3.1 Student

1) The characteristic of the students in the schools

☐ 1. Responsibility ☐ 3. Relationship

☐ 2. Having the knowledge of learning ☐ 4. All

2) The problems of the learning integration

☐ 1. The teacher was not the line of education

☐ 2. Lack of the suitable media

☐ 3. Not having the direction education service

☐ 4. The students did not have the participation to any activities

☐ 5. Nothing having problem

3.2 Curriculum

1) The ratio between using of the general curriculum and local curriculum

☐ 1. 100 : 0 ☐ 2 80 : 20 ☐ 5 others .....

☐ 3 90 : 10 ☐ 4. 70 : 30

2) The percentage of learning plan setting

☐ 1. 100 % ☐ 2. 50 % . ☐ 5. 0 %

☐ 3. 75 % ☐ 4. 25 %

3) The Learning management of integration environmental education with academic groups.

☐ 1. Yes (Name of academic groups…….☐ 2. No

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3.3 Activity of learning

1) The Most of learning activities in the schools.

☐1. The construction source of learning☐ 3. The activities promote of

☐2. Very technical camp gives with a student ☐ 4. Others.....

2) The learning activity like model, any at the student is satisfied most

☐1. 1 The construction a place learns with in the school .

☐2.. The camp academic with the student

☐3. The activity encourages academic

☐ 4..others .....

3) The problem activity learning management In the school

☐1. A teacher still don't see the importance of the activity

☐2.. The student hasn't the time activity

☐3. The course doesn't help to build the activity arrangement

☐4..can not use mass media has in doing activity

3.4 Media and Technology

1. The most of media and technology in the school.

☐ 1. Books ☐3. Audiovisual education ☐5. Natural media

☐ 2. Computer ☐ 4. Media

2. A problem about using mass media and the Technology in the school.

☐ 1. The teacher still don't give precedence in using mass media

☐ 2. The teacher can't the ability in mass media production

☐ 3. The school hasn't the budget in the arrangement buys mass media

☐ 4. Others (Specify ……)

3.5 Teacher

1) How many teachers in the school enough or not enough.

☐ 1.enough

☐ 2.not enough (Specify teacher amount that want to enhance……..)

2) The most of teacher in school use the method teaches

☐ 1. lecture ☐ 3. Self study

☐ 2. Group Conversation ☐ 4. The nature is media for teaching

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3) The teacher in the ideal

☐ 1. there is kind and take care the student always

☐ 2. Knowledge and virtue

☐ 3.The good man and friendly with the teacher and the student

☐ 4. Creative thinking , seek knowledge and activities support

4) The problems related of the teacher in school

☐ 1. The teacher is not enough ☐ 3. The teacher hasn't the experience

☐ 2. The teacher hasn't the qualification ☐ 4.The teacher hasn't inspiration

☐ 5. Others (specify.....)

3.6 The process of learning

1) The strategy of learning in the school

☐ 1. Learning child center ☐ 4. Medias and Technology

☐ 2. Curriculum ☐ 5. Teacher

☐ 3. Activities ☐ 6. Integration Learning

2) The process integration of learning in the school

☐1.fix the substance correspond subjective explanation

☐2.fix the purpose correspond the school-record knows the expectancy

☐3.study course document before planning

☐ 4.It hasn't the specification or any plan

3) The problem about something integration manages to learn

☐ 1. Too the student

☐ 2. The student hasn't the interest seeks knowledge

☐ 3. Too the contents of Learning

☐ 4. Too less hour of learning management

☐ 5. Others (specify…….)

3.7 Evaluation

1) The most evaluation of the student learning in school

☐ 1. Choose ☐ 3. Qualitative

☐ 2. Collection file ☐ 4. Behavior record

☐ 5. Others (specify….) ☐ 6. Unknown

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2) The Used learning assessment of a student in school

☐ 1. The adjust method of learning management

☐ 2. The qualitative identity of Education

☐ 3. The qualitative identity of the school

☐ 4. Learning evaluation of curriculum

☐ 5. Unknown

3) The problem evaluation to learn of the student in school

☐ 1. The teacher hasn't knowledge, hasn't understand in the evaluation

☐ 2. The teacher hasn't skill in the evaluation

☐ 3. The student hasn't participation in the evaluation

☐ 4. The teacher hasn't attitude in the evaluation of the student

☐ 5. No problems

Direction: Part 4-5, please mark ✓ into the blank of learning level.Part 4 Please mark ✓ into the blank of learning level as the follow;

5 mean most 2 mean little

4 mean very 1 mean least

3 mean moderate

Question	Levels of Learning				
	5	4	3	2	1
1. Cognitive Domain					
1.1 Can answer questions the thing that can learn correctly					
1.2 Can explain the thing that can learn reasonability					
1.3 Can applied the thing has that to learn go to use in the every day life appropriately					
1.4 Can analysis the thing that can learn related and in order					
1.5 Can integration has that to learn to about same					
1.6 Can diagnose the thing that can learn have the standard					
2. Affective Domain					
2.1 Acknowledge to learn					
2.2 Take an interest seek knowledge to learn					

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Question	Levels of Learning				
	5	4	3	2	1
2.3 See the advantage and the worth of the thing to learn					
2.4 Systematize the thing that can learn appropriately					
2.5 Can lead the thing that learn to until practice habitually					
3. Psychomotor					
3.1 Can follow the thing that can learn correctly					
3.2 Can lead the thing that learn to go to can minister with oneself					
3.3 Can develop the thing has that to learn and minister with oneself skill					

Part 5 Question Related to Learning on Environmental Education

Question	Levels of Learning				
	5	4	3	2	1
1. Awareness 1.1 Agree that human was a partial of environment. 1.2 Agree that the quality environment affect to life quality. 1.3 Agree that human has not existed if without environment but the environment has existed while without human.					
2. Knowledge 2.1 Be Knowledge , the understanding increases related natural environment 2.2 Be Knowledge , the understanding increases related environment cultural 2.3 Be Knowledge , the understanding increases related natural pollution					

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Question	Levels of Learning				
	5	4	3	2	1
3. Attitude 3.1 The quality environment affect to physical health. 3.2 The quality environment affect to mental health. 3.3 The quality environment affect to overall of life quality.					
4. Skill 4.1. can analysis environment problem has with oneself 4.2 can solve the environment has with oneself 4.3 can conserve and develop the environment in the school and the community					
5. Participation 5.1 There was the participation for analyzed of environment problems 5.2 There was the participation for solution about environment problems 5.3 There was the Participation for environment develop of schools and communities					
6. Ability on Evaluation 6.1 If people in community burns the waste more, in the future will be occurred the global warming more. 6.2 If human has not stopped to destroy the forest, the world will be occurred disaster. 6.3 The using of pesticide in agricultural occupation can affect to living of plants, animals, and healthy people.					

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Part 6 Problems and Recommendations

Please specify of problems or recommendations related to environment of schools and communities learning management and learning of the student; arranged in 3 priorities.

6.1……

6.2……

6.3……

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BIOGRAPHY

NAME	Mr. Seree Woraphong
DATE OF BIRTH	May 10, 1965
PLACE OF BIRTH	Ratchaburi Province, Thailand
INSTITUTION ATTENDED	Petchburiwitayalongkorn Teacher College, 1989-1992 Bachelor Degree of Art (General Management) Mahidol University, 1994-1996 The Degree of Master of Education (Environmental Education) Thammasat University, 2000-2003 The Degree of Master of Labour and Welfare Development Mahidol University, 2003-2008 Ed.D. in Environmental Education
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