Chapter 1

Introduction

1.1 Background and Rationale

The development of science curriculum emphasizing on the development of the problem-solving thinking skill enabled the students to practice and apply what they had learnt in a classroom to benefit the outside world (Lyubomirsky, 1995: 176-178; Simpson, 2002: 1-5) by integrating among science, technology, society and environment in order to understand the problem and the effect on the environment and society occurring in our daily life and seek for a proper way to tackle them. The students should be aware of their responsibility and uphold morals and ethics involved with the development of the good environment and society. (Aikenhead, 1988: 8; Kim and Roth, 2008: 516-517; Yoruk et al., 2009: 69) The science curriculum emphasized the development of the student's ability to solve the problem, know how to use the proper technology, have a life skill and an awareness of the environmental development and conservation, have a service mind to work for the benefits of society and live with others happily in the society (Ministry of Education; 2004: 5), especially, the students in grade 12. They must possess the mentioned abilities which were beneficial not only to their studies but also to their work (Office of The Basic Education Commission, 2011:2)

As mentioned earlier, the researcher was award of the importance of the educational development in order to develop the science curriculum emphasizing on science, technology, society and environment learning approach (STSE-Approach) by using the learning activity with problem-solving model related to science, technology, society and environment learning approach (STSE-Problem-Solving Model) via the real practice both inside and outside the classroom led to the student's knowledge and skill development as well as the enhancement of the student's sense of responsibility. (Askenhead, 1998: 9). The aims of help the students be aware of the importance of

science and technology used in our daily life and support them to share ideas on the environment with their friends led to social responsibility.

The majority of people in Pong District, Phayao Province, earn their living in agricultural and livestock. Most of their agricultural crops are maize, rice and tobacco. The problems after the harvest are smoke and carbondioxide from burning and hydrogensulfide from rotten resides affected all living creatures. Besides, the feces flowing into the rivers when floured causes water pollution, harmful for both humans and animals. Another danger to nature was the abundant use of plastic in our daily life results in the plastic waste which is guide difficult to get ride of it properly. All these problems are the maim factors affecting the environment and the society. This becomes a challenging problem for the school and the society to solve. Thus, as a teacher and researcher, I want to develop the science curriculum for the enhancement to the student, problem-solving thinking skill and the sense of responsibility toward the environment and society. The students must be able to solve all problems with knowledge, understanding, reflective thinking, the use of scientific process and skill and learning through a real situation led to new knowledge. All learning activities will cultivate the student's sense of responsibility toward the environment and the society.

1.2 The objectives of research

1.2.1 To develop science curriculum emphasizing on science, technology, society and environment learning approach to promote the student's problem-solving thinking skill and sense of responsibility toward the environment and the society.

1.2.2 To study the results of the implementation of science curriculum emphasizing on science, technology, society and environment learning approach to promote the problem-solving thinking skill toward the environment and the society divided as follows;

1) Problem-solving thinking skill conforming to science, technology, society and environment.

2) Student's sense of responsibility toward the environment and society.

1.3 The scope of study

This research has determined a research population and a sample, involved variable, research contents and research duration.

1.3.1 Population and Sample

The target population used in this study was the twelfth grad, students studying in the second semester, academic year, 2012, at Pongpattanawittayakhom School, Pong District, Phayao, office of Basic Education Thirty-eight students were sampled by a cluster random sampling from three classes with the total number of 120 students.

1.3.2 The research variables

1) The independent variable was the science curriculum emphasizing on science, technology, society and environment learning approach to promote the student's problem-solving thinking skill and sense of responsibility toward the environment and the society.

2) The dependent variables

2.1) The student's problem-solving thinking skill

2.2) The student's sense of responsibility toward the environment and the society.

1.3.3 The research content

This study content was science curriculum emphasizing on science, technology, society and environment learning approach to promote student's problemsolving thinking skill and sense of responsibility toward the environment and the society. The content designed in the science curriculum was congruent with several subject matter such as Subject Matter 2; Life and Environment, Subject Matter 3; Substance and its properties, and Subject Matter 8; Nature of Science and Technology.

1.3.4 The research duration

The research process was carried out in the second semester, 2012 from October, 2012 to January 2013 with 30 teaching hours.

1.4 Definition of terms

1.4.1 The concepts of science, technology, society and environment means the learning approach which integrated among science, technology, society and

environment in a Supplementary Chemistry course at Pongpattanawittayakhom School, Pong District, Phayao Province. This course focuses on problem-solving thinking skill model conforming to science, technology, society and environment (STSE-Problem-Solving Model)

1.4.2 The development of science curriculum emphasizing on science, technology, society and environment learning approach means the development of a Supplementary Chemistry course for the twelfth-grade students at Pongpattanawittayakhom School. Its core contents including the fuel from fossils, petroleum products and the environment and the natural resources at local, national and global levels through learning approach conforming to science, technology, society and environment.

1.4.3 Problem-solving thinking skill means the students ability in searching for the cause of problem, the problem-solving proceeding, problem-solving reflection, problem-solving information presentation about the environment and the society by following STSE Problem-Solving Model; 1) searching, 2) solving 3) reflecting 4) creating 5) sharing and 6) acting. These skills can be evaluated by the use of assessment form emphasizing on science, technology, society and environment of the students.

1.4.4 The student's sense of responsibility toward the environment and the society means their awareness of taking responsibility toward the environment and the society which can be easily seen from 6 kinds of their behaviors as follows; 1) the awareness 2) the duty performance with volunteer 3) hard-working continuous working unit finishing 5) accepting all working fault. These behaviors contribute to the existence of society and can be assessed by using 1) Likert scale questionnaire 2) writing a journal using KWL-Search 3) Semi-structured interview.

1.5 The research expected outcome

1.5.1 Gaining the science curriculum and the guideline of science, technology. Society and environment learning approach to promote the student's problem-solving thinking skill and the sense of responsibility to the environment and the society. Teachers of other subjects can apply this guideline to their own subject. 1.5.2 Knowing how to evaluate the problem-solving thinking skill and the sense of responsibility toward the environment and the society by several methods such as rubric-scoring assessment, writing a journal using KWL-Searching and a semi-structured interview.

1.5.3 Learning about the environment-hidden problem through the belief in the signal power of the environmental conservations such as plant-growing activity on public holidays and score-motivated activity. However, these are still environment problems. Thus, some points from this research can applied to educate people to take responsibility toward the environment and look for the proper solution to tackle through different projects and sectors such as school, community, village leaders, local expert, etc.

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