### **CHAPTER 1**

### Introduction

#### **1.1 Historical Background**

Reading was a skill of perceiving accounts, knowledge, and experiences in order to convey thoughts. Qualified thoughts were naturally derived from procedural thinking, i.e. thinkers had to possess thinking skills or thinking procedures. Teachers were able to practice the thinking skills, namely translation, interpretation, questioning, paraphrasing, and conclusion. On the other hand, the writing was a skill of expressing knowledge, attitudes, and experiences by organizing thoughts obtained from the accounts, knowledge, and experiences which were gained from the translation, interpretation, questioning, paraphrasing, and conclusion. After that, the thoughts were transferred by descriptive writing, expanding explanation, and knowledge application. Therefore, reading, analytical thinking, and writing were constantly associated (Department of Curriculum and Instruction Development: 2003). The National Education Act of B.E. 2542 (1999) indicated that the instruction was delivered in a student-centered approach. Learners were able to learn from authentic experience and practical work to complete mastery. Also, they were enhanced to think critically, perform practically, solve problems efficiently, and acquire the reading habit in line with the each learner's aptitude. Educational institutions cooperated with guardians and communities so that they could participate in managing education. In terms of assessing learners' quality, the consideration was based on learners' improvement, behavior, activity participation, learning behavior observation, and testing during the instruction (Office of the National Education Commission: 1999). As a result, the Basic Education Curriculum B.E. 2551 (2008) was adjusted to be in line with the National Education Act of B.E. 2542 (1999) in that the instruction was managed in order to develop learners' reading, critical thinking, and writing although this had been delivered depending on learning areas in order to develop learners' aptitudes in reading textbooks,

documents, and other media. The learners then took the content they read to think critically and convey their thoughts by writing in precise language styles. This was in line with the concepts of Suwimon Wongwanich (2003) and Sirichai Kanjanawasee (2003) who mentioned that instruction and assessment had to cover three aspects which were knowledge and skills, learners' improvement, and virtue. Teachers were considered an important element in managing the student-centered instruction in that they acted as advisors instructing learners to generate their own knowledge body via practice. The Bureau of Academic Affairs and Educational Standards determined instructional guidelines, including an assessment on reading, critical thinking, and writing. The important procedure consisted of (1) committee member appointment, (2) indicator determination on instructional activities and assessment, (3) plan and assessment method determination, (4) determination of instructional activity management guidelines and assessment that was in line with scopes and indicators in managing instructional activities and assessment, (5) assessment and modification performance, and (6) conclusion and assessment outcome record for those relevant.

However, according to the research report of the Program for International Student Assessment (PISA) carried out by the Institute for the Promotion of Teaching Science and Technology (2014), it revealed that 44.6 percent of 15-year-old Thai students in 2009 performed at the basic reading Level 1 and below Level 1. (Level 1 was considered the lowest reading level, which indicated that students were able to recognize the main theme in a text, but they could make simple connections between information in the text and common, everyday knowledge at the low level. They could not make a reference or comparison for further analytical thinking skills.) When compared with the assessment results based on affiliations, it showed that the students of the Office of the Basic Education ranked the lowest in that two out of three students possessed the average at Level 1. Also, in terms of the proficiency levels in mathematics and science, the average scores were successively lower than the international average level since the assessment in 2000 onwards. (PISA assessed once in three years in three areas which were reading, mathematics, and science. It emphasized on reading for main ideas, thinking critically, and writing naturally in each subject. The evaluation results influenced economic growth of particular countries as manpower in current economy required high skill labor in that the educational achievement scores gained from PISA tests were employed as decisive

tools.) In 2012, however, the overall evaluation results in science and reading tended to be higher when compared with those in 2009. Reading average score was 441 while that of the international average score was 496. Science average score was 444 while that of international average one was 501. According to these scores, it revealed that the quality was at Level 2 which referred to the fact that students began to realize and benefit. However, there was an important issue identified in Thai educational systems in that the students in the high and the low groups in science and mathematics subjects possessed the lowest evaluation results according to the evaluation results done by PISA in 2012. In addition, the research findings expressed that reading skills related to mathematics and science subjects. In terms of factors influencing higher evaluation results, it was found that the instructional management, focusing on thinking, knowledge application in real lives, teachers' teaching preparation, and frequency in evaluating students were the main key.

In addition, it was found that qualified learning resources, such as textbooks, teacher manual, and supplementary books, were the factors influencing higher evaluation results as well. When studying problem causes, it revealed that teachers' teaching processes emphasized more on lecturing than managing knowledge and enhancing students' knowledge. Teachers lacked evaluation manual; teacher evaluating tools were not potential. In terms of self-evaluation tool preparation in all aspects, the lack of evaluation skills without details was spotted. As for students, most of them did not possess love reading habit of learning. They were also not familiar with subjective tests with long answers. They lacked basic skills necessary for their occupation which were critical thinking and problem solving (The Institute for the Promotion of Teaching Science and Technology (IPST): 2014). According to the research report, there were solutions proposed, such as modifying instruction curriculum and evaluation measurement of students to be accordance with those of international evaluation in every level, and revising the time period for classes. Administrators constructed atmosphere that motivated learning in schools and applied the evaluation results into planning for developing educational quality. Administrators, guardians, and communities, for example, cooperated in managing instruction and evaluation measurement so that students could think critically and solve problems.

Suwimol Wongwanit explored the evaluation result reports of evaluated countries in primary order in a science subject from PISA evaluation in 2009. As in Finland, for example, it was found that the quality evaluation focused on authentic outcomes produced by students not on tests, especially multiple-choice tests, as they did not generate answers by themselves. Good learning had to focus on answer generation on their own; teachers needed to target at students' productions provided during their study. Finland ended the national tests, but still allowed students to form productions and projects. The students needed to achieve their work chosen and brought that work to be evidence as their learning clues. Every student had to pass the evaluation as determined by curriculum criteria targeting at learning methods, thinking methods, and operation methods (Kovit Pawalpruek: 1998). As for the student productions, they had to be based on their authentic practice of reading, critical thinking, and writing that was in accordance with the concepts of Praphan Susaorat (2008) who mentioned that the ability of critical thinking was the foundation of problem-solving, thinking and creative thinking which needed basic skill in gathering data, especially reading skills, along with data analysis from what read and systematic thinking transferred by writing. Therefore, the key of reading, critical thinking, and writing lied on systematic thinking skills. After that, the researcher explored documents on instruction management guidelines and evaluation on reading, critical thinking, and writing of the Bureau of Academic Affairs and Educational Standards and noticed that instructional management and evaluation processes were not transparent. Moreover, the indicators in delivering instructional activities and evaluation on reading, critical thinking, and writing determined by the Bureau of Academic Affairs and Educational Standards were not informative. As for the development of human intelligence based on Skinner's concept, according to foreign research of Billy Mc Chain and Ruth Jarman (2010) who conducted research on knowledge, skill, and attitude construction and critical reading from scientific news of secondary level students, it was found that there were five aspects of the basis of critical reading development which were scientific knowledge, writing and language knowledge, news-newspaper-journal knowledge, reading-critical thinking-writing skills, and attitudes toward science subject. These were indicators stating that learners had to possess knowledge of content, skills, and attitudes. They were also able to convey from what they read. All of these factors were related and connected.

When exploring the countries whose scores were higher than those of international average based on PISA evaluation results, for example Japan, it was found that there was a morning reading session of students in educational institutions. This was practiced at that of PISA-style reading comprehension. Libraries were promoted to be searching sources for knowledge in schools. As for Thailand, the department dealing with evaluation i.e. the National Institute of Educational Testing Service (NIETS) - an independent regulatory agency – whose missions dealt with evaluating learners' quality on the basis of national curricular in reading and critical thinking via multiple-choice tests. These tests could evaluate reading and critical thinking, but writing. Moreover, O-NET tests, for example, could not measure students' abilities in many aspects, such as critical thinking, problem solving, etc. As for the Office of the Basic Education Commission, a state agency, whose duty was to manage education at the basic education level, also provided subjective-standardized tests on reading, critical thinking, and writing from determined situations in an essay or article format for junior high school students and story writing from pictures for early primary students. NIETS evaluated students affiliated throughout Thailand beginning in Academic Years 2010-2011. Later from Academic Year 2012 to the present, NIETS adjusted the evaluation format based on PISA testing guidelines by containing more multiple-choice and writing tests. Furthermore, there were some researchers who developed aptitude tests on reading, critical thinking, and writing, such as Rumphoo Pattawan (2005) and Noppamart Poomchawee (2007) who developed aptitude tests on reading, critical thinking, and writing focusing on vocabulary reading and reading for main ideas in Thai subject, Ananda Santhitiwanit (2008) who developed aptitude measuring tests in reading, critical thinking, and writing to convey messages for Grade 9 students via separate measurement between reading, critical thinking, and writing, and Supaporn Jandokmai (2010) who developed measuring test on higher order thinking skills based on determined situations for junior high school students. In addition, Phatcharawalai Meesap (2011) conducted research on thinking structures of primary students and found that analytical thinking consisted of importance analysis, relationship analysis, and concept analysis. It also revealed that analytical thinking influenced critical thinking. This group of research influenced students' learning achievement which was in accordance with the National Institute of Educational Test Service (2010) in that the factor influencing students' learning achievement of Grade 3 students was abilities in reading and critical thinking skills of students.

According to the study on both domestic and foreign research, including successful countries, it was found that foreign evaluation focused more on student quality evaluation i.e. students' successful performance during their study as learning evidence. The cocurriculum activities which were in accordance with PISA evaluation were held. In addition, there was research conducted on success factors in critical reading consisting of knowledge, skills, and attitudes toward reading in particular subjects. In Thailand, however, the evaluation was based on developing tools which were mostly multiplechoice tests. The evaluation content focused more on reading for main ideas from facts and opinions. The writing was conveyed but on a limited scale which still could not reach to the PISA evaluation content level focusing on students' reflection toward what they read and their real lives based on their knowledge and former experience, i.e. critical This tool development could not solve reading problems thoroughly as reading. determined in PISA evaluation and the Basic Education Curriculum B.E. 2551 aiming at students to possess critical thinking skills. In order to avoid confusion, the researcher employed the words "critical thinking" as appeared in the supplementary documents of the Basic Education Curriculum B.E. 2551. These words also appeared in the research on science teachers' needs and necessity in developing instructional management which enhanced the abilities in reading, critical thinking, and writing. Teachers needed and were necessary to develop instructional management, especially teaching methods and evaluation tool provision (Sunanta Rakpong: 2013). This obviously reflected that instructional management processes contained defects in knowledge and experience in developing students' reading, critical thinking, and writing at an individual level which was the teachers. Supaporn Thamwichaiphan (2007) mentioned that tool and material support, advice from those relevant, and the incentive which was teachers' needs and necessity were considered success factors for teachers so that they could operate successfully and willingly. According to these situations, it was definitely necessary to upgrade Thai students' reading quality by giving precedence toward teachers' instructional management. Teachers were supposed to focus more on reading, critical thinking, and writing which was in accordance with the National Education Act of B.E.

2542 in order to prepare for PISA evaluation concretely by generating strength in teachers' instructional management.

A concept that could generate strength for teachers and organizations on instructional management in reading, critical thinking, and writing was the concept of empowerment evaluation proposed by David Fetterman (1996). This concept was rooted from the evaluation process which was relied on the action research. It applied the concepts of technique evaluation and evaluation findings to empower teachers so that they adjusted and developed themselves. Later, it was developed to be a model of empowerment evaluation theory by David Fetterman (2005). It mentioned individual competency development in two aspects which were trainings that gave knowledge, consultation, and facilitation. As for Thailand, there was a lot of research conducted which was based on the empowerment evaluation in many aspects. One dealt with employing empowerment evaluation strategies which were (1) trainings to give knowledge, (2) consultation, and (3) facilitation in developing individuals and organizations. This group of research was conducted by, for example, Krittiya Wongkorm (2004) who applied this concept to develop teachers in learning evaluation at an organization level, Chonkorn Worain (2006) who applied this concept to develop the model of internal quality assurance within basic education schools, Sawatdichai Sripanomthanakarn (2007) who applied this concept to develop evaluation systems in basic education schools. Another dealt with using empowerment evaluation processes which consisted of (1) data collection, (2) goal determination, (3) strategy development, and (4) evidence provision to express an advancement in developing individuals and organizations. As at an individual level, the research was conducted by, for example, Sathida Sakulrattanakulchai (2010) who applied this concept to develop the instructional evaluation model in a studio type. As at an organization level, the research was conducted by, for example, Preecha Chantawee (2010) who applied this concept to mobilize research in schools. Another concept used, for example, dealt with educational evaluation concepts that Nevo (1983), Sirichai Kanjanawasee (2009), and Yaowadee Rangchaikul (2003) mentioned in that the evaluation was a reply used to determine an evaluation frame. They helped answer why the evaluation was done, what was evaluated, how was evaluated, what methods used to evaluate, who evaluated, and what criteria were used to judge the value. As for the researcher, the evaluation model for developing teachers' instructional management was

developed on the basis of the research conducted by Kritsana Kiddee (2005) who developed the evaluation model of instructional management which was considered student-centered instruction approach. This consisted of (1) evaluation goals, (2) evaluation-focused objects, and (3) evaluation methods and assessors' source judgement methods which were comprised of various evaluation forms done by themselves, teacher peers, students, program heads, director assistants, and guardians.

According to those aforementioned reasons, the researcher was interested in developing the evaluation model for developing science teachers' instructional management, which enhanced the abilities in reading, critical thinking, and writing of basic education students by applying the educational evaluation concepts of Nevo (1983), Sirichai Kanjanawasee (2009), and Yaowadee Rangchaikul (2003). These concepts focused on the evaluation aiming at information yield. The evaluation results used to judge the value of those evaluated were comprised of (1) evaluation objectives, (2) evaluation-focused objects, (3) evaluation operation, (4) evaluation result judgement, and (5) evaluation result report and utilization in developing instructional management. The development of instructional management based on the empowerment evaluation of Fetterman (2005) was also applied. This concept relied on the teamwork principle in developing science teachers so that they possessed their own willpower. It could be developed via two methods which were the training, giving knowledge, consultation, and facilitation until the science teachers could evaluate themselves and determine development directions of instructional management by themselves constantly. The research questions were as follows.

### 1.2 Research Questions

1.2.1 How were the learning management conditions of science teachers which enhanced abilities in reading, critical analyzing, and writing among basic education students implemented? Which aspects and levels science teachers possessed knowledge and understanding in learning management?

by Chiang Mai University

1.2.2 What were the characteristics of the proper evaluation model for developing science teachers' instructional management, which enhanced the abilities in reading, critical thinking, and writing of basic education students like? How qualified was the model?

1.2.3 What were the utilization results of the evaluation model for developing science teachers' instructional management, which enhanced the abilities in reading, critical thinking, and writing of basic education students like?

### **1.3 Research Objectives**

1.3.1 To explore instructional management conditions, knowledge and understanding in instructional management, and needs and necessity in developing science teachers' instructional management which enhanced the abilities in reading, critical thinking, and writing of basic education students.

1.3.2 To construct and identify the quality of the evaluation model for developing science teachers' instructional management which enhanced the abilities in reading, critical thinking, and writing of basic education students.

1.3.3 To identify the utilization results of the evaluation model for developing science teachers' instructional management which enhanced the abilities in reading, critical thinking, and writing of basic education students

### **1.4 Scope of the Study**

This research was considered the development of the evaluation model for developing science teachers' instructional management, which enhanced the abilities in reading, critical thinking, and writing of basic education students. The research scopes were illustrated as follows:

# **1.4.1 Content Scope**The content of the study was as follows:

(1) The conditions of instructional management operation, which enhanced the abilities in reading, critical thinking, and writing of basic education students in accordance with the Basic Education Core Curriculum B.E. 2551, were comprised of teaching preparation, instructional processes, and summary records, reports, storage, and learning outcome utilization.

(2) Science teachers' knowledge and understanding in instructional management, which enhanced the abilities in reading, critical thinking, and writing of basic education students in accordance with the Basic Education Core Curriculum B.E. 2551.

(3) Needs and necessity in developing science teachers' instructional management, which enhanced the abilities in reading, critical thinking, and writing of basic education students in accordance with the Basic Education Core Curriculum B.E. 2551.

(4) The evaluation model for developing science teachers' instructional management which enhanced the abilities in reading, critical thinking, and writing of basic education students was considered an ability evaluation of science teachers' instructional management which enhanced the abilities in reading, critical thinking, and writing of basic education students. This was in accordance with the Basic Education Core Curriculum B.E 2551. The evaluation results would be adopted to develop the science teachers' instructional management.

(5) The utilization results of the evaluation model for developing science teachers' instructional management which enhanced the abilities in reading, critical thinking, and writing of basic education students, which was in accordance with the Basic Education Curriculum B.E. 2551, were comprised of the evaluation results on the instructional management abilities in 29 indicators, attitudes toward the instructional management, and the evaluation of the model after being utilized.

## 1.4.2 Population Scope Chiang Mai University

The population employed in this research consisted of 4,661 science teachers in the educational institutions delivering from Grade 1 to Grade 9 affiliated with the Primary Educational Service Area, Phitsanulok, Areas 1, 2, and 3 (The Office of Policy and Planning, the Office of the Basic Education Commission: 2013). This service area was located in the provincial area and considered an education center of the lower northern region.

### 1.4.3 Time Scope

This research was conducted from 2013 to 2015.

### **1.5 Definitions of Terms**

**The evaluation model** referred to the evaluation guidelines in order to adopt the evaluation results to develop science teachers' instructional management which enhanced the abilities in reading, critical thinking, and writing of basic education students. This consisted of (1) evaluation objectives, (2) evaluation-focused objects, (3) evaluation operation, (4) evaluation result judgement, and (5) evaluation result report and utilization in developing instructional management.

The quality of the evaluation model referred to the value of the evaluation model for developing science teachers' instructional management which enhanced the abilities in reading, critical thinking, and writing based on the experts' viewpoints in the dimensions of (1) propriety, (2) feasibility, (3) clarity, and (4) utilization easiness and on the science teachers' viewpoints. This was evaluated as indicated in the following four evaluation standards.

(1) Utility standards referred to the fact that the evaluation model could comprehensively provide the data responding to the needs of the evaluation result users and those relevant which benefited knowledge and ability development in instructional management. The propriety of the time period in evaluating, developing result reports, and dissemination was set in a time period that could be utilized.

(2) Feasibility standards referred to the fact that the evaluation model could be practically employed in accordance with the contexts of knowledge and ability evaluation in instructional management. Also, the evaluation results were acceptable both at a policy level and at a practice level.

(3) Ethical propriety standards referred to the fact that the evaluation model could give confidence that the evaluation results were complete, fair, and acceptable among those relevant. This did not violate the rights of those evaluated. It was supposed to create cooperation in adopting the evaluation results for development.

(4) Accuracy standards referred to the fact that the evaluation model employed the techniques and methods that could yield the evaluation information correctly. The evaluation results were valid and reliable. Also, the evaluation result summary was performed reasonably.

**Instructional management** referred to teaching preparation, instructional processes, and summary records, reports, storage, and learning outcome utilization of science teachers which enhanced the abilities in reading, critical thinking, and writing of basic education students.

The abilities in reading, critical thinking, and writing referred to perception and cognition of media, publication, or electronic media based on learners' interest in each particular age. The learners would identify main ideas and concepts of what they read in order to utilize in new situations by grouping, categorizing, comparing, identifying relationship, linking data, selecting valuable data, writing summary, and reflecting the opinions logically by citing main concepts from what they read or experienced.

**Instructional management elements** referred to a group of variables indicating science teachers' knowledge and abilities. This reflected the possession of individual knowledge and abilities which were suitable in managing instruction, enhancing the abilities in reading, critical thinking, and writing of basic education students. These elements consisted of three aspects which were (1) teaching preparation, (2) instructional processes, and (3) summary records, reports, storage, and learning outcome utilization.

**Instructional management indicators** referred to the observed value or variables indicating science teachers' behaviors which reflected their skills and abilities in teaching preparation, instructional processes, and summary records, reports, storage, and learning outcome utilization in enhancing the abilities in reading, critical thinking, and writing of basic education students.

The abilities in instructional management referred to performance expression and performance results showing qualified abilities as determined in the criteria of science teachers in teaching preparation, instructional processes, summary and report records, and learning outcomes in order to enhance the abilities in reading, critical thinking, and writing of basic education students. This was gained from evaluating the science teachers before and after being developed based on the evaluation model in 29 indicators which

consisted of 16 indicators in teaching preparation, 9 indicators in instructional processes, and 4 indicators in summary records, reports, storage, and learning outcome utilization.

**Instructional management conditions** referred to science teachers' instructional management operation which enhanced the abilities in reading, critical thinking, and writing of basic education students. They consisted of three aspects which were (1) teaching preparation, (2) instructional processes, and (3) summary records, reports, storage, and learning outcome utilization.

**Knowledge and understanding in instructional management** referred to science teachers' concepts in managing instruction which enhanced the abilities in reading, critical thinking, and writing of basic education students in three aspects which were (1) teaching preparation, (2) instructional processes, and (3) summary records, reports, storage, and learning outcome utilization.

Needs and necessity in developing instructional management referred to necessity in developing the abilities in managing instruction of science teachers which enhanced the abilities in reading, critical thinking, and writing of basic education students in three aspects that were (1) teaching preparation, (2) instructional processes, and (3) summary records, reports, storage, and learning outcome utilization. This could be considered from differences between authentic conditions and likely conditions. The higher the difference value was, the greater the necessity was required.

Attitudes toward instructional management referred to positive feelings toward science teachers' instructional management which enhanced the abilities in reading, critical thinking, and writing of basic education students.

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### **1.6 Expected Benefits of the Study**

1.6.1 The information on instructional management conditions, demands, and necessities in developing science teachers' instructional management which enhanced the abilities in reading, critical thinking, and writing was gained. This information would be used in educational institutions and relevant departments so that they could plan their evaluation and development in order to develop science teachers based on their requirements and necessity.

1.6.2 The indicators in science teachers' instructional management which enhanced the abilities in reading, critical thinking, and writing in basic educational institutions were obtained. These indicators were distinctive in that they focused on teachers' instructional management which enhanced students to create knowledge body on their own via authentic practice from reading various media.

1.6.3 The qualified and effective evaluation model for developing instructional management of science teachers which enhanced the abilities in reading, critical thinking, and writing of basic education students was yielded. The model was distinctive in that it possessed participation from all relevant parties in evaluating the instructional management of the science teachers in order to adopt the evaluation results to develop the instructional management. This could be performed by reinforcing via training in order to give knowledge if necessary so that the knowledge foundation was adjusted. Evaluation during the instructional management was performed in order to adopt the evaluation results to develop the instructional management by reinforcing through consulting and facilitating the teachers so that they could evaluate themselves and reflect the results to their own until they could continuously manage instruction by themselves.

1.6.4 The results in employing the evaluation model for developing instructional management of science teachers which enhanced the abilities in reading, critical thinking, and writing of basic education students would help the teachers understand and be able to manage instruction focusing students' authentic practices from reading, critical thinking, and writing via various media in accordance with the Basic Education Curriculum B.E. 2551.