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An evaluation of teacher development in using technology during the first decade of Thai education reform 1999-2009

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AN EVALUATION OF TEACHER DEVELOPMENT IN USING TECHNOLOGY DURING THE FIRST DECADE OF THAI EDUCATION REFORM 1999–2009

by

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Dedication

To my aunt, Khun Ja, my mom, my dad,

and to Thai educators

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ABSTRACT

This study is a historical analysis of teacher development for using instructional technology in Thailand beginning with the early origins of educational reform efforts through the National Education Reform Act of B.E. 2542 (1999) and for one decade of its implementation (1999-2009). Data sources for this study included both primary and secondary sources. These sources were historical records, government documents, newspaper and magazine articles, and scholarly books and articles. They were analyzed to determine which policies, proposals, and plans related to teacher development in using instructional technology and which of them promoted a constructivist or student-centered teaching environment.

The findings indicated that many of the proposed reforms led to new instructional techniques that challenged the previous Thai education system, which had relied on a teacher-centered, top-down approach. Despite many government-sponsored teacher trainings, teachers were still uncomfortable with teaching in a student-centered environment.

This study also focused on Thai methods of teacher training and identified problems with the quality of training courses, with the methods of training, with the effectiveness of the courses teachers were taught, and with the assessment of the follow-up and evaluation provided after a given course or workshop. The evidence showed that teachers resisted many aspects of the new approach. This dissertation proposes ways to help teachers out of their reluctance and resistance to reforms using instructional technology.

This dissertation provides a number of recommendations to help Thai educators begin to use modern instructional technology. Among these are included a call for greater improvement of teacher education and the adoption of new concepts of teaching and learning to elevate the skill level of Thai teachers. Chief among these was treating Thai teachers as adult learners so that they would take responsibility for their development according to their specific learning needs and teaching situation.

Thus, this dissertation provides a historical, methodological, and pedagogical approach to the issue of Thai teacher development in using instructional technology in a constructivist learning environment.

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Glossary of Abbreviations

ADB	Asian Development Bank
EC	Education Council
ICT	Information Communications and Technology
IPST	Institute for the Promotion of the Teaching of Science and Technology
LTEW	Learning Technology Empowerment Workshop
MOE	Ministry of Education
NEA	National Education Act
NEC	National Education Committee
NECTEC	National Electronics and Computer Technology Center
NIDTEP	National Institution for Development of Teachers, Faculty, Staff, and Educational Personnel
ONEC	Office of National Education Committee
NESDB	Office of the National Economic and Social Development Board
OEC	Office of the Education Council
TERO	Teacher Education Reform Office
ThaiLIS	Thai Library Integrated System

Chapter One: Background and Rationale

The purpose of this dissertation is to examine Thai policy proposals, principles, and practices concerning teacher professional development and training in relation to the use of instructional technology during a period of Thai education reform, especially from 1999 to 2009. It begins with a brief historical overview of how Thai education reform policy emerged, evolved, and was truncated, thus providing a rationale for the study. In addition, this chapter gives a statement of the purpose of the study, its research questions, its significance, and its limitations. In this manner chapter one provides a comprehensive introduction to the entire research project.

Since the introduction of the computer into education, the instructional technology challenges facing Thai teachers were clear. They needed to integrate technology tools to support instruction of their students and to teach students in a new learning environment more appropriate for the 21st century. This chapter demonstrates how in the 1990s and early 21st century, many Thai teachers, administrators, and ordinary citizens grew to acknowledge and understand the importance of updating their education system to include technology resources and processes that were changing education worldwide.

The need to update and modernize was clear. As citizens not only of the country but also of the world, Thai students, like students everywhere, needed to be taught how to compete in a knowledge-based society where digital information is shared globally and rapidly, and where economic growth would yield the best results through the acquisition

of modern technological techniques, knowledge and learning skills. Nowhere was this imperative greater than in teaching Thai students all that they could learn about how to use instructional technology skills that they could acquire through the classroom as well as through self-directed and continuous lifelong learning. For this reason, Thai teacher training in the latest methods of instructional technology was the strongest line of defense against outdated modes of teaching and obsolete tools of learning. Without dedicated and trained teachers whose classroom equipment, pedagogy, knowledge and skills were completely up to date, the future ability of Thai students and of their country to compete successfully in both contemporary and future world markets would be a bleak one indeed.

This research aimed to deepen understanding of both the Thai reform process and point out the benefits and the limitations created by the early reform program entitled the National Education Act of B.E. 2542 (1999) (NEA). This study paid particular attention to Thai teacher development and training in using instructional technology in the classroom outlined in the NEA as well as pointed to the need for modernization in teaching styles and techniques through embracing the modern teaching methods.

As mandated by the NEA, the Thai government in the following decade rushed to make a number of education policy changes and investments such as the institutional construction, legal framework, and technological infrastructure. This widespread investment included new classroom hardware and software and attempted to update teacher training and development in using instructional technology and in incorporating new pedagogies in the classroom.

This new zeal for education reform can be seen in the government's financial support for new courses and trainings. Atagi (2011) and the Office of the Education Council (2004a) stated that the money the Thai government had invested for education was the largest share of total public expenditures in 1997. They also found that in 1998, the share for educational budget was 25.2 percent of the public expenditure. In 2000, the size of education budget was 25.7 percent. The national budget for the educational sector had remained above 20 percent of the public expenditure from 1997–2009. To illustrate, Table 1 depicts the educational budget per GDP and the national budget below.

Table 1. *Educational budget per GDP and National budget during the fiscal year 1999–2009*

Fiscical year	GDP	National budget (N.B.)	Education budget (E.B.)	E.B./GDP	E.B./N.B
1999	4,637,079	825,000	207,316.5	4.47	25.13
2000	4,922,731	860,000	220,620.8	4.48	25.65
2001	5,133,502	910,000	221,591.5	4.32	24.35
2002	5,450,643	1,023,000	222,989.8	4.09	21.8
2003	5,917,369	999,900	235,444.4	3.98	23.55
2004	6,489,476	1,163,500	251,194	3.87	21.59
2005	7,092,893	1,250,000	262,721.8	3.7	21.02
2006	7,844,939	1,360,000	295,622.8	3.77	21.74
2007	8,525,197	1,566,200	355,241.1	4.17	22.68
2008	9,080,466	1,660,000	364,634.2	4.02	21.97
2009	9,041,551	1,951,700	419,233.2	4.64	21.48

Source: Bureau of the Budget

However, the lack of a return on this investment in Thai education was noted in several reports. These reports also noted that the quality of Thai education and educational ranking was below par ("Education reforms must," 2007; Fry & Bi, 2013;

Thailand, 2007; ONEC, 2001a; ONEC 2001b; Pongwat & Rupavijetra, 2011; Thaipublica, 2012).

Another gauge of the early situation requiring Thai education reform can be seen in several rankings of Thai education in comparison with other nations in the world. In the early 2000s, several reports were published that ranked the Thai education system as performing poorly in relation to other countries (Fry, 2002; ONEC, 2001a; Thailand, 2007). In responding to these reports, there were several initiatives for educational reform. These efforts resulted in the NEA of 1999. The first amendment of the NEA in 1999 (ONEC, 1999a) expressed confidence that the urgent implementation of education reform could prevent the Thai education system from getting worse at a time when it needed to become so much better. Without this major reform of their education system, the quality of Thai teachers and students would have gained very little in competing with other countries in the age of globalization. Without such improvements, the Thai educational system would have continued to lag behind the benchmarks set by other countries, and Thai students would have fallen behind in the rapid development of information and communications technology (ICT) skills that were demanded by the modern professional workplace throughout the country and the world.

To understand why Thai reform was positive and yet still fell short of accomplishing its goals, this study uses the historical research method to understand the past issues, in particular the role of tradition and culture in the Thai education system. Analyzing the history of Thai education reform was a foundation for projecting the options available for future policy and practice in the use of instructional technology in

the classroom. It also revealed how closely connected were the past efforts at reform to future problems and needs for education policy revision and updates.

In addition to historical analysis of Thai education, this introduction discusses internal and external causes of Thai reform. The needs to improve its quality of people and the stability of the country were equally as important as the ability to be a leader in the region.

Causes of Thai Education Reform and Its Importance for the Future of Instructional Technology in the Classroom

Before examining the history of Thai education reform, it is important to give the status and the economic and political context out of which the impetus for the NEA reform emerged. Prior to the implementation of the NEA in late 1999, there were several incidents that caused Thai people to question the quality of Thai, the need for new knowledge, and the improvements in instructional technology in neighboring countries. An important factor contributing to this questioning was political instability in the country.

Political instability.

One of the ministry of education's difficulties in maintaining quality has been the frequent changes of government and cabinet. It is a tradition of Thai politics that when the government changes, ministers and chairs are changed as well. Despite being the same government, each minister who replaces the previous minister makes new projects,

programs, and discontinues former plans. Ketudat, a former minister of education and an education reformer, commented on Thai politics that each minister had degrees of seriousness and sincerity in reforming the education system (2002). His remark can be proven by studying the changes in the MOE. There had been eight ministers and ten reshufflings of the MOE during 1974–1981 (ten changes during a seven-year period).

Thais repeated this history during the NEA. There were two new cabinets and 11 ministers during the ten years' period ("Profile," n.d.). Thaipublica (2014) analyzed the frequent changes in the MOE. The results showed that the MOE started changing its ministers often since 1995. And from 1995 to the time of this writing in 2014, there were 20 ministers in the past 20 years, or the average term for each minister was 0.95 years per person.

In addition, Thaipublica (2014) reported that every government had continued to support expanding compulsory education and the Educational Loan Fund during the past 20 years. The government also supported teacher development policy but not always as continuously. Whenever there were disruptions and shifts in the government, there were also shifts of focus in governmental support for teacher development that hindered progress in the education system.

The quality of education.

The 1997 Constitution of Thailand, enacted in October 1997, was called the People's Constitution. One of the key innovations compared to the previous Constitution was Chapter 3, section 43, "A person shall enjoy an equal right to receive the

fundamental education for the duration of not less than twelve years…" and Chapter 5, section 81, "The State shall provide…law relating to national education, improve education…support researches in various sciences, accelerate the development of science and technology… develop the teaching profession, and promote local knowledge and national arts and culture." These chapters paved the way for Thais to have the first education law (ONEC, 1999b; Sangnapaboworn, 2005). The MOE (2001) reported that the draft of education reform had begun in 1995. The Thai government formed a working group to synthesize education reform policies and pedagogical practices from other countries that had experience in researching and reforming their education systems; for example, attention was devoted to the United States of America, Japan, and China. This synthesis report became a model for the Thai National Education Act 1999 (NEA) (Fry, 1999; ONEC, 2002c; Wiratchai, 2002).

Just when an interest in education reform was emerging, national and international events made progress more difficult. In 1997, there was a financial crisis that affected Thailand and other Asian countries. At this time, many Thais realized that the education system failed to produce manpower that could keep up with the economic, financial, and technological changes in the world community. Thai educational ranking was weak when viewed in relation to other nations of the world. This weakness hampered the development of the nation, for without superior educational advantages, the Thai people would not be able to compete in the modern world markets. The Thai people were disappointed when they learned of the dire economic news about Thailand's impaired

educational system, and many media reports broadcasted the sad news to the people of the nation's decline in global rankings ("Education reforms must," 2007; ONEC, 2001a).

For example, two major reports: *The Ability of Thai Education Competitiveness 2001* and *The World Competitiveness Yearbook* identified the Thai education system as subpar. This low educational ranking as well as the poor quality of human resource development in Thailand led many Thai people to realize that their students and the nation were underperforming. In 1999, one response to this crisis was the Department of Curriculum and Instruction Development in the Ministry of Education that conducted a national quality assessment of education at the upper secondary level, equivalent to Grade 12 in the United States. This report stated that the performance of the Thai education system on all these levels was "unfavorable" as reported in *The World Data on Education*, 6th edition, 2006/07 (Thailand, 2007). Such reports brought many concerned Thais to the point of reexamining their education system.

Concerns about Thailand's low educational ranking caused many Thais to question its quality of education. Phasina Tangchuang (2010), a senior researcher at the Centre for Education and Labour Studies located in the Faculty of Education at Chiang Mai University, Thailand, questioned the credentials of Thais in higher education. Thais believed that the higher the diploma, the higher should be the compensation. Tangchuang surveyed mixed types of ten Thai universities, that is, old, new, public, and private. He found that there was competition in offering PhD degrees and in recruiting students. Public advertisement became common. As cited in Tangchuang (2010), Ronald Dore called this phenomenon *diploma disease*. Dore (1976) explained that the aims for

schooling had changed. People earned degrees to increase their incomes rather than for knowledge. Tangchang's study points out that Thai diplomas were inflated in educational value. Thais disregard the fact that the philosophy behind higher degrees, master's and doctoral, were meant to enable Thais to do exhaustive research and master a whole body of knowledge. Tangchang said that if Thais' concept of higher education was viewed only as serving personal economic interest, the consequences would have a negative domino effect. All Thai higher degrees would eventually be devalued. The teaching profession would be regarded with disrespect. As a consequence, Thais would not trust the quality of higher education.

Gerald W. Fry (2002) reported in his study the *Synthesis report: From crisis to opportunity: The challenges of education reform in Thailand* that the quality of Thai education at the beginning of the reform was positive based on the numbers and contradicted negative assessments mentioned earlier:

> Literacy rates are at an impressively high 95 percent rate and universal primary education has been basically achieved. Over 80 percent of all teachers have received a bachelor's degree or higher. At the Ministry of Education itself, there are over 400 individuals with doctorates. (p. 3)

Fry inferred that Thai education succeeded in quantity. On the other hand, a number of major issues related to teacher development were still waiting to be solved (Fry, 2002).

Need for new knowledge.

The Thai Ministry of Education (2001) reported at the 46th International Conference on Education that there were six major problems in Thai education before the reform. They were:

- Overcentralization;
- Lack of unity in educational administration;
- Lack of efficiency in quality assurance and desirable standards;
- Lack of public participation;
- Lack of systematic and continuous policy development; and
- Lack of coordination among the ministries with major responsibilities for education (Ministry of Education, Ministry of University Affairs, and the Office of the National Education Commission). (pp. 1-2)

In the same report, the Ministry of Education (MOE) identified five problems in Thai human resource development as follows.

1) Students needed new skills to be in a new globalization trend;
2) Long-term planning for human resource development was needed;
3) The investment in research and education was very low;
4) On average, Thai students spent seven years in school in 1998. There was a need for these students to spend a longer time in school to develop their skills; and
5) The need to improve administration and management to provide equal opportunity education to all citizens.

The NEA began with the desire to improve the quality of education and to enable the country to recover from its decline in global rankings. It was clear that there was an immediate need for reform if Thai society wanted to become more competitive in a future, knowledge-based and technology-informed society.

In the early 1990s, questions about the quality of human resources development were raised by both businesses and government agencies. Initially, it was the private banking sector that took action by reorganizing its whole business model to include information technology in an environment where technology had not yet made much of an impact. This business model that included information technology played an important role in the pre-education reform in Thailand. Sangnapaboworn (2005) reported that Mr. Bantoon Lumsum, the president of the Thai Farmers Bank – name recently changed to Kasikornbank – successfully reformed his organization to compete more effectively both domestically and internationally. He integrated information technology into his bank's operating system in 1993 as reported in *The Economist* (Ketudat, 2002; "Re-engineering in Thailand," 1997; Sangnapaboworn, 2005). Mr. Lumsum applied Western banking management techniques to his organization and many Thais took note of the benefits of modern banking operations that might be applied to education as well.

One of the changes was "the introduction of a unitary teller system – allowing one cashier to perform almost all the transactions a customer might want – required a much more fundamental overhaul of the bank's system" ("Re-engineering in Thailand," 1997, para. 10). To achieve this business model, the bank made an enormous investment in computer technology and training for its employees. Mr. Lumsum not only recognized

that information technology was the future for his own industry, his actions also showed his awareness of the need for information technology across society in general and for the future of Thai education in particular. In this limited but highly significant way, Thai citizens were first made aware of the widespread information technology needs of the nation (Ketudat, 2002).

Mr. Lumsum established a task force in 1994 to raise social awareness by forming a committee consisting of leading scholars such as a former minister of education and other high ranking leaders of Thai education organizations. The task force issued a series of books expressing a desirable reformation of society and proposing solutions to educational problems. Three examples were *The dream of the nation, The truth of the nation,* and *The proposal for education reform in Thailand*. Ketudat (2002) and Sangnapaboworn (2005) described how this campaign could succeed in building awareness for improving Thai education.

The impact of these documents was significant enough for the minister of education to launch an education reform project. According to Sangnapaboworn, education reform was needed in four areas, namely, curriculum, teachers, school, and administrative reform. Unfortunately, because of the instability of the government, lack of public participation, and a procurement scandal, the proposed reform project slowly disappeared after a reshuffling of the cabinet. However, Ketudat (2002) insisted that this campaign made a significant impact on the impetus for the National Education Act B.E. 2542 (1999).

An early effort at improving human resource development in general was made by the Office of the National Economic and Social Development Board (NESDB). One of the responsibilities of the NESDB was to formulate a five-year National Economic and Social Development plan. The first plan, initiated in 1961, continued the trend towards the improvement of the Thai education system. Prior to 1997, the Eighth National Economic and Social Development Plan (1997–2001), relied upon previous concepts of national economic and social development that had been based on existing ideas for Thailand to expand its economy. On the basis of such early proposals, the utilization of human development was recognized as necessary for future expanding economies. However, the utilization of human resources for an expanding economy did not include an emphasis on training in the use of instructional technology, a training goal that Thais needed for developing a 21st-century education program.

Although the NEA was central and foundational, it was not the only effort Thais made towards improving and modernizing its education. Even with a forward-thinking agenda laid out more elaborate in chapter two of this dissertation, it still seemed as if there was insufficient support to realize the three principles: (a) lifelong learning, (b) participation of government, business, and community in the provision of education, and (c) continuous student development both within and beyond the school (ONEC, 2002a). In the pursuit of these guidelines, the National Electronic and Computer Technology Center (NECTEC) – a science and technology development agency under the Ministry of Science and Technology – initiated the *SchoolNet* project. SchoolNet started in 1995 to introduce information technology to Thai classrooms, to enable users to benefit from

information that was available on the Internet, to promote self-education, and to narrow the gap between the haves and the have-nots in accessing information between schools in big cities and schools in remote areas (Kiattananan & Koanantakool, n.d.). However, the goals of SchoolNet were very limited.

During the early phase of SchoolNet, the use of the Internet for education was not widespread in the country. Schools did not have trained teachers, who knew how to use the Internet for teaching in classrooms. Moreover, online education was more difficult because most Web content was in English. In 1998, SchoolNet merged with the Golden Jubilee network – established in honor of the 50th anniversary of His Majesty the King of Thailand's ascension to the throne – and changed the project's name to *SchoolNet@1509*. This network provided access to an electronic library containing Thai content and information as well as royal projects initiated by those related to His Majesty the King of Thailand (Pansawat, 2003).

To expand the SchoolNet network, NECTEC eventually joined with the Telephone Organization of Thailand, the Communication Authority of Thailand, and major universities in the installation of phone lines and modems to develop online content in the Thai language. It included the hosting of a Thai digital library that was accessible online. Thajchayapong (2003) reported that through these efforts, 4,889 schools were connected to the Internet by the end of the project in 2003, when NECTEC handed SchoolNet over to the Ministry of Education (MOE). SchoolNet@1509 has continued at the time of this writing to provide Internet access for schools throughout Thailand.

Thais also made other initiatives in the area of introducing instructional technology into the education program. To stimulate the use of information technology in Thai schools, NECTEC joined Kasetsart University to initiate a digital library pilot project. This project was the very first attempt to make Thai-language content available for students and teachers online. The developers used the analogy of a library in which students and teachers were encouraged to do research by using the SchoolNet network. The project aimed to enhance the accessibility of information technology for Thai schools and minimized the gaps between schools that had Internet access and those that did not ("Thailand: SchoolNet digital," n.d.; "Digital library for," n.d.).

Another way that NECTEC tried to advance the utilization of multimedia and the SchoolNet@1509 network was by having a contest for creating digital contents for its digital library project ("Thailand: SchoolNet digital," n.d.). Participants were basic-education-level students (equivalent to K-12) from all over the country who created Thai-language content for the digital library. The project aimed to motivate and encourage students to work in groups. Students were expected to use instructional technology for studying, synthesizing, and creating their own learning content.

The enduring significance of the SchoolNet project was its emphasis on a constructivist learning model insofar as it used a student-centered approach. As shown later, constructivism was one of the most difficult aspects of education reform due to the traditional nature of Thai teaching as an authoritarian teacher-centered model.

Instructional technology projects in neighboring countries.

Thailand was not the only country in the region that foresaw the benefits of instructional technology for education. Malaysia and Singapore were two neighboring countries who introduced large instructional technology projects for educational development as well.

The government of Malaysia launched the Smart School project in 1997 ("Policy on ICT," n.d.). The project was one of the seven flagship applications of the Multimedia Super Corridor – a special economic zone (Cybercity) that aimed to attract information technology investors with tax incentives and hi-speed Internet access ("Locations", n.d.). The *Policy on ICT in Education Malaysia* reported that the Smart School project used the benefits of technology to enhance every aspect of education. These included the improvement of Malaysia's educational technology infrastructure, the introduction of computers, educational software, courseware, and teacher trainings. The project was divided into four phases: (a) the pilot (1999–2002) – implemented in 88 schools, (b) the post pilot (2003–2005) – based on learning from the pilot, (c) making all schools smart (2006–2010) – extending the digital transformation to all, and (d) consolidate and stabilize the project (2010–2020) – technology becoming an integral part of the nation's learning process.

In 2008, the Singapore Minister of Education delivered a speech at the International Conference on Teaching and Learning with Technology that there were three phrases of the "Masterplan for ICT in Education". The first Masterplan was implemented in 1997 and the first phase of their master plan was to lay the foundation by

preparing schools with infrastructure, hardware, software, curriculum, and training teachers with basic skills in integrating information technology into their lesson plans. The second Masterplan (2003–2008) strengthened the use of ICT in classrooms, for example, using Podcasts for making improvement on pronunciation. The ICT Standards for students, such as basic typing skills, were introduced in 2007. And the third Masterplan, announced in 2009, had four goals to: (a) strengthen competencies for self-directed learning, (b) tailor learning experiences according to the way that each student learn best, (c) encourage students to go deeper to advance their learning, and (d) learning to learn anywhere ("Speeches opening address," 2008).

Introducing the History of Educational Reform in Thailand

The first formal Thai education reform in a modern sense began in the late 19th century. The first public school was established during the reign of King Chulalongkorn (Rama V) (ONEC, 1999b). After that, the country went through rapid transformations in many areas, for example, politics, economics, and education. The country had changed from absolute monarchy to constitutional monarchy, from agricultural trading to an industrialized economy, and from studying with monks to putting students at the center of learning.

According to some scholars and research sources, there were three major periods of education reform in Thailand from 1868 to 1999 (ONEC, 1999b; Pongwat & Rupavijetra, 2011; Sangnapaboworn, 2005). However, some scholars (Fry, 2002; Ketudat, 2002) were unique in their recognition of the challenges the country faced due

to globalization. This study viewed the globalization and the influence of information technology being as another major period of the Thai education reform. Thai education reforms in this dissertation were categorized into three phrases (a) modernization period (1868–1990s), (b) first decade of Thai education reform (1999–2009), and (c) second decade of Thai education reform (2009–2018). However, only the first decade of Thai education reform (1999–2009) was studied. To provide historical importance, five major periods of education reforms, both official and unofficial, were mentioned in this dissertation. The focus of this dissertation was teacher development and using technology in the classroom as provided for the NEA (1999).

Modernized period (1868–1990s).

The first educational reform began during the reign of King Chulalongkorn (Rama V) (1868–1910). During his reign, Thailand and other countries in Southeast Asia were threatened and colonized by Western military powers. In order to promote Thailand's independence and to demonstrate modernization and civilization, King Rama V used modern education along with administrative and political reform to modernize the country by producing a new generation of leaders and administrators (ONEC, 1999b; Pongwat & Rupavijetra, 2011; Wyatt, 1969). One of the improvements was to reform the Thai education system. Another major improvement was transforming a religion-based temple system to a modern, secular school system. The first school in a modern sense – a school building and a timetable for scheduling classes – was founded during this reform period. Later in his reign, King Rama V founded an English school in the palace to

prepare princes and court children for studying abroad and for working in the government. In preparation for mass education, King Rama V extended public education and appointed committees to prescribe organization, textbooks, and standards for public schools had begun. The first examination of the students in Thailand was held on December 1879 (Wyatt, 1969). Thai education had proliferated beyond the court and temple system, which laid the foundation future reform.

The first Department of Education was founded in 1892 during his reign. This transition from a religious to a secular system of schools was the first major step that Thailand took that moved it slowly into the modern world of study and learning.

Thai education had continued to improve and develop after Rama V. Among these improvements, there were, for example, the passing of a law on compulsory primary education, a national scheme of education, national education development plans, and the University Council in 1956, which later changed its name to the National Education Commission in 1959 and to the Education Council in 2002. The National Education Commission (NEC) had the operating office called the Office of the National Education Commission (ONEC), which would play a significant role in later reform efforts. Because of the second amendment of the NEA in 2002, the NEC and ONEC changed their administrative structure to the Education Council and have their operating office called the Office of Education Council (OEC) (ONEC, 2003b). The ONEC, or later the OEC, has been the main organization in the Thai education reform efforts since 1956.

The second unofficial education reform (1973–1980) developed in response to the political instability and demands for changes of bureaucratic administrative systems in

the country. The Thai government promulgated a new constitution in 1974. This constitution recognized the importance of student equity, unity, and freedom of expression (Fry, 2002). The government assigned ONEC (2003b) to work with the Education Reform Committee to lay the foundation for Thai education reform later in 1974. The purpose of this reform was to use education to strengthen the people and build a desirable society. The ONEC submitted the proposal to the cabinet in 1978.

Along with these political and social changes, there were also important changes at the administrative levels in the area of education. For example, most primary schools outside Bangkok, supervised by Ministry of Interior, were transferred to be under the supervision of Ministry of Education. This resulted in academic unity (Ketudat, 2002; ONEC, 2002b). Thus, in this second phase of reform, the military, the students, and educational policy makers all contributed to advances in the Thai educational system.

The third unofficial reform (1990–1995) responded to the economic success and the awareness of increasingly internationalization of Thai people. These trends posed challenges to both the government and Thai education (Fry, 2002). During this period, the National Electronic and Computer Technology Center (NECTEC) initiated on behalf of the Thai government the first Information Technology 2000 policy, known as IT2000. The IT2000's first agenda was (a) to build a national information infrastructure, (b) to develop a literacy information technology workforce, and (c) to achieve good governance by integrating information technology systems (National Information Technology Committee Secretariat, 2003).

The third phase of Thai education reform involved the long-range effect of IT2000 policy that led to the government becoming decentralized, the educational institutions becoming internationalized, and the economic institutions becoming globalized.

This was the first time that Thais had begun to look beyond their own country to determine the basis for reform. However, the previously mentioned Asian economic crisis of 1997 revealed a widespread need for information technology personnel at all levels of the society. Thus Thais felt that it was increasingly important for instructional technology to become part of yet another attempt at education reform.

First decade of education reform (1999–2009).

This fourth education reform was the second official one, the first being under King Rama V (see above). It was the National Education Act of B.E. 2542 (1999) (NEA) which resulted from the enactment of the new Constitution of the Kingdom of Thailand B.E. 2540 (1997). It was the first education law in the history of the country (Sangnapaboworn, 2005).

The NEA brought in dramatic new changes to Thai education both in theory and practice. Among these new changes, for example, were those presented in chapter four of the Act, entitled "National Education Guidelines," in chapter seven, "Teachers, Faculty Staff, and Educational Personnel," and in chapter nine, "Technologies for Education." The extension of basic education from 9 to 12 years free of charge was a major advance that resulted from this act.

The objective of this new education plan was to develop students who would be lifelong learners, create an education environment that would focus on student-centered learning, and redefine the role of the teacher as a facilitator who enabled students to find their own way to greater knowledge and better learning skills through the use of information technologies. In terms of technology, the NEA mandated that the Thai government would provide the financial resources, the infrastructure, and the technological hardware and software for integrating the use of instructional technology into school curricula. This study described both the progress and the challenges that this latest reform effort entailed.

The National Education Guidelines in the NEA discussed the instructional frameworks for new teaching and learning processes. The Thai government recognized for the first time that technology should be a part of its educational reform. The NEA promoted the use of technology as an advanced tool to enhance the quality of education, as emphasized in chapter nine of the NEA, "Technologies for Education." Moreover, technology was envisioned as supporting three main principles of the NEA, namely, lifelong learning, involvement by government, business, and community in the provision of education, and continuous student learning both within and beyond the school. These three main principles reflected the core learning processes and education reform guidelines in chapter four of the Act, "National Education Guidelines." Most importantly the act proclaimed that there should be a new emphasis upon student-centered learning, a concept new to the vast majority of Thai educators.

Second decade of education reform (2009–2018).

The fifth education reform was the second decade of education reform, initiated in 2009. This dissertation does not cover the implementation plans of the second decade of education reform; however, some of the improvements and consequences of this second reform indicate the failures of the first reform during 1999–2009. The OEC published a report of the ninth year of Thai education reform in 2009. The report indicated mixed success during the reform. The most improvement during the first decade was in restructuring education agencies, implementing laws, and reorganizing education district. On the other hand, the core of the reform, which was about students and teachers, needed special attention. OEC reported that there was very little improvement on the quality of students. For example, the assessment on major subjects (English, Math, Science, and Social Science) had been lower than 50 percent since the beginning of the reform in 1999 (OEC, 2009b).

One of the principle problems with the NEA's program for educational improvement was that teacher development was not taken seriously. There was insufficient research on teacher professional development. At the end of the reform, teachers could not elevate the quality of students or quality of education enough to achieve the reform outcomes. OEC further reported that content used in media for classroom was poor. There was a need to develop better content and to train teachers to implement technology to support student-centered learning.

The second decade of Thai education reform focused on improving mechanisms that would help learners to learn and to be part of the society. In addition, the teaching

profession would be elevated and given more attention. The cabinet approved the proposal of the second decade of Thai education reform on August 18th 2009.

Purpose of the Study

This study provided an analytical critique of the National Education Act of B.E. 2542 (1999). It paid special attention to teacher professional development in relation to integrating technology into the classroom. It presents the history of the NEA and reports on how successful it was in reforming Thai teacher development, especially for integrating instructional technology into the curriculum. It also critiqued the ways in which the reform act fell short of meeting both the needs of teachers and of their students due to the often truncated attempts to implement these reforms. This study sought to determine what was best about Thai education reform proposals and how to build on it to achieve a better future for Thai teachers and students alike. Until Thai teachers were fully and adequately trained, they would find it difficult to adopt the NEA's constructivist vision or to use a student-centered method of teaching. The mission of this study was dedicated to the adoption advancement of such forward-thinking teaching philosophies among all Thai teachers.

Based on analysis of the findings of the research here reported, this study provides recommendations for improving teacher training for integrating technology into the curricula beyond the reform act of 1999–2009. These recommendations are directed toward improving future teacher professional development and propelling education

reform forward toward making progress and toward achieving more realistic goals of reform.

Research Questions

The following questions guided this analysis of the NEA during 1999–2009. This examination sought to understand what Thais have both achieved and/or failed to achieve in their first major attempt at educational reform. Given this stated purpose of the study, three questions have been addressed:

1. How did the implementation of the National Education Act of 1999 in Thailand affect Thai teacher professional development for using technology in education?
2. How did researchers and journalists evaluate the effects of Thai education reform recommendations on teacher training for using technology in education during 1999–2009?
3. What were lessons learned and further recommendations for improving Thai teacher professional development for integrating technology into education that resulted from the implementation of the National Education Act of 1999 in Thailand?

Significance of the Study

This study employed the historical research method. This method enabled citizens and educators alike to have a better understanding of the sources for and the future

prospects of Thai teacher professional development in integrating technologies into education during the first ten years of the reform.

Given the need to improve the Thai education system and the country's past below-par rankings in worldwide assessments, the results of this study contributed to the improvement of the quality of Thai teachers, teacher training agencies, teacher education schools, and other educational personnel, especially in integrating technologies in classrooms. In addition, the NEA had wanted to promote student-centered outcomes, focused on creating students who could learn for themselves for life. In the pursuit of this goal, this study provided recommendations to Thai teachers on how to understand a new way of teaching and learning based on the analysis of its history and of research on the topics addressed in the NEA. This included things such as the focus on teachers as adult learners and other constructivist methods for helping teachers to learn about and practice student-centered learning. The findings of this study also contributed to the improvement of the future of Thai teacher professional development with an emphasis on the integration of instructional technology.

Information technology was a game changer for both Thai teachers and students. The NEA proposed that teachers required a new philosophy of education – constructivism – and a new methodological framework for learning – student-centered learning. This study demonstrates how others have implemented these two methods in the service of advancing educational reform.

Scope of the Study

Teachers in this study meant those who taught at the basic education levels. At the basic education level, there were twelve years or levels. In these twelve years, education was divided into six years of primary schooling, three years of lower secondary, and three year of upper secondary. There were more than 600,000 teachers in basic education at the time of this study. Teachers in this group were affected by the NEA the most. They were the majority of teachers in Thailand. The implementation of the NEA, such as lifelong learning, student-centered learning, and integrating technology into curriculum had a direct influence on this group of teachers. For this reason, when this study refers to "teachers," it is referring to these teachers of basic education in Thailand.

While teachers were the focus of the reform, the scope of this study was limited to teacher training, teaching, and using technology in classroom. Other problems, for example, teacher shortage, decline of teacher status, out-of-field teaching, or pre-service teacher training programs were referred to, but not in detail, where necessary.

One great use of technologies for education was to reduce the digital divide, namely, the separation between schools in the city and schools in rural areas. This problem existed in Thailand in terms of limited networking between rural and remote areas. However, this problem seemed to be decreasing according to some studies (Fry, 2002; Nakornthap, 2004; Pillay 2002). For this reason, this study did not focus on the digital divide of networking in Thailand, but it referred, where necessary, to the readiness of Thai teachers to use the available digital contents of multimedia resources in the classroom.

Thai teachers were strong in using instructional television via satellite. The country had its own satellite and funding to support it. This distant learning technology existed during the time of this writing. However, this study did not include instructional television via satellite because, first, Thais used this technology for broadcasting from the Wang Klaikangwon School to remote schools across the country. Since the broadcast was one-directional, it did not reflect how teachers integrated technology into the curriculum because it was not created by teachers in the classroom. While turning on the television was using technology, it was not teacher-initiated and thus not an "instructional" use of technology. The instructor's role was minimal. Second, Thais used instructional television via satellite to decrease the problem of a teacher shortage in the remote areas (Vajaarodaya, 2004). The purpose of the project reflected the limited uses of television as a substitute for teacher rather than as an instructional use by teachers.

During the time of this study, there were three amendments of the NEA, that is, B.E. 2542 (1999), B.E. 2545 (2002), and B.E. 2553 (2010). The modifications were in chapter five, "Educational Administration and Management," chapter six, "Educational Standard and Quality Assurance," and "Transitory Provisions" of the NEA. The amendments of these chapters did not affect this study. This study acknowledged these changes, but included these three amendments as part of the NEA. However, some description of these amendments is necessary to understand the act and the attempts to implement it.

The first amendment of the NEA was implemented in late 1999. The second amendment was added because of the bureaucratic reform in 2002 and the third in 2010.

The third amendment was promulgated in 2010. The differences between the NEA 1999 and the Amended NEA 2002 were the name of the ministry (Section 5), the responsibilities and the administrative structures of the ministry (Chapter 5), and adding a phrase "the Commission of Vocational Education" in the Section 51 of chapter six Educational Standards and Quality Assurance. The name of the ministry changed from the Ministry of Education, Religion and Culture to the Ministry of Education. The responsibilities of the ministry were changes from "overseeing all levels and types of education, religion, art, and culture" to "promoting and overseeing all levels and types of education". And two out of four administrative offices were changed their titles. First, the "National Council of Education, Religion and Culture" was changed to the "National Council of Education" and, second, the "Commission of Religion and Culture" was changed to the "Commission of Vocational Education" (ONEC, 2002a; ONEC, 2003a). The third amendment had the changes in the administration in educational service areas in section 37 and 38 (Royal Thai Government Gazette, 2010). These amendments did not affect this study. As a result, the NEA in this study includes all the three amendments.

This study was a historical research project. Primary and secondary sources used in this study included available documents in government publications, fact sheets, reports, international and local research articles, newspaper articles, and content from Web programing. Some of these sources were documented in a systematic way, that is, they had title pages, name of the author, publication date and year, and publishers. On the other hand, some were not. Unfortunately, this researcher found that some publications, both hard copy and online documents, did not have proper references. Thus, even when

the researcher knew the relevance of the content in a study, he could not always determine its reliability in term of its source or its veracity due to the incompleteness of its source information. In other ways, this researcher strived to document fully all the key sources used. Chapter two presents a review of literature relevant to this research.

Chapter Two: Review of Relevant Literature

The foundational resources for this analysis of Thai education reform in relation to teacher development in using instructional technology were primary and secondary literature that provided insights into educational history, theory, research methods, and reform proposal and plans. In this chapter the focus is twofold. First, there is a summary and critique of the sources that provided historical data about Thai educational reform in general and about the NEA in particular. The goal here is to not only reveal which sources were most useful for constructing a historical overview in particular but also to provide an evaluation of the usefulness of most sources for educational research in general. Second, a summary and critique of sources that address the attempt of Thai educational reform policy to incorporate modern learning theories into their reform projects. These include such things as adult and self-directed learning theory as well as constructivism. In this way, this chapter shows the research value of relevant sources relating to Thai educational reform, the NEA, and teacher development.

National Education Act Policy and Thai Teacher Education

Education reform continued beyond the first four phases, which was presented in chapter one as the historical overview of education reform in Thailand. In 1997, the Office of the National Education Commission (ONEC) conducted documentary research on the reform strategies, policies and experiences of 11 countries. The knowledge gained from this ONEC study was "adopted to suit the socioeconomic, political, and cultural

context of Thailand" (ONEC, 2002c, p. 2). This draft became the National Education Bill and the National Education Act B.E. 2542 (NEA) in 1999. The NEA was amended in B.E. 2545 (2002) and B.E. 2553 (2010), which were presented in the scope and limitations of that study in chapter one.

The NEA formulated educational policy for the future of Thai education in ways that were both promising and challenging. As such, it sought to bring dramatic changes to the Thai education system. However, the way the NEA described the future of Thai education was vastly different from the teaching practices to which students, teachers, administrators, and parents were accustomed. This dramatic shift, which if implemented would have been a major cultural reversal, was virtually overlooked in the NEA. For instance, in chapter nine, the NEA envisioned that technology would be an important tool for the future of Thai education. The NEA also wanted to leverage new quality standards of its teachers. It provided policies for teachers, faculty staff, and education personnel in chapter seven of the act. Most importantly, in order for students to thrive in a knowledge-based society, the NEA envisioned a new generation of Thais as independent learners, who engaged in the continual improvement of knowledge and skills. This was described in chapter four of the NEA, "The National Education Guidelines."

Because this study focused on how Thai teachers were trained to use technology in the classroom, the research centered primarily on the NEA's chapters four, seven, and nine, but in the reverse order. This was due to the descending relevance of each chapter to the issues of using instructional technology in the classroom.

After learning from the news media about the low quality of Thai education and

its low ranking in global competitiveness, many Thais viewed teacher development as the most crucial sector that needed to be improved in Thai education reform. Policymakers and researchers (Fry, 2002; Miller, Lu, & Thammetar, 2004; Nitungkorn, 2001; OEC, 2013; Pillay, 2002) suggested that restructuring the teaching and learning processes at the graduate level of teacher preparation to support constructivist and lifelong learning would be a most pressing need for a new generation of teachers. A study by Australian researchers Ainley, Arthur, Macklin, & Rigby (2001) insisted that Thai educational improvement must be established as a national agenda that involved several agencies, such as the MOE and ONEC, in order to restructure and redesign educational curricula to support the new teaching and learning philosophy the NEA had introduced – namely constructivism – as the overall educational philosophy, which in turn emphasized a student-centered learning environment as crucial to the teaching agenda.

The NEA's introduction of the philosophy of constructivism and of the student-centered instructional method was a core recommendation for its plan of reform. Adopting these ideas would mean that, for the first time in Thailand, teaching and learning in the classrooms would not be based on a chalk-and-talk teacher-centered methodology. Thai teachers would need to change their role from being authority figures, who were the source for all learning, to become facilitators who made possible technological highways and byways so that students could learn on their own. This was the cultural upheaval that the NEA unwittingly proposed.

In 1997, teacher education and teacher professional development were administered by the Ministry of Education and the Ministry of University Affairs (name

changed later to the Office of the Higher Education Commission under the Ministry of Education during the time of this dissertation research). The Ministry of Education was responsible for the Rajabhat Institutes, the Rajamangala Institute of Technology, the Department of Physical Education, the Department of Vocational Education, and the Department of Fine Arts (ONEC, n.d.). These institutes all had important roles to play in advancing Thai education reform.

One of the earliest places to start in discussing Thai teacher development was with The Rajabhat Institutes. The Rajabhat Institute was originated from teacher training colleges. After the Teacher Training College Act of 1984, these teacher training colleges were transformed to the Rajabhat Institutes. Their original purpose was to produce and to train teachers at the certificate level. At the time of the study, there were 40 institutes located mostly in major provinces. The Rajabhat Institutes were elevated to university status in 2004. They were then authorized to offer graduate degrees. Because of their wide proliferation, these graduate-level institutes provided easy access to higher education for local communities (Pillay, 2002). The resulting increase in teachers' knowledge and skills was a good step towards confronting Thailand's low teacher-competency ratings.

In addition to Rajabhat Universities, there were also faculties of education that served as the main groups for producing credit courses for teachers ranging from graduate degrees to the doctoral level in diverse educational programs. At the time of this study, there were 17 faculties of education. Some of these institutes offered short, intensive courses in education that were for training purposes but not for academic credit.

In addition to Rajabhat Universities and faculties of education, there were an additional 35 private universities, colleges, and institutions offering teacher education in universities.

Other institutions or organizations also performed teacher training in specialized areas. There was, for instance, the Institute for the Promotion of the Teaching of Science and Technology (IPST), founded in 1972, who provided intensive in-service training for science, mathematics and technology teachers. Waitayangkoon (2007) reported that IPST established a teacher professional development program in 1995. The primary objectives were to (a) develop, support and empower lead trainers for in-service teacher training in using instructional technology tools, (b) designed relevant instructional technology training materials, (c) utilize distance-learning technology to train the trainers and teachers, and (d) facilitate teacher trainer through a network of local authorities and organizations. The IPST developed educational technology tools and designed technology courses for students at all 12 grade levels within the cluster of Technology and Career subjects. It utilized the MOE's instructional technology curriculum standards, part of its core subjects standards in 2001. The role of IPST expanded over the years. However, Pillay, (2002) and Waitayangkoon (2007) reported that no details on content, pedagogy used, and effectiveness of those training courses were available. Thus, it was not possible to gauge the success or failure of their implementation.

The Ministry of Education (MOE) contributed in a major way to teacher development in Thailand by allocating budgets to organizations such as the Department of General Education, the Office of the National Primary Education Commission, and the

Office of the Private Education Commission (Pillay, 2002). In particular, the NEA dealt with teacher development in chapter seven. A review of the concerns and limitations of chapter seven of the NEA are presented in chapters four and five of this study.

The NEA's chapter nine, "Technologies for Education," strongly encouraged Thai teacher professional development in the use technology in the classroom. Several principles of the NEA were advanced in this chapter. The NEA proposed that, with proper training and use, technologies should enable future Thai generations to teach themselves throughout their lifespans. Similar to what it had stated in chapter four, Section 66 of chapter nine the NEA stated that:

> Learners shall have the right to develop their capabilities for utilization of technologies for education as soon as feasible so that they shall have sufficient knowledge and skills in using these technologies of acquiring knowledge themselves on a continual lifelong basic. (p. 30)

To promote the use of technologies in education, the NEA also encouraged the development of both producers and users in the previous section, Section 65, by noting "…that they shall have the knowledge, capabilities, and skills required for the production and utilization of appropriate, high-quality, and efficient technologies" (p. 30). Its encouragement of using technology was not only limited to students in the classroom. In addition, the NEA wanted to foster the research and development of high-quality instructional technology production for its students beyond the schools. Further, Section 67 of the NEA wanted to be engaged in "…following-up, checking, and evaluating their use of technology to ensure cost-effective and appropriate application to the learning

process of the Thai people" (Section 67, p. 30). The realization of these policies was the responsibility of those charged with implementing the NEA.

Significantly, the NEA did not ignore the fact that increasing the use of technology in education would cost money. Section 68 stated that an Education Development Fund would be established by securing financial resources from "…state subsidies, concession fees and profits from enterprises relating to mass media and information and communication technologies from all sectors concerned, namely, state sector, private sector, and other public organizations" (p. 30). However, it was not until 11 years later that the Office of Technology Development Fund was established on December 8th, 2010 under the supervision of the Ministry of Education (Office for Educational Technology Development Fund, 2011).

In order to sustain the development of technologies of education, the NEA explicitly wanted to establish "… a central unit responsible for proposing policies, plans, promotion and co-ordination of research, development and utilization of technologies for education…" as stated in Section 69 (p. 31). The Thai government, through the Bureaucratic Restructuring Act of B.E. 2545 (2002), established a new ministry called the Ministry of Information and Communication Technology in October 2002 (Ministry of Information and Communication Technology, n.d.). This ministry was responsible for establishing policy and planning for information and communications technology (ICT) for the country, including planning for the use of technology in education. The value of this source was that it was one of the first attempts to spell out a comprehensive program for teacher development in the Thai educational environment. As such, it was the

foundational source to which other reform proposals would be compared.

Not only did the NEA discuss proposals for using instructional technology in the classroom, it also discussed the importance of teachers and other educational personnel in the reform process. The NEA had a high expectation that technology would support teaching and learning in classrooms. In chapter seven, which was entitled "Teachers, Faculty, Staff, and Education Personnel," a plan for teacher professional development was presented in Section 52. The MOE, in this section, said that it would take responsibility for the supervising and coordinating role in ensuring that the institutions responsible for promoting and supporting teacher development would be fully able to provide the necessary knowledge and skills for teachers and staff. Its provision for their promotion and support included the budget to establish the Fund for Development of Teachers, Faculty Staff, and Education Personnel. The MOE created also an institution called the National Institution for Development of Teachers, Faculty, and Educational Personnel (NIDTEP) to support the implementation of this section in 2005. NIDTEP was assigned to be a central organization for coordinating the development of teachers, faculty, staff and educational personnel for both public and private sectors. Furthermore, NIDTEP would be responsible for drafting and proposing teacher professional development policies to the government. The importance of chapter seven of the NEA was that it highlighted the centrality of teachers and other educational personnel in the reform process. It proposed a method of reform that would include both technology utilization and teacher development.

The NEA reform was based on a modern vision of students as lifelong learners

who could use technology to develop themselves outside the classroom. While chapter four of the NEA did not specify how learners should use technology, it did emphasize that technology was a mechanism that enabled learners to learn. For example, in Section 22 of the NEA, an instructional framework for new teaching and learning processes was discussed, and it emphasized that:

> Education shall be based on the principle that all learners are capable of learning and self-development, and are regarded as being most important. The teaching and learning process shall aim at enabling the learners to develop themselves at their own pace and to the best of their potentiality. (p. 10)

Using technology for education was not explicitly stated in chapter four of the NEA, but it was implied as one of its mechanisms for teaching and learning in this section. Implicitly, this section stated that all student learners in the country had a right to use instructional technology to grow and develop as informed and skilled learners, working at their own rate of growth. At the time of this writing in 2014, most students worldwide learn most quickly and efficiently through the use of information technology. Thus, in chapter four of the NEA, information technology was an unstated tool by which self-learning would be enabled. Of course, information technology is not the only tool or even the only method that one can use to study and to learn. However, the use of information technology had advantages over many other ways of learning. For example, it provided an easy and quick way to access a vast amount of information. The tacit conclusion that the NEA promoted was that using information technology would be the

only possible way for these self-learners to advance. This premise will be revisited as part of the recommendations in chapter five.

Furthermore, the NEA, particularly in Section 22, underscored the seriousness of students' learning to learn by themselves. This section also suggested that any learning circumstance should be based on the student's potential. Moreover, Section 24 (3), which discussed teaching methodology, insisted that educational institutions and agencies should accommodate their learners with activities that "…draw from authentic experience; drill in practical work for complete mastery; enable learners to think critically...." Section 24 (5) added that educational institutions and agencies should enable instructors to create a learning "… environment, instructional media, and facilities for learners to learn…. In doing so, both learners and teachers may learn together from different types of teaching-learning media and other sources of knowledge." Section 29 of the NEA asked for cooperation from "…individuals, families, communities, community organizations, local administration organizations, private persons, private organizations, professional bodies, religious institutions, enterprises, and other social institutions…" as sources of learning for community development (NEA, p. 11).

These sections of the NEA reveal how interactive the new reform environment would be for using instructional technology as a teaching tool. Rather than focusing solely on the teacher/student dyad, the NEA foresaw an important role for many different sectors of the community: Teachers, of course, would be involved. But the student as learner and other members of the community as facilitators also had roles to play. This was perhaps the first time that a Thai reform policy was so inclusive in its view of

teachers, students and community involvement. Because the act allowed schools to develop their own curricula based on local resources, in addition to the national curriculum, schools also could benefit from local wisdom and other sources of learning in their communities.

Beyond the personnel concerns of chapter seven, the NEA was also forward-thinking in its concern about pedagogy. The introduction of technology in chapter nine played a vital role in supporting the introduction of instructional methods related to the philosophy of constructivism found in chapter four, a philosophy that views the student as the focus of the learning process. The NEA expressed the belief that learners were capable of self-learning and self-improvement. It specified that learners were the center of all educational activities. It wanted to enable learners to pursue their own interests at any time of their choosing. It specified that schools that integrated local wisdom and resources into their own curriculum must also provide learning environments that gave learners the opportunity to practice what they had learned. Finally, the NEA stated that the primary role of the teacher was to facilitate learners by helping them to learn with and from technology. This approach was known as the student-centered learning from a Western-education point of view. Thus, from one perspective, the NEA seemed to have reached an insightful and inclusive overview of future Thai educational reform in using educational technology in the classroom. The present study found, however, that there were still important aspects of teacher training and student engagement that the NEA overlooked. These results are presented in chapter four of this study.

Thai Teacher Training to Use Technology Experiences

Given the long history of the teacher-centered approach in Thai classrooms, the Office of the National Education Commission (ONEC), which was the central office designated to implement the reform plan of the NEA, realized that there were several new types of knowledge that needed to be included in the implementation of the NEA. These new types of knowledge had already been discussed in ONEC's research. These new insights were how to use technology to teach in the classroom and how to implement a constructivist classroom with a student-centered learning environment. However, both of these principles contradicted the method already being used by Thai teachers in their classrooms (OEC, 2005). For example, future teachers would need to develop both technical and practical skills in order to integrate instructional technology into their lesson plans. Teachers would also need to change their roles from teacher-centered and authoritarian to student-centered and collaborative by taking on a new role as a learning facilitator. They would need to have lesson plans that stimulated students to become lifelong learners. The issue at hand was how to implement this new approach in support of constructivist knowledge building and teaching model.

By focusing on these two types of knowledge, the ONEC attempted to help Thai teachers to go through a transition toward reform under the direction of the Ministry of Education (MOE) by taking responsibility for creating the National Pilot Schools project. The National Pilot Schools project was initiated by the ONEC after the promulgation of the NEA in late 2000. The project was conducted under the framework of chapter four, "National Education Guidelines," of the NEA, that is, the creation of a student-centered

learning environment (Piya-Ajariya, 2002). The conceptual framework of the project was to make learning more expansive, cooperative, and open-ended. Teachers, administrators, and local communities developed contents based on self-development and self-learning, which would allow students to develop lifelong learning skills. The goal of this pilot project was to test the feasibility of new approaches to education and to identify possible problems or obstacles that might emerge. Teachers benefited the most by being trained to teach classes using learning sources that were not limited to a textbook or to the teacher (Piya-Ajariya, 2002).

Two-hundred-and-fifty schools participated in the National Pilot Schools project. Each participating school was provided with a basic framework to guide its activities and to enable the implementation of a new learning reform. Wiratchai (2002) reports that the pilot project was divided into three distinct phases: Phase I (December 2000 – April 2001) – conducting student-centered learning workshops; Phase II (May – October 2001) – two follow-up workshops and four wrap-up workshops to monitor and assess the school reform process; and, Phase III (November 2001 – May 2002) – during which these 250 pilot schools were expected to work with and train at least five to ten nearby schools on a volunteer basis. It was not clear how much technology was involved in this pilot schools project. However, the goal was that teachers, as mentioned in the one of the objectives, would become able to teach in a student-centered environment that included technology, where authentic and lifelong learning could take place. Further, technology would support a variety of teaching and learning approaches revolving around constructivist methods (Wiratchai, 2002).

A question that emerged was just how successful were these school-based initiatives. Nakornthap (2004), the director of the Center for Education Policy, Chulalongkorn University, reported that the expansion of information-technology infrastructure to schools and educational institutions nationwide was at a satisfactory level in the year 2003. Most secondary schools, vocational schools, higher educational institutions, public libraries connected to either *SchoolNet* – supervised by Ministry of Education, or to *EdNet* – supervised by the Office of Higher Education Commission. He urged further studies to measure the achievement of how these networks, when connected to schools, affected teachers using technologies for teaching and learning in a new environment. Few research studies have focused on which teaching strategies were used in providing Thai teachers professional development as proposed in the NEA. For example, the Teacher Education Reform Office, as cited in Pillay (2002), proposed an academic coupon for in-service training. The coupons could be used by teachers to finance teacher training programs. Teachers would be given these coupons with a certain cash value per year. They could then use these coupons to participate in training programs that suited their needs instead of being sent by schools to attend training courses that often did not meet their needs. Teachers could use these coupons with government and private training agencies in seven core subjects, namely, mathematics, physics, chemistry, biology, computers, English, and Thai ("ONEC urges academic coupon," 1997). Unfortunately, there were no further reports on the status of reform implementation from this proposal.

UNESCO projects promoting Thai teacher training for using instructional technology in classroom.

The United Nations Educational Scientific and Cultural Organization (UNESCO), whose goals were to promote, provide, and improve education in numerous countries, began to be actively involved in improving Thai teachers' professional development to use information and communications technology (ICT) in 2003 ("Policy," n.d.). In 2006, one of their projects called the *National Training Workshop for Teacher Educators,* funded by Japanese Funds-in-Trust (JFIT), was held in Thailand during August 28 – September 1. The purpose of this five-day training, was to (a) educate teachers about ICT resources and tools for enhancing teaching and learning, (b) train teachers to become facilitators, (c) educate teachers about competency-based standards, (d) promote learning-centered teaching pedagogy, and (e) practice learner-centered activities ("Sixth National Training," n.d.). Twenty-five teachers and teacher-educators from teacher training universities in Thailand participated in this training. Unfortunately, there was no evaluation report available on these workshops.

UNESCO also had developed a series of research studies in several fields and in several countries in Asia Pacific. They made these studies available on the Web. The knowledge gained from UNESCO's studies, particularly their promotional use of ICT in education, opened the worldview of using ICT in Thai classrooms. In the meantime, these data helped Thais to know what other Asian countries were doing that might aid in their own efforts at reform.

Relevant Learning Theories and Frameworks for Improving Teacher Professional Development

In Western theories of education, Malcolm Knowles formulated a theory that teaching adult learners was different from teaching the young (1984a). Knowles called it andragogy. This theory can teach much about the training of adult teachers.

Research literature suggested that Thai classrooms used the same teaching strategy for both adult and child learners. Siribannapitak (2003) suggested that Thai teacher training and development needed to find a new pedagogy for teaching adults effectively. Based on this literature, it was time for Thai educators and scholars to pay attention to adult learning theory. In addition, with increasing use of technology for teaching and learning, it was important for teachers to learn how to incorporate technology into specific content areas using Technological Pedagogical Content Knowledge (TPACK) framework (Mishra & Koehler, 2006). These suggestions, when adopted, would help Thai teachers to benefit from an adult-centered teacher development, which in turn, would help them to teach and facilitate in a student-centered environment. These theories will have great value for achieving the goals of the NEA and are discussed below.

Adult learning theory and self-directed learning.

One area of concern is the manner in which previous programs approached the training of adult teachers. They were not taught as adults at all but as students in the same chalk-and-talk method so widespread in Thailand. Incorporating adult learning theory

into teacher training programs will enhance reform outcomes because training teachers as adults provides helpful benefits such as teacher input. An examination of adult learning theory such as the one provided by Malcolm Knowles reveals how Thai teacher training programs might be different.

The theory of adult learners has a specific root with subsequent branches out from it. Knowles (1970, 1980, 1984a, 1984b, 1989) was the first theoretician who tried to differentiate the adult learner from the child learner. He stressed the importance of andragogical or adult learning rather than pedagogical or child learning. He outlined six main assumptions of this view:

1. *The need to know:* Unlike children, adults wanted to know the reasons why they needed to learn, how it would benefit them, and how the learning would apply to their lives.

2. *The learner's self-concept:* Having a self-concept meant adults were moving from a dependent-learner status to become an independent personality. Through maturity, adults developed a psychological need to be a self-directed learner and needed to be free to participate in setting their learning needs, goals, and strategies that work best to meet their needs.

3. *The role of the learner's experience:* When a person becomes mature, he or she has accumulated a growing reservoir of experience. This experience was the main foundation for learning activities of adults. Knowles insisted that it would be beneficial to tap into the diversity of experiences through the use of experiential techniques. Such

techniques could be group discussion, simulation exercises, and problem-solving activities.

4. *The learner's readiness to learn*: Adults were ready, able, and willing to learn. Generally, they became ready when their real-life situations created a need to know in order to cope with tasks or problems. Knowles insisted that the learner's readiness to learn, most of the time, did not occur only from the inside. It was also stimulated by having a greater responsibility or requiring a better performance as well.

5. *The learner's orientation to learn:* Adult learning was about one's life situation. That is, they sought skills or knowledge they needed to apply to real-life tasks or problems. Adults had a more task-centered or problem-centered orientation to learning rather than a subject-centered learning like children, who had to pass a course to be promoted to the next grade.

6. The *learner's motivation to learn*: The most important motivators for adult learners were internal priorities. Incentives such as increased salary, job satisfaction, quality of life, and the like, were important in giving adults a reason to learn. Knowles insisted that adults were motivated much more internally than externally (Knowles, 1970; Moore & Kearsley, 1996).

In addition to the practice of adult learning theory as formulated by Knowles, the theory of self-directed learning (SDL) also helped to define adult learners as different from child learners. In SDL adult learners take responsibility for their own learning, both the choice of subject they learn and the pace of their learning. SDL had been influenced by a number of adult teaching and learning theories, such as Knowles, and definitions of

adult development, for example, andragogy and cognitivism (Knowles, 1975, 1980; Merriam, Caffarella, & Baumgartner, 2007).

Other scholars emphasized the value of SDL when using technology, such as SDL skills for online learning environments (Song & Hill, 2007) or professional development for experienced teachers using the Technological Pedagogical Content Knowledge (TPACK) framework (Koehler & Mishra, 2005; Harris, 2008). In fact, as the world became globalized – where companies, societies, and telecommunication were linked on a global scale – SDL became more important to the success of individuals, because it encouraged and enabled them as adults to explore the whole world as a learning environment.

Knowles (1975) was one of the theorists of adult learning who advocated SDL, viewed it in its broadest meaning as:

> A process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. (p. 18)

Knowles gave three most important reasons why SDL was necessary. First, he insisted that there was convincing evidence that people who initiate their own learning, Knowles called them "proactive learners," learned more and learned better than those who sat and waited to be taught, those whom he called "reactive learners."

Second, Knowles believed that as people grew older, they tended to develop the ability to take responsibility for their own lives. He saw the pattern of SDL as compatible

with this natural process of psychological development. We depended on parents and teachers when we are young. When we grew up and became mature, we increasingly developed a deep psychological need to be independent. Knowles saw this process as an improvement in self-direction.

Third, Knowles reflected on new developments in contemporary education of theory and practice, such as new curricula, open classrooms, independent study, and distance learning. Learners had to be more responsible when using these educational improvements. Knowles argued that without using the learning skills of self-directed inquiry, students who entered into these programs would experience anxiety, frustration, and often failure.

SDL, however, is not the only new learning environment that is helpful for adults. There is also Technological Pedagogical Content Knowledge or TPACK.

Technological Pedagogical Content Knowledge (TPACK).

Other theories also advanced new models of teaching and learning to improve Thai teacher professional development. While working on finding the right combination of what kind of knowledge teachers should acquire to become good teachers, Lee S. Shulman (1987) found that deep pedagogical content knowledge was likely the best solution that teachers could have. Using pedagogical content knowledge, Shulman said teachers would have the ability to understand how particular topics, problems, or issues were organized, represented, and adapted to the diverse interests and abilities of adult learners. Koehler and Mishra (2008), who shared the same view as Shulman, saw the

teachers' role as that of autonomous agents. Teachers could significantly influence the integration of technology in their classrooms. Koehler and Mishra argued that teaching with technology was "a highly complicated form of problem-seeking and problem-solving that derives from flexible and integrated bases of knowledge" (2008, p. 3). As a result, they developed a framework for teacher knowledge that was optimal for technology integration, which they called Technological Pedagogical Content Knowledge (TPACK).

Koehler and Mishra (2008) emphasized that the TPACK framework "describes how teachers' understanding of technological knowledge and pedagogical content knowledge interact with one another to produce effective teaching with technology" (p. 12). To illustrate, Mishra and Koehler (2006) depicted a complex and interactive concept of TPACK as shown in Figure 1.

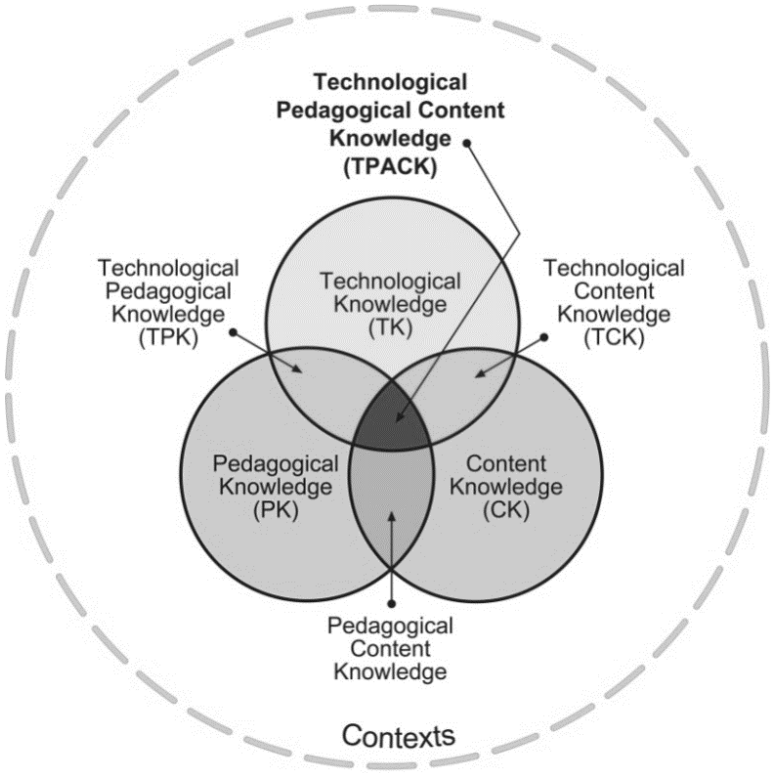

Figure 1. Technological Pedagogical Content Knowledge framework. Reprinted from http://tpack.org/

Koehler and Mishra said there are three main knowledge components and four other types of technology integration knowledge that connected, interacted, and interplayed among these different types of knowledge. These were (a) content, (b) pedagogy, and (c) technology. The interactions among these components were equally important. Those interactions were:

1. *Content knowledge* (CK) was the subject matter that was to be learned or taught as well as practiced in developing new knowledge.
2. *Pedagogical Knowledge* (PK) described the practices, processes, strategies, procedures, and methods of teaching and learning. Teachers with deep understanding of pedagogical knowledge knew how students needed to interact

with and construct knowledge in order to learn well. As a result, teachers applied learning theories to students in the classroom.

3. *Technology Knowledge* (TK) was the most crucial knowledge. Because technology was dynamic and could be outdated by the time we finished defining the term, Koehler and Mishra (2008) defined the TK as no "…'end state' but rather sees it developmentally, as evolving over a lifetime of generative, open-ended interaction with technology" (p. 15).

The interaction of the three formulations also produced three other types of knowledge related to technology integration:

1. Pedagogical Content Knowledge (PCK) – knowledge of teaching approaches.
2. Technological Pedagogical Knowledge (TPK) – knowledge of using technology to implement different types of teaching methods.
3. Technological Content Knowledge (TCK) – knowledge of presenting subject matter by using technology.

In sum, the theory proposed an overarching concept of Technological Pedagogical Content Knowledge (TPACK) – knowledge of integrating technology to enhance teaching approaches in teaching content.

Koehler and Mishra believed that their TK definition was closest to the Fluency of Information Technology (FITness) as proposed by the Committee of Information Technology Literacy of the National Research Council in the U.S. (Koehler & Mishra, 2008). Therefore, in this sense, the definition of technology required a deeper understanding and mastery of information technology for information processing,

communication, and problem-solving than did the traditional definition of computer literacy. With all these requirements, Koehler and Mishra believed that a teacher performed different tasks using TK in endless ways. Finally, when all three components (T, P, and C) merged, technological pedagogical content knowledge assumed the form of knowledge that expert teachers can bring into technology enabled classrooms.

How much was enough to know about technology for teachers teaching with technology? Koehler and Mishra (2005) argued that many research papers, funds, standards, and organizations were working, investigating, and trying to answer this question. "In other words," they said, "though these standards tell us *what* teachers need to know, they often do not tell us *how* they are supposed to learn it" (p. 94). While many researchers thought that traditional training would help teachers to become expert in using technology, Koehler and Mishra insisted that these approaches were only to teach them to become "consumers of knowledge about technological tools, with the hope that teachers would be able to apply this general knowledge to solving problems particular to their classroom situations" (p. 94). As a result, Koehler and Mishra said that viewing technology as a tool would create more tools. When there were more tools, teachers learned more and spent more time with these tools. As a consequence, there was no way to know when "enough was enough" for teachers learning and teaching with the new approaches to information and learning technologies.

The technological pedagogical content knowledge (TPACK) framework required teacher knowledge for technology integration as being a transaction among the three components. In order to bring this concept into practice, Koehler and Mishra (2005)

offered the *Learning by Design* approach. According to Koehler and Mishra, there were three advantages. First, the design phase happened naturally. Teachers felt more comfortable in the designing environment. Second, when designing, teachers built specific knowledge that mattered to their areas of interest. Third, after all the design processes, there was nearly always somewhere that a technology element could be integrated. Instead of focusing on the latest tools and how the new tools could apply to their classroom practices, the Learning by Design approach had teachers focus on a problem of practice and sought a way to use available technology to solve educational problems. Teachers now were active learners, who not only learned how to learn about technology but also learned how to think about technology to help them achieve their goals.

Using a learning-by-design approach, Thai teachers, who were pinpointed as the weakest links in the reform, could bring up and use their existing curricula or projects as a problem of practice. Teachers who had problems of defining the term "student-centered" could get together in groups that take turns discussing it and searched for other dimensions of the term through role playing. Finally, they could videotape themselves when they practiced in classroom-like situations. They could make a presentation from their understandings with any tool and available technology. They could expand and exchange their knowledge with other schools. During the process of design, Thai teachers could become active learners. They might also be able to find a better context than the terms that were used in Thai education reform.

Student-centered and constructivist theories of learning.

Of the proposals adopted by the NEA, the most radical and promising was that Thai educators adopted constructivist methods in the classroom to replace the old teacher-centered techniques that had been widespread for decades. The next section presents a review of the origins and techniques of constructivism and it relation to the NEA and training teachers to integrate technology and curriculum.

The roots of constructivism are quite distinguished. In *Emile or On Education,* Jean-Jacques Rousseau (1979) expressed his belief that children were born good until they were part of the community. He was the forerunner of learning from real experiences. Rousseau's solution to counter the corrupt society was to isolate the children until they could develop their independence, judgment and understanding, by which they could deal successfully with a distorted environment.

Earlier learning theories had also taken into consideration the centrality of the student. Rousseau did not articulate many teaching methods that we can use today, but he captured how meaningful were childhood experiences in the learning process. He emphasized what a child needed and wanted to learn first. He asserted that education should have a purpose that the child could understand. To learn effectively, learning must be from the perspective of a child's needs and wants. He said "never substitute the sign for the thing except when it is impossible for you to show the latter, for the sign absorbs the child's attention and makes him forget the thing represented" (p. 170). Rousseau said children were active beings. They needed movement and activity. We should use these advantages to arrange and organize the learning environment. Education without a forced

atmosphere, Rousseau claimed, could encourage the child's interests and desires to reach his or her potential and talents. In addition, Rousseau mentioned that he preferred a tutor rather than a teacher to instruct a child. The child should be able to discover real experiences that he or she wanted to know. In these remarks, one can see the precursor of ideas later formulated by Dewey, Knowles, and Neill.

Dewey (1964) did not tell us exactly what progressive education was. Instead, he reminded us to think what really happens when learning took place. He emphasized that not all students were the same. They came to school and brought in the complexity of their abilities, interests, experiences, and histories. So it was the teachers' obligation to minister to these individual differences. Moreover, Dewey claimed that teachers must teach students how to learn and not to focus on the subject matter itself. Students' interests were most important. They should be able to learn according to what they liked and what curiosities they had. Although, many people have had a concern with placing students at the center of education, particularly on the view of pursuing students' own interests, Dewey explained that students' freedom was the freedom based on their intelligence. He did not mean that a student should do whatever he or she wanted. This freedom was for students to choose and to have self-discipline in learning by themselves.

To support the student-interest learning paradigm, Dewey advised that teachers had to transform their roles from authoritarian to facilitator. Teachers needed to be organizers in integrating subject matter with children's life experiences by observing the capacities and needs of each student. They had to determine what learning activities were appropriate for their students (Brooks & Brooks, 1999). Subject matter or content should

be arranged to fit the conditions, development, and needs of each student. Dewey further explained that by understanding students' past experiences and knowing their interests, teachers must shape the curriculum to fit the students' learning needs.

Dewey's vision for good schools was tied to his vision of a good society. He saw school as a place to educate students who were capable of investigating, solving problems, and becoming good citizens in the larger society. School, especially for the young, should reflect their home-life activities. These activities, such as sewing, cooking, and constructing, allowed children to learn to take part in their families and later, by extension, in society. Academic skills would be an expansion beyond these activities. Additionally, he viewed each classroom as representing a small social organization that formed part of the larger community. It should be the place where students could learn what life was like in society. Dewey's idea about schooling was to view it as a small democracy that eventually created a more loving society.

Another prominent educator whose ideas and practices were reflected in the NEA's recommended program to improve education in Thailand was Maria Montessori (1870–1952) Montessori's education theory has been identified as a student-centered pedagogy; however, her teaching and learning approaches were different from those in student-centered philosophers. Montessori's students were like other students in the progressive learning environment, though their freedom was limited within a carefully prepared environment. This environment was designed to meet the needs, interests, abilities, and development of the children. Moreover, she thought that the learning environment was as equally important as the learning itself. Her classrooms were

carefully designed. For example, children-sized furniture, miniature chairs, tables, and low chalkboards were used and stored in specific ways (Montessori, 1912). She felt that these more appropriate environments allowed children to feel safe as well as to gain self-confidence to work in their classrooms. Another important fact, Montessori insisted, was that learning in a manipulated environment was the way to empower children to concentrate on their learning and to feel comfortable with their surroundings.

Montessori's method emphasized respect for students. She believed that each child must be respected, treated as an individual, and seen differently from adults. She believed that if children were respected, they would grow up into adults who would respect others. Montessori children, furthermore, learned in mixed-age-group environments. Montessori believed that older children could help the younger children to learn. In the meantime, the older children would act as role models for the younger children. In such a cooperative environment, these children were encouraged to treat one another with kindness and respect. They learned to be collaborative rather than competitive. Dewey would have been pleased with this social-relevance aspect of her theory.

Learning in Montessori's environment was a highly hands-on approach. Children rarely learned from the text; instead, they learned through activities. However, these activities were carefully prepared, designed, and constructed in specific ways (Wolfe, 2000). Even though Montessori's method was criticized for being too restrictive, people agreed that her children learned from direct experiences; and Montessori's teachers acted as facilitators like other progressive educationists. Saettler also reports (1990) that

Montessori also focused on helping children to become more independent learners who were less dependent on their teachers.

One of the most radical examples of Dewey's democracy school is the Summerhill School in England. When A. S. Neill founded Summerhill in 1921, his concern was "to make the school fit the child – instead of making the child fit the school" (Neill, 1960, p. 4). There were two distinctive features that made Summerhill stand out from other schools. First, at Summerhill, students made their own choices whether they wanted to go to classes or not. Believing in liberty, Neill wanted his students to learn how to be self-disciplined – the ability to make their own choices. This freedom, he claimed, would lead students to discover themselves, who they were and what were their interests were. Neill emphasized that education at Summerhill was to teach students to be happy with their freedom and their choices. He said that his primary job was not to reform the society, but to bring happiness to some of his students (p. 23).

Another distinctive feature was the general school meeting. At the meeting, school laws and rules were made. Students and adults had equal votes. Neill described that each member, regardless of his or her age, had one vote. The function of the meeting was not limited to making laws but to discussing the social life of the community as well. Neill maintained that the children's freedom was the most important component of his progressive school. He insisted that producing a successful citizen who was able to work joyfully and live positively in society rather than produce a compliant and reactive human being.

Thus, there were many sources from which Thai reformers could choose for the theoretical basis of the student-centered learning environment. These were some of the major influences at the time of the NEA Thai reform program. These theories are revisited in chapter five to propose relevant suggestions for improving Thai education reform, specifically in using instructional technology in the classroom.

Reviewing the literature on adult learning theory by Knowles, TPACK by Mishra and Koehler, and child-centered learning by Rousseau, Dewey, Montessori, and Neill provide the grounding for the challenges faced in the Thai Education Reform Act. For example, in teacher training, teachers are adults, and their learning would benefit from being designed to treat them as adult learners. In developing student-centered constructivist learning environments, teachers need to apply these approaches to active student learning, which is the hallmark of constructivism, to integrate technology resources into their lesson plans and teaching. Both of these needs conflict with traditional Thai teaching philosophy and practices. Thus, the response to these conflicts in implementing the reforms, would determine, to a large degree, their effectiveness. The results of this investigation into this challenge are reported in chapter four. In the next chapter, chapter three, the methods of investigation are described.

Chapter Three: Methodology

After ten years of the National Education Act 1999, there was a need to answer whether Thai teachers have optimized their use of information communications and technology in classrooms or not.

To address this study's three research questions, there was a need to collect data from a variety of sources, including interviews, locating and reading online documents, documents obtained through government agencies and other educational organizations, journalistic accounts and reviews, and scholarly journals. Books in both online and physical forms were also important sources of data for this research.

The process of Thai educational reform ran through the Ministry of Education, Office of Education Council, and other education-related organizations. The investment in the education budget during the reform had been relatively one-fourth of the government spending budget as reported in chapter one of this study. Underlying this support had been the assumption that the reform should have produced good results. This assumption was in response to various international ranking indicators as reported in chapter one.

One of the proposed outcomes of Thai education reform was to document the changes it proposed. However, in many cases, there were few or no records of trainings and workshops with teachers, and in others incomplete records. This made the job of collecting data more difficult, though not impossible. Both primary and secondary

sources were available and the historical research method was selected as the best way to approach and analyze the data sources.

Historical Research Method

This study used a historical research methodology. Historical research consists of content analysis and evaluating a series of events in a specific timeframe. Hopkins and Antes (1990) said, "The goal of historical research in education is to clarify present-day practices and problems by providing a historical knowledge base" (p. 222). It was an important goal of this study to situate Thai reform of teacher development within such a historical context.

Two sources were inspirational to the methods employed in this dissertation: Paul Saettler and David K. Wyatt. Saettler's 1990 comprehensive historical book *The evolution of American educational technology*, traced the theoretical and methodological foundations of educational technology. Moreover, he used the historical method to research data available as primary and secondary sources. Saettler's book covers the evolution and revolution of technologies applied to classrooms over a long historical period beginning with the Sophists in ancient Greece and continuing into the 20th century in recounting cases of educational film, radio, television, and various stages of computing until 1990. Based on his point of view, some relevant historical incidents, such as WW II, should be included, but do not have to be discussed comprehensively, to provide historical importance and to understand their relevance to educational history. The

parallel to this dissertation was the inclusion of the important contextual development of the Asian economic crises of 1997 and political instability in the country.

Wyatt (1969), the author of *The politics of reform in Thailand: Education in the reign of King Chulalonkorn*, was another historical writer whose work was based on exhaustive and comprehensive reading in Thai and foreign secondary sources. The bibliography includes both Thai and Western sources. Wyatt's work gives readers a new perspective of how Thai education developed closely with the political situation. In addition, historical documents, which Wyatt used in his book, were not easy for Thais to access, particularly when written by foreign writers. Wyatt's use of both western and Thai sources to produce a more comprehensive analysis served as a model for this dissertation.

These two books demonstrated both the method and the value of the historical research method. They provided a sound foundation for its use in this dissertation where the method was a thorough and disciplined research into all available sources and a subsequent analysis to construct the most authentic holistic picture, which in turn was its value.

Benefits and Drawbacks of a Historical Approach

Benefits: The historical research method helped to understand historical events. Two independent reports, *ONEC* (2001a) and *Thailand* (2007) found that Thais had accepted that their education system had not produced high quality students. The dissatisfaction with these findings fueled the educational reform effort that led to the

NEA of 1999. By investigating these account of past events and decision-making, the use of the historical research method helped this researcher to understand what the evolution and promulgation of Thai education reform.

The use of the historical method facilitated creating a larger, more holistic picture of what happened to the Thai education reform in the time period investigated (1999–2009). Conversely, research into more narrowly defined topics only resulted in limited insights into the impact of the NEA's reform effort. However, more narrowly focused reports were useful to this researcher as building blocks in constructing a more holistic picture of the effects of the Thai education reform act of 1999. What this study desired in the use of historical method was to see the whole picture as much as possible, not a limited or narrow one.

Drawbacks: A limitation faced in this research was that the records, documents, and other historical evidence of past events were often incomplete or not fully documented. In response to this limitation, the researcher reviewed over one hundred sources to fill in the gaps as fully as possible.

Historical research relies on examining closely both primary and secondary sources. It also makes possible the temptation to assess the records from one particular political point of view, thus, excluding the other perspective completely. Employing the discipline of the historical method helped the researcher to piece together a more objective account of the outcomes of the NEA and avoid taking or being influenced by the strong positions of competing political perspectives.

Data Sources

McDowell (2002) provides guidelines for classifying primary and secondary sources examined in the historical research provided in this dissertation. Primary sources were based on a written record at the specific time the events occurred. This included government publications and reports written by people at a particular place and time, or research studies produced by those who were present at the events. Secondary sources were mostly "written by people who were not present at the events which they described" (McDowell, 2002, p. 55). These sources included books and articles about the people and events under investigation, research papers, newspapers, and videos.

Selection of Data

This dissertation utilized two criteria to aid in the selection of data. First was that the source would relate to the evolution of the NEA and second was the relevance to training teachers as adult learners, in other words, adult learning theories. Data selected were categorized into two groups. The first group of the data was books and articles that have a description of learning theories relevant to the improvement of Thai teacher learning. Books and articles in this group mainly were from the Western point of view and focused on a wide range of educational theories. The second group of the data related to the evolution of the NEA and focused on a wide range of educational policies and reports. The data sources in this group ranged from books, government reports, journal articles, conference papers, dissertation studies, journalistic reports, and information from

websites that had descriptions of Thai education reform, the National Education Act of 1999, Thai teacher development, and the integration of technology into curriculum.

Summary of Data

A total of 105 sources were reviewed and analyzed for this dissertation. They were categorized into 41 physical books, 23 online books, 13 journal articles, 10 websites with relevant information, nine journalistic articles obtained from physical and online news sources, seven online articles and documents available from web searching but not attached to any journal, government, or news source, one dissertation, and one web blog.

There were 82 English and 23 Thai sources. The researcher bought physical books, borrowed them from libraries, obtained some when visiting the Office of the Education Council (OEC), and photocopies at the Thai National libraries, where it is not allowed to borrow books. The OEC was particularly valuable to the researcher because it was the source of government documentation of the actions taken as a result of the NEA. Online books and articles were files in portable document format (PDF), an electronic file format that provides an electronic image of text and graphics that looks like a printed document. Online books and articles in this study were publicly available for downloading from educational organizations, websites, research institutes, and relevant institutions. These sources were valuable because they were some of the only reports available and because they provided analysis of the effectiveness of the efforts to implement the provisions of the NEA. The researcher obtained journalistic articles from two major English style newspapers in Thailand, The Bangkok Post and The Nation, as

well as the online Thaipublica news source noted for straightforward reporting and consulted by the US Ambassador to Thailand (http://thaipublica.org/2013/02/kristi-kenney-u-s-ambassador-thaipublica). These English style newspapers were valuable because they tended to include more interviews, analysis, and background information than the typical Thai news sources consequently providing more in-depth information. In addition, most journal articles were retrieved from online databases through Boston University library subscriptions. Some journal articles were obtained through the Boston University Interlibrary Loan Services. Information from Websites utilized in this study was publicly available on the Web and there were no files available for downloading. This website information is provided in the reference section as http URL links. Website document category is similar to website information. However, some of these website document display information by having links to PDF documents. These documents were not online books, articles, journal articles, or journalistic articles. Instead, the content of these website documents were more on public relations type of documents, such as speeches.

Steps Taken Obtaining Data

There was no perfect formula for gathering data. However, the following were steps taken for gathering data by the researcher. Obtaining information in Thailand was smooth rather than rough when approaching the right source. This meant gathering information with an awareness of its cultural context and implications. When conducting interviews, for example, this would meant being polite and respectful of the interviewee's

position and seniority. When asking for information from a Thai citizen, this interviewer strived in every case to maintain a respectful and courteous demeanor. Otherwise, the request might not be granted or it might get delayed indefinitely.

When searching for information for this research study, two data sources were identified. First, relevant information – for example, documents on teacher training programs for using technology and for teachers to integrate technology into the classroom – were available at Thai educational agencies (MOE and OEC). Second, the same information and additional documents were available from the Internet as were many of the documents available at Thai educational agencies (MOE and OEC).

When researching government educational agencies in Thailand, most of the time, the first contact was not the right person. This meant spending time determining who was the right person, or a better informant, and then locating and making an appointment with him or her.

Another approach to obtain data was to contact the secretariat or public information office of related government educational agencies. These offices provided books and other information as well. In addition, these offices directed the researcher to contact the right person who was responsible for projects that related to this research study. This researcher kept in mind that when contacting people at educational agencies, the cultural context needed to be maintained of respectfulness and politeness. Throughout Thai government agencies, observing the proper etiquette remained highly important to getting through to people who knew about the implementation of the NEA and not having a request sit on a bureaucrat's desk for weeks or months, or perhaps indefinitely.

The advance of Internet technology opened up easy access to additional research information. Thai government educational agencies were already making use of this online technology. The problem, however, was that web design did not match what a reader might need, information often was not listed in a way that was easily accessible, and citation of sources was not always complete or accurate. These disadvantages were similar throughout the early design of Thai websites, such as those at SchoolNet in the early 2000s as discussed in chapter four.

Data Source Description

The Office of National Education Commission (ONEC) had been assigned responsibility for researching, implementing, and documenting the Thai education reforms. Local and international researchers did the research under the name of ONEC, which later changed the name and its administrative structure to the Office of the Education Council (OEC) in 2002 (ONEC, 2003b). Results of the study were published and posted on OEC's website: http://www.onec.go.th/onec_web/main.php

There were two major types of databases for this study. One type originated from inside Thailand, and the other type originated from outside Thailand. For the databases from inside Thailand, there were two main sources. The first was the Office of Education Council (OEC), or the Office of the National Education Commission (ONEC). The second database originating from inside Thailand was the Thai Library Integrated System (ThaiLIS), which is similar to ProQuest Dissertations and Theses. The ThaiLIS is a network of Thai university libraries that share Thai dissertations and theses in full text.

Access to a dissertation or thesis on the ThaiLIS is limited to Thai citizens only. The subscriber needs to use a Thai identification number to apply for a user ID and to access the database. The ThaiLIS was an extremely valuable resource for Thai educators, researchers, and citizens. Dissertations and theses on the ThaiLIS were searchable by both Thai and English keywords. However, English translation was available for the title and abstract sections only. However, obtaining a dissertation or thesis on the ThaiLIS was different from getting one on the ProQuest Dissertation and Theses. A dissertation or thesis, generally, was divided into many different files according to the structure of the work. For example, a section would be devoted to title page, approval pages, abstract, chapters, bibliography, and curriculum vitae. As a result, obtaining a dissertation or thesis, a subscriber must check and click many agreement boxes and download buttons.

Another important source for this dissertation research were government publications. The researcher obtained this information through physical books and online e-books via the National Library of Thailand, the Thai government websites such as MOE, NECTEC, and SchoolNet websites.

For the database outside Thailand, this study used ProQuest Dissertations and Theses as a main source to find dissertations written by Thai students in English. The aim was to investigate the relevant knowledge and research about Thai teacher professional development in using technology and student-centered in classroom.

In addition, the researcher used major online search engines as digital resources. Keywords employed in this research included: Thai education reform, history of Thai education, Thai national education act, Thai teacher development, information

technology or information and communications technology in Thai schools, constructivist learning theory, constructivism in Thai learning environment, Thai case study, Thai classroom culture, Thai teacher-centered teaching methodology, Thai student-centered learning, Thai technology and education reform, and Thai teacher use of information technology and media.

During the research, English and Thai keywords were used interchangeably. The Thai sources used in this research were published, presented, or publicly available on the Internet no earlier than 1995 and no later than April 2014.

Treatment of data.

The technique this research study used for analyzing and interpreting the datasets was the recursive abstraction. This technique was adapted from Martyn Polkinghorne and Amy Arnold (2014)'s *A six step guide to using recursive abstraction applied to the qualitative analysis of interview data*. The recursive abstraction approach used was the analytical method where datasets were summarized without coding. These summaries are further summarized. The final result was a more compact summary.

The full process of analysis adopted by this study can be split into six broad steps:

Step 1: Each item of data was read and highlighted, which could range from one word to partial sentences or phrases to whole sentences.

Step 2: These highlighted sentences and phrases were transferred and grouped to the research questions. This step was done in three Microsoft Word files that were organized by research questions.

Step 3: These sentences and phrases were then paraphrased. They were made more concise and manageable. At this step, the researcher was concerned not to change the meaning of the data.

Step 4: New themes were created when the data fit into more than one research questions. The new concise and manageable data from Step 3 were summarized and resulted in shifting some of the data from one question response to another.

Step 5: When data were categorized according to themes, the researcher analyzed and summarized the data to create a concise overview of the data.

Step 6: The researcher repeated Step 1 through 5 for each source.

A goal of this approach was to demonstrate that the researcher was careful to treat all data without bias. For this reason the method of recursive abstraction worked best.

Obstacles in Conducting Research

A fundamental assumption undergirding this study is that historical research must be viewed from the perspective of the sociopolitical backdrop against which events take place. In Thailand, the sociopolitical background of the period studied entailed a great deal of political instability. Over the ten-year period of education reform (1999–2009), there were many political and economic crises. One of these, the Asian Financial Crisis in 1997, was introduced in chapter one. While economic crises could be devastating to the

well-being of every Thai family, it was the political crises that were most disruptive of every Thai's life and well-being and whose effects were long lasting.

A major impact of the political instability in Thailand during the period examined was that many Thais found it very difficult to discuss the country's politics without bias. For example, when this researcher did a pilot study by interviewing Thai educators and administrators, focusing particularly on the changes in educational policy, respondents refused to answer the questions honestly because of not wanting to express the wrong view. Many people were afraid to be viewed as a critic or opponent of the government. Consequently, many Thais found it easier to simply say nothing rather than have their words be taken in a way that suggested disapproval of the political status quo. Research that relied solely on Thai responses to survey questions was fraught with difficulty regarding veracity and verifiability because they were encumbered by false and misleading answers or by no answers at all. Once again, it was the strength of historical research methodology that made possible a more critical approach to the interpretation of various sources.

Thus, by using a historical approach, this study did not depend upon the mere interaction between the researcher and survey or polling interviewees whose responses had a high probability of being strongly politically biased. Instead, the results of the historical methodology used in this study worked to prevent it from being tainted by any political biases. For this reason, the historical research methodology was appropriate for conducting this particular type of research project and sought to examine noncontroversial and unbiased primary and secondary sources.

Other obstacles in writing this dissertation related to the discontinuation of the Office of Education Reform, the Teacher Education Reform Office (TERO) and the world education reform website (http://worldedreform.com). According to Fry (2002) and Pillay (2002), TERO developed comprehensive and systematic plans for improving Thai teacher quality. However, because of the unclear ownership of the TERO project and the Asian economic crisis in 1997, these offices were dissolved with valuable recommendations and plans. This created the discontinuation of information, the disappearance of documents or original hosts, and many dead links on Thai education reform websites. Some of the secondary sources in this study had been collected before the dissertation writing began from the world education reform website. When these secondary sources were cited in the writing, the researcher sometimes had already referred to them in this study. However, when the researcher checked back on these links for references, the hypertext links sometimes stopped working or would not connect to their sources. The researcher found that the offices and the websites no longer existed. In some cases, these dead links showed up on web pages. Thus, they provided information verifying that there was information there in the past that no longer existed in the present. The researcher hoped in vain that these dead links would someday return from the dead.

The next chapter presents the findings of this research into the effectiveness of the NEA-inspired educational reforms.

Chapter Four: Findings

A review of the history of Thai education reform was helpful to understand the extent of Thai teacher professional development for the implementation of integrating technology into the curriculum during the ten years of Thai education reform. Findings in this chapter were based primarily on secondary sources. The focus of these data included government reports, research studies, and journalistic reports using on both Thai and English references. The first two questions involved a critique of Thai teacher professional development for using technology in classrooms. Then, following this critique, a series of recommendations were presented.

Findings Related to RQ 1: How Did the Implementation of the National Education Act of 1999 in Thailand Affect Thai Teacher Professional Development for Using Technology in Education?

Challenges in the formulation of constructivist learning theory in the NEA.

In reporting the findings of this dissertation research, it was important to recount the attempts Thais made to move forward with their reform principles, proposals, and plans as they had been presented heretofore, especially in such documents as the NEA, OEC, ONEC, the NIDTEP, and other reform proposals. The first point that emerges from this data is a description of how Thai reform efforts advanced student-centered and constructivist learning theories in their reform proposals. Critical evaluations that

appeared in various Thai media were also presented and analyzed for their contributions to understanding the NEA reform initiative.

The first question intended to learn if there was any change in teacher teaching practice after the implementation of the NEA or not. If there were changes, then this research question wanted to learn how Thai teachers handled the new teaching theory and practices in classroom.

How then should Thais have solved the teacher training problem in order to promote education reform as proposed in the NEA? Teacher quality was a problem throughout the reform period. During the transition to the Second Decade of Thai Education Reform (2009–2018), the Office of the Basic Education (OBEC), for the first time, organized a program of competency tests for teachers nationwide in order to improve teacher standards. The Minister of Education made a statement to the media that teachers sometimes failed exams in their own subjects ("Teachers fail exams," 2010). These frustrating test results revealed that the quality of Thai teachers needed vast improvement. For example, OBEC's test results showed that 88% of 3,973 computer-literacy teachers failed the computer-literacy test. The minister also said that almost 95% of about 37,500 school directors failed in areas such as information and computer technology and English. According to the minister, it was difficult to improve Thai education with such poor performance of Thai teachers. This broad number of ineffective teachers throughout the education system demonstrated the overwhelming need to study and evaluate Thai teacher development especially in relation to instructional technology's use in the classroom. However, the improvement of computing and English skills was

only the beginning of the development needed to bring Thai teachers into the 21st century.

Thai teacher and constructivist learning theory in the basic education environment.

New learning theories were not foreign to the NEA. Indeed, the OEC had hired Pillay (2002) to investigate how the NEA introduced new teaching and learning approaches to the Thai education system. He stressed the integration of technologies for education and the introduction of student-centered learning, both of which were new to Thai teachers and administrators. These new approaches were complex and confusing because Thai teachers and administrators had never been taught such innovations in the education environment. Pillay stated that the reform was implemented without any research and study of how these new approaches would work in the Thai education system. In the absence of such feasibility studies, the attempt to move forward with the implementation of reform programs was compromised from the very beginning insofar as the failure to incorporate any of these new learning theories.

The lack of preparation and careless implementation of student-centered learning were notable in the implementation of the reform act of 1999. Problems started to emerge as soon as the term "student-centered learning" was utilized. The English term "student-centered learning" was translated into Thai as the equivalent of "learning where the student is the center-middle" (Hallinger & Kantamara, 2001, pp. 401-402). In the early days of student-centered classrooms in Thailand, teachers asked students to do things as

simple as writing a paper based on their interests and submitting it at the end of the semester. Students, on the other hand, came to teachers and asked for further explanation, mainly because the stated guidelines were unclear. Teachers responded to students by stating that they could not give them any additional suggestions; otherwise, it would violate the student-centered concept. Students learned by trial and error, working on their own. This was why one of the primary-school students reflected her impression of student-centered learning by using the most insulting words in Thai. She called it "buffalo-learning – a form of learning from ignorance" (Kantamara, Hallinger & Jatiket, 2006, p. 8). This incident happened even though Hallinger and Kantamara (2001) reported that the official explanation of student-centered learning in the Thai language was equivalent to "learning where the student is important" (p. 402). This suggested that teacher trainings were not effective in introducing the concept of student-centered learning.

The new teaching and learning approaches required a change in philosophies and beliefs about a nature of how children learned (Pillay, 2002). Thai educators had few opportunities to gain access to student-centered pedagogy and resources. Most of the student-centered research was done from outside the country. This limitation created a large gap between the knowledge and the skills of both teachers and learners in the educational practices in Thailand. As opposed to the traditional classroom, teachers needed to understand their new roles. They needed to facilitate and construct subject content and to make it simple and enjoyable for students to learn. Most importantly, they needed to do this in the new context of constructivism (Mishra & Koehler, 2006).

What then was the manner in which Thai education reform was implemented despite the lack of knowledge about the role of new theories in achieving predictable outcomes? Several answers were evident.

In 2005, the OEC published a book about constructivist knowledge in the Thai education system: *Synthesis report of the knowledge on student-centered learning management during 1999–2004* (OEC, 2005). The book provided very comprehensive research on the definition of constructivism or student-centered learning, the desirable goals of the student-centered method, the importance of student-centered learning in the NEA, the strategic plans to implement student-centered learning in different class levels, the uses of technology to support student-centered learning, and findings and suggestions in using student-centered learning in the Thai education context (OEC, 2005). This book reported on the state of knowledge within the Thai reform community about student-centered learning but does not report on how to implement this new theory in the classroom.

This 2005 OEC book provided the research on training agencies that helped to encourage student-centered education. However, the research results revealed that the majority of the participants were administrators and not that many classroom teachers. Furthermore, the objectives of the training focused on explaining student-centered learning rather than on how to practice and develop its principles. It was interesting to note the finding that most of the trained teachers also did not share constructivist knowledge with other teachers after their training (OEC, 2005). Thus, there was a lag in the spread of the theory to a wider audience of teacher.

OEC (2005) reported that teachers, educators, administrators, and Thai people realized the importance of constructivist learning. They recognized that a constructivist classroom accommodated student development better than the traditional learning in many ways. However, they did not explain why student-centered classrooms were not widely used in the Thai education system. The study found that there were many obstacles preventing the adoption of constructivist classrooms.

In addition to their failure to train the right teachers, they did not provide enough training agencies to train the more than 600,000 in-service basic education teachers. As a result, the study found that teachers did not have enough constructivist knowledge and confidence to teach in a constructivist classroom environment. During the training, teachers had too few chances, if they had any, to develop their constructivist lesson plans and to practice in a student-centered teaching environment. Despite their training, these teachers were not familiar with selecting or creating educational materials that could initiate a student-centered environment (Whittier, 2011).

The 2005 OEC study also reported that creating a student-centered environment was not a top priority for Thai teachers. The same book reported that there was not enough motivation for teachers to switch to a student-centered classroom. The university entrance exam for students, at that time, admitted those who achieved high scores. For this reason, teachers thought they needed to teach to the tests, not for learning to learn. This was one of many reasons why Thai teachers were not enthusiastic about student-centered learning. It did not seem to meet the needs of students to score highly on these entrance exams (OEC, 2005).

According to an earlier ONEC document (1999a), there was a working group that visited and studied educational policies from different countries before drafting the NEA. In addition, reformers recognized that the philosophy behind the NEA had a student-centered focus, which contradicted the traditional Thai teacher-centered classroom tradition. One discernible difficulty was that the theory and the practice in the reform overlooked Thais' own knowledge and experience in the classroom. The educators and policymakers could not see how difficult it would be for the majority of Thai teachers, educators, and parents to adjust to a radically different system that the reform proposed. Preparation for and transitional time periods to make these pedagogical changes would surely be needed (ONEC, 1999a).

Adopting constructivist teaching methods would require a lot of unanticipated changes and additional local knowledge gained in the process of implementing the reform for Thai teachers to learn how to teach in a new teaching and learning environment. Thai teachers had never experienced such a learning environment before. While these teachers had to change their teaching practices with little preparation, the government, educators, parents, and media already blamed these teachers for not knowing how to implement the student-centered learning practices. By blaming the shortfall of the reform on the incompetency of teachers, the NEA failed to take into account and should have found out what teachers had to say about implementing the education reform by including teachers in the very design as well as in the implementation of proposed reforms as reported in Poolsup (2003).

It was obvious that recent Thai reformers interested in student-centered education

had been struggling with the process of change from traditional education to more democratic and constructivist schools.

Although the implementation of the reform had been closely monitored by several departments, organizations, and institutions, recent research related to Thai education reform showed only the most sluggish improvement in schools (OEC, 2006). In addition, official reports and media revealed the confusion teachers had about such concerns, for example, the philosophy, implementation of the timeframe, lack of training, uncertain politics, and conversion of policy into practice. While these difficulties in reforming education had been recognized by many Thai educators, then again it was Thai tradition that any new government programs would have rarely adhered to education policies from the previous government (Thaipublica, 2014). With a change in new government ministers, then the policies would also be changed to serve the politics and interests of the new regime. That the NEA was unmindful of this nexus between educational reform and changing political regimes went a long way towards showing once again that although its reform proposals had great merit in relation to constructivism or student-centered learning, its attempts at implementation fell short due to its inattention to what was happening politically and the limited amount of experience and knowledge Thai teachers brought with them to the reform table.

Even when a student-centered pedagogy had been applied, the Thai classroom environment was not yet transformed in a way that could support the change. Students need to be encouraged to experiment, discover, and present their findings, thus following the learning theories of Dewey, Rousseau, and Montessori, among others, upon which

constructivism was based. Yet, these resources were not ready and available for students to discover, especially for schools in remote areas (OEC, 2005).

The student-teacher relationship needed to change from a hierarchy to a partnership in learning (Prensky, 2010). However, Thai teachers feared that students might already know more than their teachers did. Students could have come up with questions that teachers might not be able to answer. Teachers were afraid that students might damage expensive equipment such as computers, monitors, and modems. As a result, teachers preferred to tone down student-centered learning in order to protect their own esteem and stature (Prpic & Kanjanapanyakom, 2004).

Although a change was needed and promoted by the reform act, Thai teachers were resistant to the changes and remained entrenched in old habits of thinking and methods of teaching. Here yet again was an impasse that the NEA could have resolved if it had been more circumspect in its analysis of the Thai education environment from the ground up rather than from the top down (Kantamara, Hallinger, & Jatiket, 2006). In effect, the NEA was as guilty of its own hierarchical approach as were the recalcitrant Thai teachers, who had boxed themselves into a corner without of any substantive change in teaching methodology. As discussed in chapter five, there were steps Thai reformers fail to take to ameliorate these disparities between reformers and Thai teachers, such as their neglect to implement adult learning theory.

Nakornthap (2004) also reported that Thai teacher development was slow because teachers were used to the way they had always taught, and the new teaching and learning pedagogies, introduced by the NEA, only brought them a great deal of confusion. This

state of confusion was one major reason why teachers found it difficult to implement change. The change went against the way they taught in new and unfamiliar ways and did not meet their needs to prepare their students for high stakes testing. Those old ways were entrenched and difficult to uproot and replace.

According to Nakornthap (2004), the National Institution for Development of Teachers, Faculty, Staff, and Educational Personnel (NIDTEP) was established in accordance with sections 52 and 55 of chapter seven, "Teachers, Faculty Staff, and Professional Development" of the NEA. The five years delay in establishing this institution caused uncertainty in teacher development efforts in the country. What these developments showed were how difficult it was to implement Thai education reform at the ground level. While planners were quite clear about the outcomes they desired, they were less clear about how to bring about those outcomes, thus leaving teachers confused about how to incorporate new reform goals and techniques into their classroom instruction. This study showed that the "failure to launch" was a repeated feature of Thai education reform of teacher development in using instructional technology in the classroom.

Thai teacher and cultural differences in constructivist classrooms.

In addition to difficulties relating to the new concepts of constructivism, student-centered learning, and resistance to teacher resistance to reform, Thai culture also set the context in which teachers and students would need to adapt in using information communications and technology (ICT). Pagram & Pagram (2006) reported that, "Thai

culture helps in the production of largely passive attitudes and behaviours [*sic*] among students" (p. 5). The structures of Thai society were centered on seniority, which was constructed by numerous developing relationships. Superior and inferior relationships were defined by implicit recognition of age, title, rank, status, position, or achievement. These relationships were implicitly instilled into all organizations and at all levels of Thai society. As a result, younger people were quiet, seldom disagreed, rarely expressed opinions, and did not ask questions in the presence of older people or, in this case, in the presence of teachers in their classrooms (Kantamara, Hallinger & Jatiket, 2006; Prpic & Kanjanapanyakom, 2004).

Prpic and Kanjanapanyakom's (2004) study offered some insights to the impact of Thai culture in Thai university classrooms. There were several ways to illustrate why students were passive learners. One was the relationship that occurred when the teachers were active and the students were passive, as was traditionally the case in Thailand. In a traditional Thai school environment, a good student recognized that teachers were senior and had greater knowledge. Good students had to be quiet, attentive, and pay close attention in class to all the knowledge and to the guidelines given by teachers. A good teacher had the image of being an expert and having all the answers in his or her related fields. Good teachers, in addition, had to organize the course content into appropriate learnable units and present the content clearly via lectures. They had to ensure that their students retained all the knowledge presented. If a student could not do well in the class by comprehensively retaining what the teacher had presented, it was not the teacher's fault. Instead, that student was labeled a bad student (Prpic & Kanjanapanyakom, 2004).

OEC (2006) found that teacher training practices were presented in traditional styles, which contrasted with the promotion of integrating technologies for a new constructivist classroom environment and student-centered learning. Pillay (2002) insisted that another one of the key cultural components that prevented the progress of the reform was language. He found that language barriers, especially between Thai and English content on the Internet, prevented teachers from accessing international literature in learning and teaching. Due to this limitation, he found that only a few teachers were competent with the new concepts of the reform because so much information about these concepts was still found only in English resources. The Ministry of Education and other related training organizations did not prepare for language translations and thus their occurrence was haphazard and not systematic. By the time Thai translations had come into existence, many opportunities related to the reform had already passed.

Thus, it becomes clear that there were many diverse and complex reasons why teachers resisted the new constructivist learning environment proposed by the NEA.

Even when attempts at implementation of reform were made, the outcomes were often disappointing. After the end of the pilot project, Wiratchai (2002), who obtained in-depth and focus group interviews from the 250 pilot school projects, reported in her initial findings that the trainings and workshops in those pilot schools did not bring significant changes to the schools. Although teachers had been in training and in workshops, Wiratchai reported that "most of the teachers still carried on the traditional way of instruction and assessment, emphasizing memorization rather than critical thinking" (p. 16). She also noted that, "the suggestions from authorities, sometimes, were

inconsistent and made them more confused. They did not see the linkage between their school's quality assurance and their duties of teaching and learning" (Wiratchai, 2002, p. 16). Therefore, while it was clearly admirable for reformers to reach out to the public schools to advance the cause of reform, nevertheless, their outreach often fell far short of their desired results. One goal of this current study is to suggest ways in which better outcomes might be possible for efforts related to teacher development in using instructional technology in the classroom. These are presented in chapter five.

Thai teacher and technology in constructivist classrooms.

The past experiences of teachers in using information technology, new models of instruction, and incorporating the Internet as a central teaching tool provided valuable lessons for future reform development. At first, to promote the use of the Internet in limited settings around the country, the *SchoolNet* project was introduced by the National Electronic and Computer Technology Center (NECTEC) in 1995. It introduced the computer and the Internet as new technologies for education in Thai classrooms for the first time. These new opportunities allowed Thai teachers to use the power of the Internet as an aid to education (Thajchayapong, 2003).

Unfortunately, at the beginning of the SchoolNet project, a majority of the teachers only had limited skills in blending technology into their classrooms and in guiding students to finding and using relevant educational resources. They were challenged because they had problems with reading the foreign-language content on most websites – particularly the English language – and in troubleshooting whenever problems

occurred during the use of such technology.

Beyond the difficulty posed by language, structural problems also hindered the extent to which teachers and students alike might be able to use instructional technology. While the SchoolNet project aimed to create equal access to information for remote schools, at the beginning of the project, many schools had to pay for the long distance access with fees, which were calculated by the minute, to connect to the Internet. At that time, most schools had only dial-up access, which was known for its unreliable connections. That meant that the number of computers in any one school that could connect to the Internet was limited, and the speed was extremely slow. Internet use also depended on how far schools were from local gateways. Faster broadband service was an extra expense that schools did not have in their meager budgets. Some schools did not even have a telephone line and consequently could not participate in the project at all. The NECTEC raised awareness about these problems and worked with providers such as the Telephone Organization of Thailand and the Communications Authority of Thailand to provide affordable Internet access for schools. Finally, schools that used dial-up had to pay per connection by dialing 1509.

This lack of accounting about the success of teacher training was also true in Thai teacher professional development. Later there were even broader attempts at implementing the use of instructional technology in the classroom. In 2004, the Office of the Education Council published a report called *Monitoring and evaluation report: An overview of learning, teacher, and education personnel reform in 2003 fiscal year*. In the report, 95,052 teachers and education personnel were projected to be trained at the end of

the 2003 fiscal year. These data were collected from all organizations that provided education, such as Ministry of Education, Ministry of Interior, Office of Education Council, and Bangkok Metropolitan Administration, until the end of the 2003 fiscal year. At the end of the fiscal year, the overall result was that 353,407 teachers and education personnel out of 600,000 teachers in the country had attended trainings for using instructional technology in their teaching. Although the number of teachers participating exceeded the number expected, OEC's report noted that there could have been duplications because only six training courses were available. Various teachers and educational could have taken the same course more than once. However, the OEC failed to keep records of who had enrolled in each course. So there was no way to know just how much duplication had taken place. Once again, it was apparent that the reformers were strong in their zeal for reform in training teachers how to use instructional technology, but also once again the manner of implementation caused their desires to be frustrated.

It would have helped if teachers could have broken with tradition by providing input on their needs and current level of knowledge and skills as the NEA wisely allowed schools to integrate local wisdom into their core curriculum. However, even in the pursuit of a constructivist goal for educational reform, those in charge reverted to a top-down teaching model when they provided actual teacher training.

This top-down model did not serve the teachers well because it overlooked the status of teachers as adult learners. More importantly, it overlooked the value of implementing constructivism not only as a teaching philosophy but also as the foundation

for teacher training. The result was unnecessary overlaps and contradictions that should have been accounted for by better workshop planning and record keeping.

Another issue was that implementation programs were sometimes ill-conceived. The Office of Education Council (2006) found that the teacher training was not well organized, and there were redundancy issues in the Thai teacher development system. When the MOE initiated teacher training programs all over the country, there were many teacher training groups and agencies involved. Unfortunately, the MOE did not receive a report of the course offerings by government and private training agencies (OEC, 2006). As a result, the MOE could not tell which courses worked well and which ones did not. It operated in the dark and could not plan strategically for the future by making effective and comprehensive teacher training programs.

In some cases, teacher development courses were redundant, which indicated the lack of communication between teacher training organizations and the MOE in working on Thai education reform. Furthermore, the OEC stated that Thai teacher professional development was underperforming and that there was a lack of innovation in the new reform program. The focus was on the content of the trainings rather than using the student-centered pedagogy to teacher the teachers, which was the framework behind the reform (OEC, 2006).

After nine years of the reform, OEC (2009b) reported that the development of Information and Communications Technology (ICT) in education achieved more on upgrading ICT equipment rather than on developing teachers to use technologies for their curriculum. There was little use of technologies for education among teachers and for

lifelong learning among students when programs for their implementation lagged behind or never got off the ground (OEC, 2009b).

Sometimes a sustained attempt was made to gauge the success of the students who used instructional technology remotely. Pagram & Pagram (2006) examined Thai e-learning issues and found that most websites were designed in such a way that they reflected traditional teaching and learning. These instructional websites were good at being sources of information, which were good for students who were only looking for information. On the other hand, Pagram & Pagram (2006) found that there were problems with the user interface and with excessive use of unnecessary interactive graphics, animation, flashy icons, video clips, or sounds. It was obvious that the design of these webpages did not have students as users in mind. They also reported that these interactivities had little to do with the instruction on the webpages. In addition, some of these instructional websites required users to install plugins, which required a certain level of computer literacy. These poor design features made the Web resources difficult for students to use and prevented students from effectively using technologies as an educational tool (Pagram & Pagram, 2006).

Unfortunately, according to Pillay (2002), participating teachers also had to learn about and practice new approaches based on their own previous experience, skills, and interpretations. The bottom-up approach, through which teachers could integrate local knowledge that suited their local environment, was one of the new features that Thai teachers needed to acquire during the planning of the new reform curriculum. Pillay was concerned that teachers and administrators, especially from schools in remote areas,

could misinterpret this objective in the reform practices they were being taught. He urged that, to make this model successful, “key principles of the new practices” (p. 13) needed to be introduced through teacher training first.

Fry (2002) found that Thai teachers themselves were inadequately trained to use technology in the classroom. Teaching had been the most difficult task in the Thai learning environment due to the lack of digital resources and help from technology-literate experts. Even though numerous agencies had provided training courses, they only happened in the first year of implementing the pilot project, which did not provide enough time or information for teachers to be comfortable using technology in their classrooms.

The findings of this dissertation research were many and highly significant in terms of any future reform of teacher development in the use of instructional technology in the classroom. Issues as broad as entrenched teaching philosophies and practices and cultural and structural limitations in the Thai educational environment all suggested a deep irony wherein Thai hopes for reform were promulgated only to be subsequently dashed by failures to take into sufficient account the local Thai culture in which Thai teachers had traditionally taught. While change was as difficult for Thai teachers as it would be for any teacher adapting to new teaching innovations, their transition from an authoritarian model to a more constructivist one and their adoption of a more student-centered teaching methodology rather than the prevalent teacher-centered one could have been facilitated by the right set of supplemental strategies and workshops. This study proposes just such a set of revisions and new strategies in the next chapter.

Findings Related to RQ 2: How Did Researchers and Journalists Evaluate the Effects of Thai Education Reform Recommendations on Teacher Training for Using Technology in Education During 1999–2009?

Challenges in the implementation of educational reform in the NEA.

The reformers did not merely lay out principles, procedures, proposals, and plans. They also attempted to test the feasibility of their reform program. In addition to a critique of the limitations in Thai reform efforts to adopt a constructivist learning environment, this research project also examined the limited efforts Thais made to put into place broad educational reforms in the classroom. Thus, Thai reformers faced challenges in the implementation of reform as well as in the formulation of reform.

There were experiments with the new teaching and learning concepts with 250 pilot schools around the country. The pilot schools project came from a collaboration among the Ministry of Education (MOE), the Office of the National Education Commission (ONEC), the Asian Development Bank (ADB) along with educational institutions and universities, local researchers, teacher educators, teacher supervisors, and nonprofit organizers. This project aimed to experiment with providing a whole-school learning reform using constructivist teaching. In addition, the government would provide new tools and technology for these pilot schools and additional teachers to support this new teaching and learning environment. Projects included such things as wiring schools and installing telephone lines and modems. Training teachers to use these resources, however, was only vaguely emphasized (Amornvivat, 2002). According to Piya-Ajariya

(2002), the objectives of the project were to improve the quality of students, to experiment with new teaching and learning practices, and to serve as a prototype that Thai educators could learn from.

Atagi (2002) said that usually a pilot project served as a test model for how good something was. Usually, this test phase would run one to two years. However, Thais spent nine months on the pilot school project. Meanwhile, the Malaysia's Smart School project and Singapore's first phase of the ICT Masterplan for Education spent three and five years respectively ("Policy on ICT," n.d.; "Speech opening address," 2008). It was too difficult for Thai teachers, educators, and students to understand new concepts of constructivist pedagogy and to integrate technology into the curriculum. This limitation, Atagi reported, yielded too little data to improve the reform plan. Teachers were not convinced to change their teaching practice from the traditional classroom to a constructivist classroom.

Wiratchai (2002) reported that after the national pilot project (January–October 2001), these 250 schools were expected to extend the new teaching and learning practices to other schools in their local areas as well as create a network of reform throughout the country. However, beyond the pilot schools project, students, teachers, school administrators, and parents, all of whom who were not involved in the pilot project, were confused about what the new teaching and learning practices had been proposed and would take effect. This confusion led to uncertainty and resistance for some teachers who had little input into reform policies. As a result, the first ten years of Thai education reform did not reach its expected goals as reported by Thai media in an article titled:

Education system ills setting up future failure (Bangkok Post, 2013). This report referred to the study of the Thai Research and Development Institute (TDRI). The study said that funding was no longer the problem for Thai education. The Thai government had invested around 25 percent of government spending on education and 20 percent throughout the remainder of the reform period. On the other hand, TDRI concluded that the lack of an accountability system caused the relative failure of the NEA-inspired reform. Teachers still got paid higher salaries and kept their jobs even if most students failed their tests (TDRI, 2012). The TDRI reported that there were no education administrations responsible for the low performance of Thai education. There was no penalty nor were there any additional resources made available to help schools doing poorly on whatever tests by which they were evaluated.

An article titled *Educators want urgent reform* (Intathep, 2012) reported on a project called the Learning Curve conducted by The Economist Intelligence Unit. This unit had studied and analyzed school-system performance in a global context and reported that Thai education ranked 37th of 40 countries studied. It urged leading Thai educators to request that the government "…take concrete action to reform Thailand's education system after the country was ranked near the bottom in a recent global report." The article reported that the MOE was well aware of the country's low education ranking and its unworkable educational reform practices. There was, however, no clear implementation plan to improve the performance of Thai education system even with the second phase of Thai education reform already started in 2009.

The Nation newspaper published a scathing editorial section *So much revision,*

but Thai education system still failing (October, 2012). The author remarked that an education "minister's tenure is often short-lived" ("So much revision," 2012). Because the political changes were so frequent, this article said that Thai national education policy was "going nowhere amid this lack of consistency, direction and long-term vision." The article insisted that "the problem is that every new minister comes up with a new set of policies." It asked for a long-term goal to improve the national education system and streamline the standards of all schools ("So much revision," 2012). This editorial article was consistent with the earlier study by an UNESCO publication in 2004: *Integrating ICTs into education: Lessons learned*. This study said that Thai administrators could not coordinate and communicate effectively both within and outside the MOE. This was due to frequent staff transfers (UNESCO, 2004).

Another report, *Tests give low marks to Thai education standards* (Khaopa, 2010), reported on an interview with Sompong Jitradab, a lecturer at Chulalongkorn University's Faculty of Education and member of the education reform policy committee. He said that "the national tests reflected that Thailand had failed to improve its education quality." In the meantime, he complained that government officers were not brave enough to initiate useful ideas for the country. Instead, they were waiting for politicians to issue new policies, which constantly changed when there were new elections and new appointments of educational leaders. The article urged that the laws related to education be made more stable and continuous (Khaopa, 2010).

Another Bangkok Post article led with the headline that *School heads lack English, ICT skills: Poor survey showing surprises authorities* ("School heads

lack,"2010). The article said that the Office of the Basic Education Commission (OBEC) asked Srinakharinwirot University to test about 40,000 school directors and deputy directors under its jurisdiction. According to the article, there were tests for administrative knowledge, leadership, English, and information and communications technology (ICT). The results showed that these school executives were poor at English and ICT skills despite having master's degrees. The OBEC declined to reveal the numbers about how poor they were. The OBEC planned to hire the education faculty of Chulalongkorn University to develop courses to improve these directors and deputy directors ("School heads lack," 2010).

It was expected that the digital library project would be a positive and expansive resource for Thai students ("Thailand: SchoolNet digital," n.d.). However, at the time of this writing, the content of the digital library was static without any updates ("Digital library for SchoolNet," n.d.). Unfortunately, there was no organization to carry out the continuous creation of Thai-language digital library content.

Findings related to RQ 3: What Were Lessons Learned and Further Recommendations for Improving Thai Teacher Professional Development for Integrating Technology into Education that Resulted from the Implementation of the National Education Act of 1999 in Thailand?

Lessons learned.

Education reform is complex and multifaceted and consequently takes time. It

was too soon in 2002 to say that education reform had failed in Thailand because in many ways, it had only just begun. However, these early attempts at reform were inadequate in significant ways. For example, the Ministry of Education failed to spend more time running the pilot schools project and expanding the project to cover more school populations over the first five years (1999–2004). The results from the first five years did not succeed in evaluation for planning purposes. For instance, it did not focus on the development of in-service teachers, new teacher education, administrative oversight, and the practice of teaching in a student-centered learning environment. The results did not make use of the other areas of improvement such as the design of curricula, the admission system, restructuring the law, and founding new institutions that supported the sustainability of future reform.

The second five years (2005–2009) were in part dedicated to making the adjustments in the teacher curriculum. Teachers needed to become familiar with a new pedagogical model for teaching and implementation of the reform of schools nationwide. After ten years, the reform did not build awareness of new pedagogy among Thai teacher or within the Thai population. The results were not solid and proven, because the teachers were not involved in the reform process from the very beginning. Such a collaborative type of reform in Thai education failed to bring about unity, direction, efficiency, and broader benefits to the Thai community as a whole. These were definitely some of the things the reform proposals did not accomplish that would have made for a greater degree of progress countrywide.

In chapter two of this study, Western authors suggested that adult students were different from children as learners (Knowles, 1984a; Lindeman, 1961; Tough, 1979), and Thai teachers were adult learners, who were treated as children when they encountered teacher development programs sponsored by the government (Pillay, 2002). The government took the role of the expert authority and simply handed down education policy to the teachers as if they themselves were passive and unengaged students in a typical Thai classroom. The adult learners in the Thai teacher development situation were subjected to the hierarchical methodology used to teach them, so they had no involvement in the learning process. In addition, the teachers of adult learners did not know how to teach teachers as adult students. Instead, as Pillay (2002) reported, the focus was rarely on well-established principles of teaching adult learners and was instead focused on the results – the final grades, the consolidation of the administrative structure, and adherence to education law.

In addition, both local and foreign researchers and consultants had insisted that education for Thai teachers needed to be updated and upgraded both in terms of a higher quality and a more appropriate pedagogy (Atagi, 2011; Pillay, 2002). The second decade of Thai education reform recognized that teacher development was very important and proposed a curriculum for Thai teacher development that suggested what Thai teachers *ought to do* in order to reach the goals of teacher reform but failed to suggest *how* these goals might be implemented. For example, the Office of the Education Council (OEC) proposed having trainings and workshops as means of teacher development. But the method of delivering content for these trainings and workshops failed to recognize the

importance of teachers in an adult learning situation. It failed to state *how to do* things that made for effective learning for adult teacher development. Importantly, follow-up and evaluation after a workshop and training program were not effectively implemented as Amornvivat (2002) found. Even the tracking of who took which courses and the tallying of the variety of course topics fell through the cracks when such data would have clearly facilitated future reform efforts, enabling an assessment of what did and did not work. As stated by Moore & Kearsley (1996), adults like to participate in their learning and to include their own experience.

Consequently, there were structural issues that needed to be resolved in Thai education reform, there were also issues involving the nature of information technology itself. First of all, technology was viewed as a panacea for all educational problems. Additionally, the mere presence of technology was viewed as creating educational change. This, of course, is an assumption that has been disproven many times (Saettler, 1990; Cuban, 1986).

Three problems in Thai education reform programs were presented in chapter four. These problems were an outdated pedagogy, an unrealistic faith in the power of technology, and conflicting cultural differences. In Appendix A, this research study proposes a workshop model to facilitate adopting TPACK as a framework for solving the cultural hurdle in education reform problems.

Three of the major problems in Thai education reform originated with teachers. First, teachers misunderstood the technical terms; for example, the meaning of the student-centered approach or constructivist theory misled and confused teachers. They

had no background through which to perceive this as active learning and often misinterpreted the idea to mean that they should not guide the students but rather should leave them to their own devices as reported by Atagi (2002) and Kantamara, Hallinger & Jatiket, (2006). Second, teachers thought that merely having computers would help them by saving valuable time, consequently providing them with more free hours. Instead, it turned out that computer technology gave them much less free time and was more difficult to implement in classroom effectively. As a result, teachers wondered why technology in the classrooms was necessary or desirable. Using chalk-and-talk techniques would be more comfortable and appropriate for big, loud, and crowded classrooms. And third, if the new concepts of teaching allowed students to ask questions, interrupting the lectures, correcting mistakes, or adding to the content, teachers felt that the reform would impair rather than improve teaching and learning. These objections were reasonable in light of the limitations of Thai teacher knowledge, training and culture at that time.

Conclusion

This study found that while the reform efforts through 2009 and beyond did indeed envision new and forward-thinking methods for teacher development in using instructional technology, there were several critical implementation practices where the reform efforts fell short. This was particularly the case in terms of the recognition of the value of constructivist approaches to learning and of a student-centered method of teaching. For example, what the reform act failed to do was to follow through with the very innovations it had proposed in ways that could have made it possible for Thai

teachers and students to let go of the top-down method of teaching that had been predominant in Thailand for so long.

The recommendations that follow in chapter five provide further response to research question three with appropriate discussion. They also follow from the findings of this investigation and are proposed as a corrective to the blind spots regarding teacher in the first decade of the NEA-inspired education reform efforts in Thailand.

Chapter Five: Discussion and Recommendations

Having shown the extent to which Thai education reform made significant advances in proposing the use of modern learning theories such as constructivism in their proposals, and having shown how often these very proposals were not effectively implemented, this research then turned towards making appropriate recommendations addressing the blind spots and short falls in the first decade of the NEA reform programs.

After the first ten years of the reform, there was no concrete evidence that teachers were ready to conduct classrooms in the new teaching and learning environment described in the relevant chapters of the NEA (Fry & Bi, 2013; OEC, 2009a). The first ten years of Thai education reform did not reach the expected goals. The findings of the present study provide an understanding of what had not yet been accomplished in the Thai teaching and learning environment. By noting the shortfalls of the Thai reform found in this study, those interested in education reform and the use of modern educational and informational media will have more data and analysis with which to formulate an implementation of education reform for helping teachers to use technology. Thai educators and policy planners will have a vastly different perspective that will expand their understanding of the role of teachers and the goal of modernized Thai classroom practices.

By documenting the shortcomings in the implementation of the NEA, this study hoped to initiate some debate and discussion about the professional needs of teachers that would increase awareness about the future implementation of reform plans, especially for

training teachers to incorporate media and technology into lesson plans more effectively. The omissions and shortfalls described in this study about the limitations of the NEA in implementing instructional technology into the classroom will help Thai educators and scholars to make meaningful decisions regarding the next phrase of education reform. For example, this study held that a place to start for future discussion of the advancement of teacher training would be the Second Decade of Thai Education Reform (2009–2018) and the One Tablet per Child program, initiated in 2012. Starting here makes it possible to plan for the future use of instructional technology in the education environment.

This study now provides specific recommendations to improve the reform process. Thai education reform would not have been a complete success unless Thai educators reversed the long-established tradition of teachers as the sole source of authority and adopted it with a student-centered method of teaching that was more appropriate for the world of information technology and more consistent with the practices of constructivism in education, which the reform intended to implement.

It was a challenging period in Thailand during the late 1990s. At that time, many crises, for example, Thailand's decline in several global competitiveness, underperforming human resource development, economic crises, and political upheavals precipitated the reform. Based on only a small number of schools that participated in the National Pilot Schools project, research findings showed positive results, for example, in the implementation of the objectives of the reform, in the impact of the reform on teachers and students, and in increased levels of school performance reported by Wiratchai (2002) and Piya-Ajariya (2002). Later, the Ministry of Education decided to

initiate nationwide education reform, which failed to involve teacher input in the implementation phase.

What makes the focus on teacher development so important is that teachers were the bridge between the education system and the practice of teaching (National Commission on Teaching and America's Future, 1996). The first decade of reform used traditional training for preparing new teachers and improving existing teachers' knowledge and skills to comply with the requirements of the recent reform. This emphasis on traditional professional development continues to impact all areas of the Thai education system. Thus, the forward movement in the NEA towards broader teacher constructivist knowledge and integrating skills in using instructional technology was a crucial area of concern for this research.

Presenting a New Training Concept for Improving Thai Teachers Using Technology in Classroom

To remedy the failures of the NEA, this research pointed to an ultimate need for a suitable teacher-training workshop model. This researcher designed a workshop, called the *Learning and Technology Empowerment Workshop* that combined the theory of adult learning with the TPACK framework. Presented in appendix A, the purpose of this workshop, first, was to encourage Thai teachers to transition from the traditional way of teaching in classroom. Moreover, literature suggested that the quality of teachers had a positive effect on schools and students. As the National Commission on Teaching & America's Future (1996) pointed out:

> What teachers know and can do makes the crucial difference in what children learn. And the ways school systems organize their work makes a big difference in what teachers can accomplish. New courses, tests, and curriculum reforms can be important starting points, but they are meaningless if teachers cannot use them productively. Policies can improve schools only if the people in them are armed with the knowledge, skills, and supports they need. Student learning in this country will improve only when we focus our efforts on improving teaching. (p. 5)

Second, when education reform started in late 1999, it was assumed by the Thai Ministry of Education that teacher training was a panacea for numerous challenges during this transition. To support the rapid changes in teaching and learning, a large number of teachers were needed to be continuously upgraded. In addition, a new generation of teachers who were capable of teaching in the new learning environment needed to be effectively prepared (Pillay, 2002). These trainings and new generation of teachers would not improve Thai education's situation unless the Ministry of Education was open to new ways of training and teaching adult learners, especially recognizing from the start that teaching and training teachers meant viewing them throughout as adult learners capable of participating in their own learning processes.

Third, hiring both international and local researchers to study the current educational situation in Thailand was one of several attempts to improve its education system. Suggestions and recommendations based on these attempts were made and carried out by the Thai Ministry of Education in the first education reform. However, the

Thai government admitted that the first reform failed (OEC, 2009a). Despite the fact that one-fourth of the national budget was for education, Thai educational performances had been subpar in many indicators, both national and international testing, throughout the reform. *The Proposals for the Second Decade of Education Reform (2009–2018)* was carefully planned. In fact, teacher quality development was one of the top three main goals to achieve by 2018 (OEC, 2009a). The workshop proposed in this study is one that offers an alternative learning approach to model proposed by the Office of the Education Council. The agenda of the workshop would be one of self-discovery and would involve collaborative working-group learning. It would increase the probability of improving Thai teachers as by treating them as adult learners who would then, in turn, be better able to set up and implement constructivist style classrooms using technology.

Fourth, because teacher performance was influenced by administration and management, teacher development was very top-down and authoritative. Therefore, for their own liberation and involvement, teachers must now participate more on their own development, and educational leaders ought to facilitate that by crafting clear teacher-empowerment objectives.

Last, this proposed workshop aims to promote independent learners and critical thinkers, and offers powerful learning opportunities to teachers. To make meaningful learning, the proposed workshop stresses teacher development that would provide time and tools for adult learners to practice and to integrate their knowledge of their students' needs and abilities into their new constructivist style lesson plans. In this way, the content of the development would be derived from adult learning needs. Consequently, teachers

would have experience in the learner-centered approach and would know which approach would be more effective for teaching their students.

Recent literature on Thai teacher training and development showed that the adult learning theory, the self-directed learning concept, and the TPACK framework had not existed previously in Thai adult education. These theories and framework provided the best answer for Thai teacher development in the twenty-first century learning environment, and the introduction of this self-directed knowledge offered a powerful and positive alternative way of teaching adults how to teach children. The more we understand about how adult teachers learn, the better we will design curricula to fit students' needs.

The prospect of using an adult learning model for Thai teacher development is not a guarantee of success. At the very least, however, this model would identify some characteristics of adult learners that deserved attention and might prove to be fruitful. Most important, the introduction of adult learning theory and the TPACK framework would give Thai educators an awareness of how to improve teacher development for the future.

These then are five recommendations this study proposed based on the historical research and content analysis found in the previous chapters. These suggestions and recommendations might generate a new discussion on how to move forward more effectively and successfully with Thai teacher development for using instructional technology in the classroom. Only time will tell whether Thai educators, administrators, government officials, and members of the community will heed this advice or whether it

will later fade from view. However, history strongly suggests that considering Thai teacher training and preparation from the perspectives of adult learning theory and the TPACK classroom framework for the use of technology would provide much positive benefit to Thai teachers and students as they strive to enable Thailand to compete competently in the new world economy by utilizing the world-changing capacity of information technology. A plan for introducing these changes in teacher professional development in Thailand is presented in Appendix A.

Appendix A

A Solution-based Learning and Technology Empowerment Workshop Level II

This is a seven-day intensive workshop. It is part of the Learning and Technology Empowerment course. This is the Learning Technology Empowerment Workshop Level II (LTEW II), which is designed for intermediate teachers-learners. There are two other levels: the Learning and Technology Empowerment Workshop Level I and III, which were designed for a beginner and for advanced teacher-learners respectively.

For the purposes of this dissertation, only the level II workshop is presented because it is most appropriate for the most majority of Thai teachers. Level I and Level III will be developed as needed. The level II workshop is designed for in-service teachers who seek answers to solve a real-world problem. Teachers who participate in this training are encouraged to share their own experiences for discussions with their colleagues. Training will be *just in time* learning style, where problems are from individuals' real situations. With this training style, information and instruction are provided when learners need it. Learners will benefit by learning to solve problems collaboratively. The goal of this workshop is not to master the content. Instead, the objective of this workshop is to help in-service teachers to discover adult-centered learning for themselves and to transform new learning strategies into a student-centered learning environment, to be able to use computer and related technology to facilitate active rather than passive learners, and to be able to teach under the new teaching requirement of the Thai second decade of education reform.

Knowles' *andragogical process design* (Knowles, 1984b) was borrowed and adjusted to suit the Thai learning culture and environment. To optimize the training results, the instruction of this workshop was planned to continue for seven days in boot-camp style. The weekend in the middle of the workshop allowed participants to work in groups, catch up on the assigned projects, and practice in the online-learning environment. It allowed time for participants to experience, perhaps for the first time, self-development as well.

Requirements

A. Participant requirement.

Teachers who are eligible to apply for the LTEW II had to pass one teacher training as Level I Teacher Technologists. Prior to acceptance into the Level II training, a recommendation letter is required from their principals. In addition, the potential teacher technologists has to submit a completed application with two required sections. The first section is to gather participants' general information. The second section requires the participants to write an instructional technology plan, which is used for evaluating teachers on how they plan to integrate technology into instruction. These applications are reviewed and selected by committee.

Participants would receive 40 hours of staff development, 6 hours of online learning, and 4 hours of an independent online assignment. Because participants stay together for the remaining 7 days of training, they spend their time off in discussions with each other about their work so far and their assignments.

B. Requirements for the instructional technology plan.

While the first section of the application package focuses on collecting general information on the participants, the second section, the instructional technology plan, is used to determine the eligibility of the prospective participants. The guidelines of the plan include:

1. Need assessment – address what kind of instructional technology is needed for the classroom in his or her school;
2. Statement of the problem – state what the problems are and why technology is needed in the classroom;
3. A lesson plan – how prospective teachers would integrate technology into the curriculum;
4. Available resources – explain existing technological equipment, funding, and existing instructional technology plan;
5. Needed resources – describe what was needed to improve instructional technology in the classroom; and
6. Evaluation plan – explain what methodology would be used to evaluate the implementation plan.

In addition, the objectives described in agenda are served as a means of:

- determining instructional technology literacy of the participants;
- planning and customizing the curriculum of the workshop for participants' needs; and,
- pretesting of how teachers perceived technology as in educational tool.

Participating in the Workshop

Each in-service teacher who is chosen to participate in this workshop will receive a laptop computer and software to use in his or her classroom. During the workshop, teachers would be divided into small groups. On the final day of the workshop, participants, as a group, would formally present the technology-based curriculum project they develop to share with other technology-using teachers. Shortly after the workshop, these projects would be made available online for other teachers who subscribe to the mailing list and for the next training labs' purposes.

The environment of the Learning and Technology Empowerment Workshop

This workshop is a self-discovery and work-in-group workshop. The agenda of the workshop is based on adult learning theory and TPACK learning environments. Throughout the workshop, the instruction strategies are based on adult-centered learning, that is, 1) group work; 2) prior personal interest; 3) active learners; and, 4) hands-on experiences.

Based on a review of the literature on professional development, the training methodology for the LTEW II is a combination partly of the adult learning process and the TPACK learning environment. These learning processes are:

1. Developing a climate that is conducive for adult learners – physical surroundings and interpersonal relations such as meeting with facilitators as part of a circular configuration, creating a collegial classroom climate so that new learning could take place in a positive, collaborative way.

2. Identification of individual and group needs – instruction that help the group or individuals move toward the goals of their projects, so that those goals would be incorporated into their learning situation.
3. Transforming educational objectives to the learner experiences and to instructional technology – following Knowles and Koehler & Mishra, workshop participants developed skills – for example, group discussion, simulations, problem-solving activities based on their authentic pedagogical problems. Applying a TPACK framework, participants would relate educational objectives and seek ways to connect the use of technology, researching and analyzing subject matter, and the means of teaching so that students actively developed the skills they need as 21st century learners.
4. Flexible content, opportunities for exploration to learn something new, and on-site support – even though the workshop is intentionally designed to run six hours per day, it has a built-in flexibility that would allow for one or two extra hours at the end of the workshop. These extra hours would leave room for learners to try new things or to work on solving previous problems, and if needed, would allow time for both emotional and technical support to reduce frustration.
5. Collaborative learning and team teaching – participants would work in groups that allow them to share their unique experience, teach one another, and build knowledge for particular group's project, so that the workshop would be relevant to participants' experience. Meanwhile, facilitators would help other participants follow the training sequence and bring them back on course when they become

lost. Furthermore, these facilitators would facilitate participants active learning rather than giving out lessons as directions on what they should do.

6. Evaluating learning – the purpose of evaluation is to stimulate growth and improvement on the group project. There are several methods and many opportunities for obtaining assessments from participants, for example, informal discussion in groups, sharing opinion, and feelings. These projects would be satisfied when participants had a general consensus about their group project and could transfer their learning into lesson plans that would be relevant to their own needs.

Agenda

This is up to a seven-and-a-half-hour-a-day schedule. This also included a 2-day weekend schedule. Each day has 3 hours for reviewing topics and 2 hours for completing online assignments.

Date	Time	Activities
Wednesday	8:30 – 9:30 a.m.	Registration and Breakfast
	9:30 – 10:30 a.m.	Pretest
	10:30 a.m. – 11:00 a.m.	Introduction, welcome, and presentation
	11:00 a.m. – 12:00 p.m.	Ice-breaking activities Breaking into groups Introduction of group facilitators Selecting group leaders

	12:00 – 1:00 p.m.	Lunch
	1:00 – 2:30 p.m.	Introduce adult learning theory
	2:30 – 3:00 p.m.	Break
	3:00 – 4:30 p.m.	Come back in as a group Open discussion about adult learner characteristics
	4:30 p.m.– 5:00 p.m.	Q & A
Thursday	8:30 – 10:00 a.m.	Introduce the concept of TPACK
	10:00 – 10:30 a.m.	Break
	10:30 – noon	Introduce Google Sites and Google Documents product – an application for building a lesson plan and using an online word processor, spreadsheet, and presentation editor
	12:00 – 1:00 lunch	Lunch
	1:00 – 2:30 p.m.	Presentation: Sample of a Google Sites Work in groups: self-explored Google Sites and Google Documents web application
	2:30 – 3:00 p.m.	Break
	3:00 – 4:30 p.m.	Work in groups: self-explored Google Sites and Google Documents Incorporate project proposal to Google Sites or Google Documents
	4:30 – 5:00 p.m.	Q & A
Friday	8:30 – 10:00 a.m.	Work in progress: presenting proposal (3 groups - each group has 30 minutes for presenting and getting feedback: first 3 groups in the first half morning)
	10:00 – 10:30 a.m.	Break
	10:30 – noon	Work in progress: continue presentation from

		the last 2 groups (each group has 30 minutes for presentation and getting feedback) Discussion
	12:00 – 1:00 pm	Lunch
	1:00 – 2:30 p.m.	Work in progress: incorporate feedback into proposal using the Google Sites and Google Documents online applications
	2:30 – 3:00 p.m.	Break
	3:00 – 4:30 p.m.	Reflections on the revised projects from group facilitators with suggestions and instructions for next steps
	4:30 – 5:00 p.m.	Q & A: get together and ask questions or sharing experiences for the whole group Questionnaires
Saturday	3 hours	Self-learning materials: TPACK Working as a group either online or face-to-face
	2 hours	Writing assignment – TPACK
Sunday	3 hours	Self-learning material: Review of adult learning theories online Working as a group either online or face-to-face
	2 hours	Writing assignment – adult learning theories
Monday	8:30 – 12:00 a.m.	Small group workshop – participants attend small group workshops according to their interests
	12:00 – 1:00 p.m.	Lunch
	1:00 – 4:30 p.m.	Work-in-progress: finalizing the projects Schedule for technical help to individuals and groups
	4:30 – 5:00 p.m.	Q & A - get together and ask questions or sharing experiences for whole group

Tuesday	8:30 – 10:00 a.m.	Summary presentation – 3 groups (30 minutes each) both 2 sections in the morning
	10:00 – 10:30 a.m.	Break
	10:30 – noon	Summary presentation – 2 groups (30 minutes each) Discussion
	12:00 – 1:00 pm	Lunch
	1:00 – 2:30 p.m.	Post test
	2:30 – 3:00 p.m.	Conclusion
	3:00 – 5:00 p.m.	Discussion Feedback and evaluation from participants.

Wednesday, Day 1

Morning session

Session objectives: At the end of this morning session, participants would be able to:

1. Indicate major themes of the second decade education reform (SDER) (2009–2018); and
2. Identify key success factors of teacher development to the SDER.

Activities:

1. Pretest – to measure pre-existing knowledge in instructional technology and to measure knowledge on Teacher Technologist Level I. The results of the pretest would be used for adjusting the training curriculum.
2. Welcoming message – address how this workshop would help advance the SDER and explain the objectives of the workshop.
3. Presentation – on the teacher as a facilitator, self-directed learner, and as a curriculum developer; these elements would be the key to the success of the SDER.
4. Ice-breaking activities – teachers would introduce themselves, their hometowns, institutions, and then divide into groups.
5. Introduce group facilitators
6. Select group leaders.

Afternoon session

Session objectives: At the end of this afternoon session, participants would be able to explain and discuss the characteristics of adult learner.

Activities:

1. Presentation and discussion on adult learning theory and its impact on adult learners.
2. As a group, participants would establish a common goal of the group project – encourage cooperative planning and develop needs assessment through team-based learning.
3. Teachers would be encouraged to discuss and give feedback with their group members about the characteristics of adult learning.
4. Facilitators would introduce group members to individual and group assignments, which are required at the end of this workshop, that is, writing assignments as individual tasks and project proposals and an online of the curriculum as group projects.

Side notes

At the end of the day, the results from individual and group learning objectives would be used as an additional pretest – what teachers know before the workshop begins. First day's assignment would be used as an instrument to measure and compare what they had gained after the workshop.

Thursday, Day 2

Morning session

Learning Objectives: At the end of this morning session, participants would be able to:

1. Explain and discuss the TPACK framework and

2. Use basic commands and work on the Google Sites and Google Documents Web applications.

Activities:

1. Introduction and the presentation on TPACK
2. Introduction of Google Documents products – Text documents, Spreadsheets, Presentations, Drawings, and PDF files that enables group member to create, collaborate, and share documents online instantly and simultaneously. They would have developed hands-on experience as well as time for self-exploration to explore Google products.
3. Facilitators would encourage group members to implement their project proposals with Google Documents.

<u>Afternoon session</u>

Learning objectives: At the end of this afternoon session, participants should be able to:

1. Gain more experience and confidence on using Google products;
2. Write need assessment; and
3. Create and share project proposals on the web.

Activities:

1. Participants would have more time to explore Google products. In this given time, it is expected that facilitators would see participants learn and work in groups, because at the end of this session they would have uploaded their project proposal on to website.

2. Thirty minutes before the end of the day, participants are encouraged to discuss the topics they had learned and to suggest what they need to learn as extra topics for the following days.

Friday, Day 3

Morning session

Session objectives: At the end of this morning session, participants would be able to:

1. Compare and contrast the concepts, ideas, and theories behind group presentation activity; and
2. Learn, adapt, and construct a better website presentation.

Activities:

1. Three groups would present in the first half of the morning session.
2. Two groups would present in the second half of the morning session.
3. The workshop leader would encourage discussion.

Afternoon session

Session objectives: At the end of this afternoon session, participants would be able to:

1. Improve group presentations; and
2. Apply appropriate Google Sites and Google Documents features to group projects.

Activities

1. After the morning presentation, participants would get together and improve their work. They would be encouraged to work on their own computers to edit shared

document on Google Sites and Google Documents Web applications.

2. In case there is any technical problem, each participant would be encouraged to learn from their peers. If the problems were unsolvable, facilitators would come in. Facilitators instructed to give advice and guidance to solve any problems with the participants, but not to fix the problems without working together in groups. In the meantime, facilitators would give inspiration to their group members by encouraging them to try some new features on Google Site and Google Documents.
3. At the end of the day, facilitators would distribute a survey for participants' learning needs. This survey would ask about software that was related and needed in order to help participants work on their projects.

Saturday, Day 4

Weekend learning activities

Objectives of the day: At the end of the day, participants would be able to:

1. Recognize and construct learning activities that have TPACK framework embedded;
2. Use the Internet as a research tool; and
3. Use the Internet as a communication and collaboration tool.

Activities: During the weekend, learning activities would be divided into 3 learning styles: 1) self-studying, 2) working in groups, and 3) online assignment.

1. Today's topic is to review the basic of and to do research on TPACK framework. As individual, participants are assigned to write an essay: "How to apply the TPACK framework to their own classroom situation?" browsing TPACK Web sites allow them to gain broader international experience through online research. Relevant links would be provided.
2. After studying TPACK, participants work on their group projects. They will be encouraged to work together via online sharing of Web space – Google Sites and Google Documents.
3. Participants submit writing assignment on TPACK online by 6 p.m.
4. Facilitators available online if needed.

Side notes

There would be many possible things that participants could learn while creating a group project including: editing photos, editing video, and editing sound clips, and learning keyboard shortcut for each application.

Sunday, Day 5

Weekend learning activities

Objectives of the day: At the end of the day, participants would be able to:

1. Analyze, compare, and contrast adult learning theory;
2. Use the Internet as a research tool; and
3. Use the Internet as a communication tool.

Activities: During the weekend, learning activities would be divided into 3 learning styles: 1) self-studying; 2) working in groups; and 3) online assignment.

1. Today's topic is to review and to do research on adult learning theory. As individuals, participants are assigned to write an essay: "Which aspect of learning theory or the framework of adult learning theory will help you improve education in your classroom and how?" Participants are encouraged to do online research. Searching for adult learning theory websites allows them to gain broader international experience on the topic. Relevant links would be provided.
2. Getting into groups, either online or in face-to-face meetings, among the group members, facilitators would encourage group discussion and compare and contrast adult learners between Western and Eastern points of view. Participants need to submit an online assignment by 6 p.m.
3. Working in groups: participants need to work on their group projects – especially on instructional design.
4. Help available online by facilitators if needed.

Monday, Day 6

Morning session

Session objectives: At the end of this morning session, participants would be able to:

1. Implement new software skills to their works; and
2. Achieve their learning needs from their group projects.

Activities:

1. Small Group workshop – This is more of a technical application gathered from the early surveys on Day 3. The topics for Small Group workshop are from the most demanding top three topics on the survey list. This workshop would be held in three different rooms in informal and recurring styles. Participants could join these groups according to their learning needs and interests. In addition, facilitators would provide participants sufficient time to practice until they feel confident to work on their own.

Afternoon session

Session objectives: At the end of this afternoon session, participants would be able to improve group work by applying appropriate techniques that they had learned from the Small Group workshop.

Activities

1. Participants work in groups to improve their group projects.
2. Scheduled technical help. Facilitators would be available for help and support. Participants could spend extra time on problems that they had problems with.

Tuesday, Day 7

Morning session

Session objectives: At the end of this morning session, participants would be able to:

1. Discuss the meaning of adult learning theory and the TPACK framework behind the design from other group projects; and
2. Compare, contrast, and advise alternative way of improving group projects.

Activities:

1. Summary presentation from 5 groups.
2. Discuss and feedback from all participants.

Afternoon session

Session objectives: None

Activities

1. Posttest: the result would be used to compare with the pretest at the beginning of the workshop.
2. Conclusion and discussion of what participants would have learned, how they could have used it, and a summary of adult learning theory and of TPACK.
3. Participants fill out a short survey – improvement of the next workshop.

After immersing themselves in TPACK-infused lesson plans and in an adult-centered learning environment, the participating teachers will now be ready to utilize effectively technology in the classroom and to adopt a constructivist pedagogy while using it. As Saettler (1990) recommended, the development of educational reform must not emphasize media alone or rely excessively on hardware. Instead it must enable teachers to grow in knowledge and skills by using educational technology and then integrating it into classroom processes. After the introduction of this workshop, Thai teacher development will focus more primarily on teaching teachers how to work with technology rather than merely focusing only on their learning how to use technology, the key error Thais made in the past.

References

Ainley, J., Arthur, P., Macklin, P. & Rigby, B. (2001). Thai Learning Technologies 2010, Bangkok: Office of the National Education Commission.

Amornvivat, S. (2002, June). *Learning process reform of the pilot schools: The selected models*. Document presenting at the Meeting on Multiplication of the Outcomes of Learning Process Reform Project on learning reform schools for developing quality of learners. Retrieved from http://www.onec.go.th/onec_web/page.php?mod=Book&file=view&itemId=34

Atagi, R. (2002). *The Thailand education reform project: School reform policy.* (Final Report No. ADB TA 3585-THA). Retrieved from http://www.sermwit.ac.th/cms/kbs/ebook/pdf/4501901/pdf.pdf

Atagi, R. (2011). *Secondary teacher policy research in Asia: Secondary teachers in Thailand.* Bangkok, Thailand: UNESCO Bangkok. Retrieve from http://www.uis.unesco.org/Library/Documents/secondary-teacher-policy-research-asia-thailand-education-2011-en.pdf

Brooks, J. G. and Brook, M. G. (1999). *In Search of Understanding: The case for constructivist classrooms*. Alexandria, VA, Association for Supervision and Curriculum Development.

Cuban, L. (1986). *Teachers and machines: The classroom use of technology since 1920*. New York: Teachers College Press.

Dewey, J. (1964). The school and social progress. In R. D. Archambault (ed.), *John Dewey on education: Selected writings* (pp. 295-310). Chicago: Random House, Inc.

Digital library for SchoolNet Thailand. (n.d.). Retrieved from http://www.school.net.th/library/index-dl-ver01.html

Education reforms must continue. (2007, February 28). *The Nation*. Retrieved from http://nationmultimedia.com/2007/02/24/opinion/opinion_30027763.php

Education system ills setting up future failure. (2013, March 27). *Bangkok Post*. Retrieved from http://www.bangkokpost.com/opinion/opinion/342521/education-system-ills-setting-up-future-failure

Fry, G. W. (1999). *Teaching personnel strategy in Thailand: A review and recommendations* (Project TA2996-THA). Prepared for UNESCO-Bangkok as part of the Asian Development Bank Social Program Loan in the framework of the Educational Management and Finance Study, Vol. II/1, Bangkok: UNESCO. Retrieved from http://www2.unescobkk.org/elib/publications/1999EDU_Finance_Thailand/v22.pdf

Fry, G. W. (2002). *Synthesis report: From crisis to opportunity: The challenges of educational reform in Thailand* (Publication No. TA 3585-THA). The Asian Development Bank. Bangkok, Thailand: Office of the National Education Commission.

Fry, G. W., & Bi, H. (2013). The evolution of educational reform in Thailand: The Thai educational paradox. *Journal of Educational Administration, 51*(3), 290-319. doi: 10.1108109578231311311483

Hallinger, P. & Kantamara, P. (2001). Exploring the cultural context of school improvement in Thailand. *School Effectiveness and School Improvement, 12*(4), 385-408.

Harris, J. B. (2008). Handbook of technological pedagogical content knowledge (TPCK) for educators. In American Association of Colleges for Teacher Education (Ed.), *TPCK in in-service education: Assisting experienced teachers' "planned improvisations"* (p. 251-271). New York, NY: Routledge.

Hopkins, C. D., & Antes, R. L. (1990). Chapter 9: Historical inquiry. In *Educational research: A structure for inquiry* (3rd ed., pp. 222-237). Itasca, Ill.: F.E. Peacock Publishers.

Intathep, L. (2012, November 29). Educators want urgent reform. *Bangkok Post.* Retrieved from http://www.bangkokpost.com/news/local/323603/educators-want-urgent-reform

Kantamara, P., Hallinger, P., & Jatiket, M. (2006). Scaling-up educational reform in Thailand: Context, collaboration, networks, and change. *Planning and Changing, 37*(1-2), 5-23. Retrieved from http://eric.ed.gov/?id=EJ756213

Ketudat, S. (2002). **จากอดีตและปัจจุบัน สู่อนาคตของการปฏิรูปการศึกษาไทย: สู่สังคมแห่งปัญญาและการเรียนรู้** [Looking to the future of Thai educational reform through the lens of its past and present: In search of knowledge and learning community]. Special

lecture for Five Decades of the Office of the National Education Commission at the ESCAP Hall Conference Center, UNESCO, February 16, 2002. Bangkok, Thailand. Retrieved from http://www.onec.go.th/onec_backoffice/uploads/Book/48-file.pdf

Khaopa, W. (2010, December 29). Tests give low marks to Thai education standards. *The Nation.* Retrieved from http://www.nationmultimedia.com/2010/12/29/national/Tests-give-low-marks-to-Thai-education-standards-30145416.html

Kiattananan, P., & Koanantakool, T. (n.d.). SchoolNet Thailand: An information infrastructure for the future of Thailand. Retrieved from http://www.nectec.or.th/schoolnet/articles/schoolnet_paper.html

Knowles, M. S. (1970). *The modern practice of adult education: Andragogy versus pedagogy*. New York: Association Press.

Knowles, M. S. (1975). *Self-directed learning: A guide for learners and teachers*. New York, NY: Association Press.

Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy* (2nd ed.). New York: Cambridge Books.

Knowles, M. S. (1984a). *The adult learners: A neglected species* (3rd ed.). Houston, TX: Gulf Pub. Co.

Knowles, M. S. (1984b). *Andragogy in action*. San Francisco: Jossey-Bass Inc.

Knowles, M. S. (1989). *The making of an adult educator: An autobiographical journey*. San Francisco, CA: Jossey-Bass.

Koehler, M. J., & Mishra, P. (2005). Teachers learning technology by design. *Journal of Computing in Teacher Education*, *21*(3), 94-102.

Koehler, M. J., & Mishra, P. (2008). Handbook of Technological Pedagogical Content Knowledge (TPCK) for Educators. In *What is technological pedagogical content knowledge (TPCK)?* (pp. 3-58). New York, NY: Routledge.

Lindeman, E. C. (1961). *The meaning of adult education.* Montreal: Harvest House.

Locations. (n.d.). *admin*. Retrieved from http://www.mscmalaysia.my/locations_cyber

McDowell, W. H. (2002). *Historical research: A guide*. London: Longman.

Merriam, S. B., Caffarella, R. S., & Baumgartner, L. M. (2007). *Learning in adulthood: A comprehensive guide* (3rd ed.). San Francisco: Jossey-Bass.

Miller, M., Lu, M. Y., & Thammetar, T., (2004). The Residual impact of information technology exportation on Thai higher education. *Educational Technology Research & Development*, *52*(1), 92-96. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=pbh&AN=13716416&site=ehost-live&scope=site

Ministry of Education. (2001). *Development of education in Thailand*. International conference on education, Geneva. Retrieved from http://unesdoc.unesco.org/ulis/cgi-bin/ulis.pl?catno=173184&set=4CEB5696_3_209&gp=1&lin=1&ll= 1

Ministry of Information and Communication Technology (n.d.) *About Us*. Retrieved from http://www.mict.go.th/view/10/About%20Us

Mishra, P., & Koehler, M. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, *108*(6), 1017-1054. doi: 10.1111/j.1467-9620.2006.00684.x

Montessori, M. (1912). *Montessori method: Scientific pedagogy as applied to children education in "The children houses" with additions and revisions by the author*. (A. E. George, Trans.) NY: Frederick A. Stokes Company.

Moore, M. G. & Kearsley, G. (1996). *Distance education: A systems view*. Belmont, CA: Wadsworth.

Nakornthap, A. (2004). **รายงานสภาวะการศึกษาไทยต่อประชาชน ปี** 2546: **ผ่าปมปฏิรูป** [Thai educational status report 2003: The analysis of Thai educational reform]. Bangkok, Thailand: Parppim.

National Commission on Teaching and America's Future. (1996). *What matters most: Teaching for America's future: report of the National Commission on Teaching & America's Future.* New York: Author. Retrieved from http://nctaf.org/wp-content/uploads/2012/01/WhatMattersMost.pdf

National Economic and Social Development Board (n.d.). *The Eight National Economic and Social Development Plan (1997-2001)*. Retrieved from http://eng.nesdb.go.th/Default.aspx?tabid=402

National Information Technology Committee Secretariat (2003). *Information Technology Policy Framework 2001-2010: Thailand vision towards a knowledge-based economy*. Bangkok, Thailand: Author.

Neill, A. S. (1960). *Summerhill: A radical approach to child rearing*. NY, Pocket Books

Nitungkorn, S. (2001). Higher education reform in Thailand. *Southeast Asian Studies, 38* (4), 461-480. Retrieved from http://hdl.handle.net/2433/56762

ONEC urges academic coupon for secondary teacher development project. (1997, November 14). *RYT9.com*. Retrieved from http://www.ryt9.com/s/prg/186843

Office for Educational Technology Development Fund (2011, December, 13). **ความเป็นมาและความสำคัญของกองทุน** [The history and significance of the fund]. Retrieved from http://www.moe.go.th/edtechfund/fund/index.php?option=com_content&view=article&id=32&Itemid=16

Office of the Education Council (2004a). *Education in Thailand 2004.* Bangkok, Thailand: Amarin Printing and Publishing.

Office of the Education Council (2004b). **รายงานการติดตามและประเมินผล: การปฏิรูปการเรียนรู้ ครู คณาจารย์ และบุคลากรทางการศึกษา ภาพรวม ปีงบประมาณ** 2546 [Monitoring and evaluation report: An overview of learning, teacher, and education personnel reform in 2003 fiscal year]. Bangkok, Thailand: Parppim.

Office of the Education Council (2005). **รายงานการวิจัย การสังเคราะห์องค์ความรู้เกี่ยวกับการจัดการเรียนรู้ที่เน้นผู้เรียนเป็นสำคัญ ตั้งแต่ พ.ศ.** 2542-2547 (ฉบับสมบูรณ์) [Synthesis report of the knowledge on student-centered learning management during 1999–2004 (Unabridged edition)]. Bangkok, Thailand: Agricultural Cooperative Federation of Thailand.

Office of the Education Council (2006). รายงานการติดตามและประเมินความก้าวหน้า การปฏิรูปการศึกษาด้านการเรียนรู้ เมื่อสิ้นสุดปีงบประมาณ 2548 [Monitoring and evaluation report of learning reform at the end of 2005 fiscal year]. Bangkok, Thailand: 21 Century Ltd.

Office of the Education Council (2009a). *Proposals for the second decade of education reform (2009-2018)*. Bangkok, Thailand: Prig Wan Graphic Co. Ltd.

Office of the Education Council (2009b). สรุปผลการดำเนินงาน 9 ปี ของการปฏิรูปการศึกษา พ.ศ. 2542 - 2551 [A summary on the outcomes of the nine years education reform during 1999 and 2008]. Bangkok, Thailand: VTC Communication Ltd.

Office of the Education Council (2013, June). *Teacher policy*. Paper presented at the International Conference on Education 2013: Education for our future. Bangkok, Thailand. Retrieved from http://www.onec.go.th/onec_backoffice/uploaded/Outstand/2013-07-05-cfdFullEn009.pdf

Office of the National Education Commission (n.d.). การวิจัยเอกสาร เรื่องนโยบายการผลิตและพัฒนาครู [Documentary research on teacher education and professional development policy]. Retrieved from http://www.ptcn.ac.th/ebook/pdf/4212007/pdf.pdf

Office of the National Education Commission (1999a). *National Education Act of B.E. 2542 (1999).* Retrieved from

http://planipolis.iiep.unesco.org/upload/Thailand/Thailand_Education_Act_1999.pdf

Office of the National Education Commission (1999b). *Education in Thailand 1999*. Retrieved from http://www.onec.go.th/onec_backoffice/uploads/Book/730-file.pdf

Office of the National Education Commission (2001a). **ความสามารถในการแข่งขันด้านการศึกษาของประเทศไทย ปี** 2544 [Thai education competitiveness in 2001]. Retrieved from http://www.onec.go.th/onec_backoffice/uploads/Book/744-file.pdf

Office of the National Education Commission (2001b). **รายงานสภาวะการศึกษาไทย ปี** 2543/2544: **ปฏิรูปการศึกษาอย่างไร เพื่อใคร เพื่ออะไร**? [Thai education status report in 2000-2001: An answer to the educational reform's how to, for whom, and for what questions]. Bangkok, Thailand: Parppim.

Office of the National Education Commission (2002a). *National Education Act of B.E. 2542 (1999) and Amendments (Second National Education Act B.E. 2545 (2002))*. Retrieved from http://www.onesqa.or.th/en/publication/nation_edbook.pdf

Office of the National Education Commission (2002b). **สกศ. กับการพัฒนาการศึกษาไทย** [Roles and Responsibilities of the Office of Education Council in Thai education development]. Retrieved from http://www.onec.go.th/onec_backoffice/uploads/Book/50-file.pdf

Office of the National Education Commission (2002c). *Final report on the first international forum on education reform: Experience of selected countries*. Bangkok, Thailand: Author.

Office of the National Education Commission (2003a). *Education in Thailand 2002/2003*. Bangkok, Thailand: Amarin Printing and Publishing.

Office of the National Education Commission (2003b). **สภาการศึกษา จากอดีตถึงปัจจุบัน สู่มิติใหม่ในการพัฒนานโยบายการศึกษาของชาติในอนาคต** [Office of the Education Council: From the past to the present to a new dimensions in the development of national education policy in the future]. Bangkok, Thailand.

Pagram, P., & Pagram, J. (2006). Issues in e-learning: A Thai case study. *The Electronic Journal of Information Systems in Developing Countries, 26*(6), 1-8. Retrieved from https://www.ejisdc.org/ojs2/index.php/ejisdc/article/view/276

Pansawat, S. (2003). 5000 **โรงเรียนนำร่อง** SchoolNet **ก้าวจากเนคเทคสู่กระทรวงเสมา** [SchoolNet project in 5,000 pilot schools: A governing transition from NECTEC to Ministry of Education]. *Sarn NECTEC, 10*(52), 6-20. Retrieved from http://www.nectec.or.th/schoolnet/farewell/shoolnet2.pdf

Prensky, M. (2010). *Teaching digital natives: partnering for real learning*. Thousand Oaks, Calif.: Corwin.

Pillay, H. (2002). Teacher development for quality learning: The Thailand education reform project. (Report No. ADB TA 3585 – THA). Retrieved from http://www.onec.go.th/onec_backoffice/uploads/Book/569-file.pdf

Piya-Ajariya, L. (2002). *Learning reform situation in the pilot schools: Lessons and policy recommendations*. Bangkok, Thailand: Office of the National Education Commission. Retrieved from http://www.onec.go.th/onec_backoffice/uploads/Book/31-file.pdf

Policy. (n.d.). *UNESCO Office in Bangkok*. Retrieved from http://www.unescobkk.org/?id=496

Policy on ICT in education Malaysia (n.d.). Retrieved from http://www.mscmalaysia.my/sites/default/files/pdf/publications_references/Policy on ICT in Education Malaysia 2010.pdf

Polkinghorne, M., & Arnold, A. (2014). *A six step guide to using recursive abstraction applied to the qualitative analysis of interview data*. Poole, England: Bournemouth University. Retrieved from http://eprints.bournemouth.ac.uk/21055/1/ISBN 978-1-85899-296-9.pdf

Pongwat, A., & Rupavijetra, P. (2011). The problematique of quality education in Thailand: Material/quantitative vs abstract/qualitative. In *Africa-Asia university dialogue for educational development report of the international experience sharing seminar (1): Efforts toward improving the quality of education.* Retrieved from http://aadcice.hiroshima-u.ac.jp/e/publications/sosho4_1-10.pdf

Poolsup, S. (2003). *Educational politics in Thailand: A case of the 1999 National Education Act* (Doctoral dissertation). Retrieved from http://commons.emich.edu/theses

Profile. (n.d.). *Ministry of Education*. Retrieved March 25, 2014, from http://www.moe.go.th/moe/th/profile/index.php

Prpic, J. K., & Kanjanapanyakom, R. (2004, July). The impact of cultural values and norms on higher education in Thailand. In *Proceedings of the Higher Education Research and Development Society of Australasia (HERDSA) Conference* (pp. 4-7).

Pundit, B. (2013, March 28). Why it will be difficult to reform Thailand's education sector [Web log message]. Retrieved from http://asiancorrespondent.com/103445/why-it-will-be-difficult-to-reform-thailands-education-sector/

Re-engineering in Thailand. (1997, October 11). The Economist, 345, 83-84. Retrieved November 5, 2013, from the ProQuest Business Collection database.

Rousseau, J. J. (1979). *Emile or On education*, (A. Bloom, Trans.). New York: Basic Books (Original work published 1762).

Royal Thai Government Gazette, (2010). **พระราชบัญญัติการศึกษาแห่งชาติ พ.ศ**. 2542 **แก้ไขเพิ่มเติม** (**ฉบับที่** 2) **พ.ศ**. 2545 **และ** (**ฉบับที่** 3) **พ.ศ**. 2553 [The National Education Act of B.E. 2542 and Amendments (No.2) B.E. 2545 and (No.3) B.E. 2553]. Retrieved from The Cabinet and the Government Printing Office website: http://www.ratchakitcha.soc.go.th/DATA/PDF/2553/A/045/1.PDF

Sangnapaboworn, W. (2005). *Education reform in Thailand during 1999–2004: Success, failure, and political economy of the implementation* (Grant-in-Aid for Scientific

Research (FY 2005-2007) of the Japan Society for the Promotion of Science). Nagoya, Japan: Nagoya University.

Saettler, P. (1990). *The evolution of American educational technology.* Englewood, Colorado: Libraries Unlimited, Inc.

School heads lack English, ICT skills. (2010, June 7). Bangkok Post. Retrieved from http://www.bangkokpost.com/learning/education-features/38312/school-heads-lack-english-ict-skills

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review, 57*(1), 1-22.

Siribannapitak, P. (2003). **รายงานการวิจัยเพื่อพัฒนานโยบายและแผนการปฏิรูปการผลิตและการพัฒนาครู คณาจารย์ และบุคลากรทางการศึกษา** [A research report on a development of policies and procedures for teacher education and professional development]. Bangkok, Thailand: Pimdee Co.

Sixth National Training Workshop for Teacher Educators. (n.d.). *UNESCO Office in Bangkok: Sixth National Workshop - Thailand*. Retrieved from http://www.unescobkk.org/education/ict/ict-in-education-projects/training-of-teachers/training-of-teachers-and-facilitators/training-workshops-for-educators/educators-workshop-thailand/

So much revision, but Thai education system still failing. (2012, October 10). *The Nation*. Retrieved from http://www.nationmultimedia.com/opinion/So-much-revision-but-Thai-education-system-still-f-30191630.html

Song, L. & Hill, J. R. (2007). A conceptual model for understanding self-directed learning in online environments. *Journal of Interactive Online Learning*, *6*(1), 27-42. Retrieved from http://www.ncolr.org/jiol/issues/PDF/6.1.3.pdf

Speeches Opening Address by Dr Ng Eng Hen at the International Conference on Teaching and Learning with Technology (iCTLT). (2008, August 5). *Ministry of Education, Singapore*. Retrieved from http://www.moe.gov.sg/media/speeches/2008/08/05/opening-address-by-dr-ng-eng-h-1.php

Tangchuang, P. (2010). Credentialism and the diploma disease in higher education. In A. Mounier & P. Tangchuang (Eds.), *Education and knowledge in Thailand: The quality controversy.* Chiang Mai, Thailand: Silkworm Books.

Teachers fail exams on own subjects: Nationwide OBEC test results ring alarm bells (2010, June 8). *Bangkok Post.* Retrieved from http://www.bangkokpost.com/learning/education-features/38353/teachers-fail-exams-on-own-subjects

Thailand: SchoolNet digital library awards 2546. (n.d.). Retrieved from http://www.nectec.or.th/schoolnet/library/webcontest2003/overview.html

Thailand (2007). In M. Amadio (Ed.), *World data on education 2006-07* (6th ed.). Retrieved from http://www.ibe.unesco.org/Countries/WDE/2006/ASIA_and_the_PACIFIC/Thailand/Thailand.pdf

Thai Research and Development Institute (2012, February). การปฏิรูปการศึกษารอบใหม่: สู่การศึกษาที่มีคุณภาพอย่างทั่วถึง [*The new round of education reform: To the quality of education for all*]. Paper presented at the annual academic conference 2554 Revamping Thai education system: quality for all, Bangkok, Thailand. Retrieved from http://tdri.or.th/wp-content/uploads/2012/10/s1_ammar.pdf

Thaipublica (2012). การศึกษาไทย ใช้งบประมาณมากที่สุด แต่ผลลัพธ์ตรงกันข้าม [Thai education: Most of the budget, but the results are opposite]. Retrieved from http://thaipublica.org/2012/08/critical-study-of-thailand-1

Thaipublica (2014). เมื่อกระทรวงศึกษาธิการเปลี่ยนรัฐมนตรีบ่อย 16 ปี 15 คน [When the Minister of Education change ministers frequently, 15 in 16 years]. Retrieved from http://thaipublica.org/2014/01/the-performance-period-of-the-minister-of-education/

Thajchayapong, Phairuch (2003). คำกล่าวรายงาน การดำเนินงานโครงการเครือข่ายคอมพิวเตอนร์เพื่อโรงเรียนไทย (SchoolNet Thailand) เนื่องในงานแถลงข่าวพิธีลงนามบันทึกข้อตกลงการส่งมอบโครงการฯ จากกระทรวงวิทยาศาสตร์และเทคโนโลยีให้แก่กระทรวงศึกษาธิการ ณ ห้องประชุมกระทรวงศึกษาธิการ กระทรวงศึกษาธิการ กรุงเทพฯ [A statement of the operation of the SchoolNet Thailand project in the signing of a memorandum ceremony of an agreement to transfer the project from Ministry of Science and Technology to Ministry of Education]. Retrieved from http://www.nectec.or.th/schoolnet/farewell/Speech_SchoolNetCeremony.pdf

Tough, A. (1979). *Adult's learning projects: A fresh approach to theory and practice in adult learning.* Ontario: Pfeiffer & Co.

UNESCO. (2004). *Integrating ICTs into education: Lessons learned*. Bangkok, Thailand: UNESCO Asia and Pacific Regional Bureau for Education. Retrieved from http://unesdoc.unesco.org/images/0013/001355/135562e.pdf

Vajarodaya, K. (2004). The Wang Klaikangwon school, Hua Hin model: Moving ahead together through distance education: the way forward. *International Journal of the Computer, the Internet and Management. 12*(2), 1-3. Retrieved from http://www.au.ac.th/cide/research/elearning_conference_2004/eLearningAP2004/eLearning%20proceedings/pdf/p1-3-Khwankeo%20%20Vajarodaya-DLF_keynote%20address.pdf

Waitayangkoon, P. (2007). ICT professional development of teachers in Thailand: The lead-teacher model. In E. Meleisea (Ed.), *ICT in teacher education: Case studies from the Asia-Pacific region.* Retrieved from http://unesdoc.unesco.org/images/0015/001567/156757e.pdf

Whittier, D. (2011, March, 7). *The Teacher as Designer of Instructional Technology: Summarizing over 10 years of teacher education to use technology*. In M. Koehler & P. Mishra (Eds.), Proceedings of Society for Information Technology & Teacher Education International Conference 2011 (pp. 2792-2797). Chesapeake, VA: AACE.

Wiratchai, N. (2002). *Reforming process for learning quality development: Assurance and assessment.* Retrieved from http://www.onec.go.th/onec_backoffice/uploads/Book/33-file.pdf

Wolfe, J. (2000). *Learning from the past: Historical voices in early childhood education*. Mayerthorpe, Alberta, Canada: Piney Branch Press.

Wyatt, D. K. (1969). *The politics of reform in Thailand: education in the reign of King Chulalongkorn*. New Haven: Yale University Press.

Curriculum Vitae

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Key Qualifications

- Solid knowledge and research background in Thai educational reform, student-centered philosophy, online learning, Web 2.0, and multimedia and interactive education
- Skilled technical specialist with 7 years of experience providing educational technology support
- Interface well with people of diverse levels, backgrounds, and personalities
- Adapts technical programs for both experienced and beginning users
- Work well independently or as a collaborative team member

Education

2015	Ed.D. in Educational Media & Technology, Boston University, USA Dissertation Title: "An evaluation of teacher development in using technology during the first decade of Thai education reform 1999–2009"
2002	C.A.G.S. in Educational Media & Technology, Boston University, USA
1996	M.A. in Educational Media & Technology, Boston University, USA
1990	B.A. in Media and Education Technology, Srinakharinwirot University, Thailand

Work Experience

2006-2013 **Media Specialist**
Instructional Material Center, School of Education, Boston University

Performed end-user technical support. Installed, maintained, and supported instructional technology, computer systems, and networks

- Diagnosed and troubleshoot computer problems, printing issues, and network connectivity matters for students, faculty, and staff
- Collaborated and supported faculty, students, and staff in using hardware and software, giving presentations, and advice
- Organized, maintained, and authorized the use of instructional technology, computer programs, and networks
- Proposed and took part in a series of customer service and quality improvement projects to improve customers' experience
- Served as liaison between instructors and staff in scheduling, distributing, and using multimedia equipment in the classroom

2007-2008 **Lab Monitor**
The Alumni Medical Library Computer Lab, Boston University Medical Center

Interfaced with walk-in customers (students, faculty, staff) on a daily basis. Explained technical procedures in a clear, precise manner using personal knowledge and expertise, consulting with other support staff, or referring to senior-level technical staff.

- Maintained the general security of the lab equipment and enforced policies and procedures
- Maintained inventory of computer supplies necessary to meet customer needs
- Developed excellent client relations with internal and external departments

1996-2000 **Researcher in Educational IT Policy**
National Information Technology Committee Secretariat, National Electronics and Computer Technology Center, Ministry of Science Technology and Environment, Thailand

Assisted research projects in Thailand's IT policies initiative with data collection and administrative tasks.

- Coordinated, prepared, supported and developed the following publications: *Educational Multimedia Guideline*, *Tools and Developments in Multimedia Technology*, and *The Development and Multimedia Technology Apply for Commercial Agricultural Industrial and Other Social Service Sectors*, and *IT Vision for Thai teacher development*
- Assisted the project team in collecting and summarizing research and data to establish Multimedia Institute master plan
- Supervised organization's website with an emphasis on user experience. Arranged data on sites in a logical manner to ensure the user finds the information he is looking for
- Trained, guided, and offered school nationwide regarding IT related projects
- Served as a contact point among government agencies, academic institutions, and business sectors
- Instrumental in arranging domestic and international conferences

1990-1993 **Video Photographer (Royal Family Section)**
News Division, Thai TV Channel 3, Thailand

Directly contributed to the presentation of news for one of the four free TV channels in Thailand

- Directly contributed to the presentation of news and the development of ideas for news magazines

Publication

Pantawee, P., Jivaketu, P., & Charoendausil, B. (2001). *Internet user profile of Thailand 2000*. Bangkok, Thailand: National Information Technology Committee Secretariat.

Technical Skills

Software:

- Comprehensive MS Office Suite proficiency
- Adept at Photoshop, Acrobat, Weebly, Blackboard, and Dreamweaver
- Skillful use of Web2.0 for education and communication

Operating Systems:

- Windows OS, especially Windows 7 and 8
- Mac OS Lion, Safari, Pages, Keynote, Facetime, Photo Booth, iMovie, and iPhoto

Photography:

- Digital photo creation, editing, and posting

Hobbies Reading, photography, philately, traveling, cycling

References Available upon request