

Key Education Quality Determinants of Thai Secondary Schools in Bangkok

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Abstract

This study aims to investigate the key determinants of the quality of education of upper-secondary schools in Bangkok. 149 upper secondary schools and teachers were selected. The dependent variable was education quality, while the examined independent variables were the transformational leadership of the school principal, teacher quality, and school facilities. To evaluate the education quality of the students in the selected schools, the Ordinary National Educational Test (O-NET) and the General Aptitude Test (GAT) scores were employed. Both examinations are organized by The National Institute of Educational Testing Service to measure student academic proficiency: i.e. education quality. The results revealed that among the three independent variables tested, only teacher quality and school facilities had statistically significant impact on education quality, i.e. the O-NET and GAT scores. Teacher quality could explain 50.0 and 71.2 percent of the total variance for the O-NET and GAT scores, respectively. While school facility could predict 42.9 and 27.5 percent of total variance for the O-NET and GAT scores. All the three independent variables, could explain the O-NET and GAT scores up to 61.8 and 75.0 percent, while the rests were caused by other factors which were not included in this study. Moreover, the finding showed that school facility also had significant impact on teacher quality as well. In short, both teacher quality and school facility are considered as the key determinants of education quality for upper secondary schools in Bangkok.

Keywords: Education quality, transformational leadership, teacher quality, school facility.

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ลักษณะสำคัญของคุณภาพการศึกษาในโรงเรียนมัธยมศึกษาตอนปลายในเขตกรุงเทพมหานคร

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บทคัดย่อ

การศึกษานี้มีวัตถุประสงค์ในการค้นหาลักษณะสำคัญของคุณภาพการศึกษาของมัธยมศึกษาตอนปลายในเขตกรุงเทพมหานคร โดยศึกษาจากกลุ่มตัวอย่าง 149 โรงเรียน ลักษณะสำคัญของคุณภาพการศึกษาในการศึกษาครั้งนี้ ประกอบด้วย ความเป็นผู้นำในการเปลี่ยนแปลงของผู้บริหารโรงเรียน คุณภาพครูผู้สอน และสิ่งอำนวยความสะดวกในการเรียนการสอนต่างๆ ในโรงเรียน ในขณะที่คุณภาพการศึกษา คือ คะแนนการทดสอบการศึกษาระดับชาติขั้นพื้นฐาน และคะแนนความถนัดทั่วไปของโรงเรียนกลุ่มตัวอย่าง ผลการศึกษา พบว่า คุณภาพครูผู้สอนและสิ่งอำนวยความสะดวกในการเรียนการสอนมีผลต่อคุณภาพการศึกษาอย่างมีนัยสำคัญทางสถิติ และสิ่งอำนวยความสะดวกในการเรียนการสอนมีผลต่อคุณภาพครูผู้สอนอย่างมีนัยสำคัญทางสถิติ ในขณะที่ภาวะผู้นำทางด้านการเปลี่ยนแปลงของผู้บริหารในโรงเรียน ไม่มีผลต่อคุณภาพการศึกษาและคุณภาพครูผู้สอนอย่างมีนัยสำคัญทางสถิติ

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Introduction

Education is widely regarded as a key mechanism for improving the standard of the quality of life and the quality of an education can affect a nation's long-term economic growth (Hanushek & Woessmann, 2007; Hanushek, 2010). Porter (2008), a guru in management, has stated that every government in the nation must provide quality education in order to improve and enhance human well-being. People with knowledge are considered a valuable basic endowment, and create a competitive advantage for their countries. In the global era nowadays, competition among nations is very intense; therefore, skillful and knowledgeable labor is crucial in order to compete with one's neighbors and to generate wealth for the homeland. Furthermore, education is also used by the United Nations Development Program as its fundamental index to measure human development (UNDP, 2013).

The management of education in Thailand is carried out by the Office of the Prime Minister, the Ministry of Education (MOE), and the Ministry of Interior. Thailand has visualized the importance of education; as a result, its education plan was announced in the First National Economic Development Plan. Every Thai government has deep concern that Thai education is in a critical situation, and accordingly, the education budget has been allocated at the highest proportion of the Gross Domestic Product (GDP) for 10 years continuously, approximately 20 percent of the annual government statement of expenditure or 460 billion and 519 billion baht in 2013 and 2014, respectively, compared to 3.7 percent in 2000 (Office of National Education Standards and Quality Assessment: ONESQE, Bureau of the Budget 2013; 2014). By setting education objectives as follows: enhancing the capacity of all learners, being endowed with basic knowledge and essential skills and attitudes toward life-long learning, learning and developing learners to their highest potentially, the MOE has established several strategies to fulfill these objectives. The MOE has expected five keys competencies to be developed among learners, i.e., communication, thinking capability, problem solving capability, capability of applying life skills, and the capacity of technological application.

Problem Statements

Unfortunately, the quality of Thai education has not achieved the set objectives yet. Instead, it seems not to be able to provide quality education. According to the International Institute for Management Development (IMD), Thai education quality is ranked forty-seventh out of fifty-eight nations being considered. In Asia, Thai education quality lagged behind Vietnam in basic education, while Malaysia's education quality has improved constantly. Only Cambodia and The Philippines were behind Thailand in 2013. Even worse, the 2014 World Economic Forum (WEF) just reported that the Thai education quality system was rated a score of 3.4 out of 7, behind the Laos PRD position of 20. On the other hand, newspapers have stated that Thai students have won many medals at the International Mathematics and Science Olympiad every year. What are the factors that make these awarded students so distinguish from other Thai students in the overall nation? Many studies and much research (Norad, 2011; Education For All (EFA), 2005) have found that curricula, leadership style, teacher quality, school facilities, and student quality are significant factors in managing and enhancing school performance effectively. By the same token, a study was conducted to evaluate world-class standard schools in Thailand, and this obviously demonstrated that the similar three critical dominant factors—leadership, teacher, and the school facilities and environment—have significant relevance for education quality.

Research Objectives

The main objective of this study was to identify the key determinants of education quality in the secondary schools in Thailand. Several specific objectives were established as follows:

- a) To identify the key determinants of education quality of secondary schools in Bangkok.
- b) To explore the influence of transformational leadership style, teacher quality, and school facilities on education quality.
- c) To explore the influence of transformational leadership and school facilities on teacher quality.

Scope of Study

This research aimed to investigate the impact of leadership style, particularly transformational leadership, teacher quality, and school facilities in upper-secondary schools in the Bangkok Metropolitan area on education quality. Bangkok was chosen as a boundary for this study. Nonetheless, it is important to note that the Trium Udom Suksa Secondary School was excluded from this study since most of the students at this school have an extremely high level of academic performance as compared to the remaining population. In addition, this study emphasized the upper-secondary education level (grade 10 to 12) where education quality can be accessed systematically and accurately with the national examinations, O-NET and GAT; hence, the statistical tests and resulting correlations were reliable and valid. In total, the population was 219 schools under the supervision of the Office of the Basic Education Commission, Bangkok Metropolitan Administration, the Office of Higher Education Commission, and the Office of Private Education Commission. The independent variables, i.e., the factors potentially affecting education quality, targeted in this study were transformational leadership, teacher quality, and school facilities.

Related Information and Literature Review

Thai Education System

According to the National Education Act 1999 (revised 2002) and the Compulsory Education Act 2002, Thai education can be categorized into three types, i.e. formal, non-formal, and informal. Formal education is the system in which the objectives, curricula, procedures, study period as well as evaluation have been specifically established by authorized agencies such as the Ministry of Education. Non-formal education is more flexible than formal approach; nonetheless, its contents and curricula have to be appropriate, respond to the needs of individual groups of learners. This study will only focus on formal education; non-formal and informal education is outside its scope.

Formal education has been compulsory for all Thai children from pre-elementary to upper secondary education for a total of 15 years since 2009. It can

be divided into two levels, i.e. basic and higher education. Basic education consists of three sub-levels: pre-elementary, elementary, and secondary. The pre-elementary level aims to nurture and prepare preschoolers for elementary education. At the elementary level, students will have to take six years to complete the program. Elementary education focuses on basic literacy and numeracy skills and on cultivating desirable behavior on the part of students. The secondary education level can be divided into lower and upper secondary sub-levels; each takes three years to complete. Lower secondary education aims to continuously develop students' ethics, knowledge, and abilities. It allows students to explore their needs and potential careers. The upper secondary level aims to prepare students to move toward their profession goals and will be the focus of this research. This level provides two alternatives for students to choose, i.e., vocational-oriented and academic-oriented programs.

Quality and Quality Management

The term “quality” relates to excellence or the superiority of one thing which is of concern for a particular issue. Hence, the aspects of quality vary vastly depending on the specific arbitrator. No universal agreement on the definition of “quality” is accepted for all professions; different definitions highlight different aspects of “quality.” quality in manufacturing covers a wide variety of characters of the product that makes it emerge from the rest such as performance, features, reliability, durability, etc. On the other hand, the quality of a service focuses more on customers' satisfaction including suitability, completeness, politeness, consistency, availability, truthfulness, and receptiveness.

The American National Standard Institute and the American Society of Quality have defined quality as the totality of features and characteristics of product or service that bears on its ability to satisfy given needs. Especially, in today's highly competitive markets, merely satisfying customer needs may not make an organization achieve success. However, “quality” is not only used in the management field but also in other professions. Kelemen (2003) defined “quality” in a philosophical way as making useful things or acting in a contributing way to achieve desirable relationships within the group. Quality is intrinsic to the very notion of human existence and is

interconnected with all related resources involved. Therefore, quality management requires strategic management skills.

Education Quality

Quality in education is defined in various ways similar to quality in manufacturing and in service. Education quality is a multidisciplinary idea and cannot be easily accessed by only one indicator. Cheng and Tam (1997) defined “education quality” in a multi-dimensional fashion as “the character of the set of elements in the input, process, and output of the education system that provide service that completely satisfy both internal and external strategic constituencies by meeting their explicit and implicit expectations.” Although, education quality is defined in various ways but all meanings are in the same direction that usually related to fitness of use and satisfaction of the needs of strategic constituencies, including policy makers, parents, school management committees, teachers, and students.

It is widely known that education represents one of the most interesting and challenging areas for quality improvement. As reported by Kelemen, (2003), public schools in the United States have applied the principles of total quality (TQ) in their organizational management. In order to achieve the required quality, they have established four pillars : strong quality leadership (via planning and training), continuous improvement (via the performance appraisal review process, comprehensive local education plan, performance measurement system, and comprehensive local education plan), customer focus, and system/process focus, which serve as a foundation for the schools. Quality in education is closely concerned with the system of accountability and performance appraisal to control desired quality, such as certain standards, knowledge, and skills in accordance with society and labor market expectations. It is important to note that the education system is different from the production and service sectors in that it not only involves process input and output but also a multiple constituencies of an education institute. As a result, it is possible to find an excellent school with low quality in some aspects.

Measure of Education Achievement

The National Institute of Educational Testing Service (Public Organization) or NIETS under the Ministry of Education was established according to Royal Decree on September 3, 2005. NIETS's main objectives are to manage and administrate education, research, development, and to provide services for educational testing and measurement continuously. It also serves as a collaborative center for educational testing at both national and international levels. To fulfill its purposes, NIETS has to collect various educational statistical data from several related sources in the nation and plays a major role in selecting and assigning the performance indicators related to education quality for both local and international references. The outcomes are used as fundamental information for policy makers and other relevant units to be aware or to foresee existing as well as possible problems leading to correct decision making. It is very important to ensure that these designed and selected indicators were suitable benchmarks for evaluating the success or failure of the Thai education system. Many tests have been developed to evaluate students' performance according to their study areas such as the Ordinary National Education Test, I-NET (Islamic National Educational Test), N-NET (Non-Formal National Education Test), GAT (General Aptitude Test), PAT (Professional and Academic Aptitude Test), and so forth. The O-NET is organized nationwide semi-annually (March and October) for 6th, 9th, and 12th grade students. The assessment covers seven study areas including Thai, social studies, religion and culture, foreign language, mathematics, health and physical education, and arts and career and technology. In this study, O-NET and GAT are used as indicators for the study of education quality because of their nationwide coverage and standardization.

Leadership and Leadership Style

Some researchers believed that "leadership" is a personal quality, born with a person as a gift, and cannot be either made or developed or taught; however, many others think differently. The definition of leadership is still unclear, and there are more than 100 definitions (Rose, 1991); however, most of them describe the behaviors relevant to leadership as power, prestige, ability, authority, influence, management, supremacy, and so forth (Bennis, 1959). These attitudes cause persons to show their actions and behaviors that other people trust and are willing to follow (Northouse, 2012).

Leadership style is the behaviors or manners of the leaders expressed externally to the public, the community, and followers in order to influence and stimulate the followers to act or respond to the required directions in order to achieve the target goals. Today, leadership style is commonly believed to be a combination of gifted traits and skills developed from the learning process or obtained from personal experience. As a result, different leaders have dissimilar leadership styles; some will be successful in certain situations and environments whereas the others will flourish under different environments.

Leithwood and Jantzi (2000) reviewed the literature dealing with the leadership in educational administration and suggested five major categories of school leadership: instructional leadership, transformational leadership, moral leadership, participative and managerial leadership, and contingency leadership. Transformational leadership involves several issues, such as being charismatic, visionary, cultural, and empowering. The main focus of transformational leadership is the commitment and capacity of the members within the organization. This type of leadership will raise the target goals of the institute so that the productivity of the organization increases.

The concept of transformational leadership is well clarified by Bass and Avolio (1994), who used the term “Four I’s of Transformational Leadership” to described this character. These four elements are idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Dionne et al., 2004) The first two “I”—idealized influence and inspirational motivation—are related to the formation of the explicit vision of the organization, and the recognition and prioritization of future goals. Idealized influence and inspirational motivation are the necessary initial steps toward transformational leadership. Sharing visions, strengthening personality, inspiring followers to change their expectations and perceptions, and developing motivations and consensus about goals and priorities can stimulate followers to cooperate readily with the leader for the success of the organization. Moreover, the collaborative culture and atmosphere will be created within the organization, which is a very crucial factor for effective team performance (Weaver et al., 1997). Many studies have found a strong relationship among cohesion, transformational leadership, and organization

performance similar to the findings of Weaver et al. (1997). A later study by Bass et al. (2003) observed and found a positive relationship between transformational leadership and group performance. While, Dionne et al. (2004) attempted to characterize the relationship between intermediate outcomes and transformational leadership behaviors. They found that sharing a vision and committing to the leader had a positive impact on team cohesion and partially mediated the relationship among the idealized influence/inspirational motivation leadership and team performance. The third “I”, intellectual stimulation, aims to promote the intelligence, rationality, and effective problem solving ability of the followers. This can be done in several ways, including brainstorming in order to obtain different perspectives for problem solving from group members, tree analysis to gather new ways/approaches to completing assignments, sharing decision-making structures and processes, etc. Chen and Tjosvold (2002) indicated that well-handled conflict in an organization could lead to the development of quality solutions as well as strengthen the relationships within the organization. Effective management of conflict, particularly cognitive or task-oriented, which prevents infighting and inconclusive decisions, can lead to better effectiveness and performance. The last “I”, individualized consideration, is to consider and interact with followers as individuals using different manners/approaches, not just treating all members of the organization similarly. Behavior related to this factor includes teaching and training individuals in person to develop their strength as well as listening to and accepting others’ concerns. It is generally accepted that increased listening, prompt feedback, and openness to suggestions within the organization are essential for effective performance (Dyer & Reeves, 1995; Stevens & Campion, 1994; Zander, 1994). These individually-considerate behaviors may also serve to empower team members and open and extend lines of communication between the leader and each member of the organization, resulting in a positive impact of team communication (Dionne et al., 2004).

In education perspective, there are numerous studies have attempted to determine the relationship among the transformational leadership of the school principal (leader of the organization), teacher quality, and educational achievement. Yang and Lung (2010) pointed out the significantly positive relationship between

transformational leadership and physical education teachers' teaching performance and effectiveness in Taipei elementary schools. By the same token, transformational leadership principals, as perceived by their teaching staff, can raise the staff's willingness and contribution as well as their job satisfaction, which are the causes of teacher self-efficacy (Lussiez, 2009). In Thailand, most studies in regards to transformational leadership have revealed a high level of statistical significance between transformational leadership on the part of school principals and school achievement (Junment, 2009; Koolkrong, 2010) Likewise, Sakunsatapat (2009) conducted a study under the topic "A Model of Effective Transformational Leadership for Sustainable Education Reform" and concluded that there were both direct and indirect effects of transformational leadership on sustainable education reform at a very high significant level. Additionally, Onorato (2013) stated that transformational leadership in schools played crucial roles in leading the schools to reach high-standard levels as well as the enhancement of the school's performance as with typical business organizations.

As described previously, it can be concluded that transformational leadership is a necessary characteristic of the organization leader (in this research study it is the school principal) that can direct the institute to success. Thus, transformation leadership is considered as a priority factor affecting education quality and hence is of concern and has been applied as one of the independent variables in this study.

Teacher Quality

Teaching as a profession can be considered as an asset or human resource of a school. The competencies of teaching professionals absolutely add value to the academic institute. According to human resource theory and practice, competency refers to an individual's demonstrated knowledge, skills, or abilities (Ulrich et al., 1995). Teachers can reveal their competencies by delivering ideas, programs, and initiatives to their schools in addition to their routine teaching work. According to Barney (1995), all firms and many others need to find out their competitive advantages; otherwise, they will face an unfavorable situation and become low-performing firms. A competitive advantage is considered as a resource of the firm that is excellent compared to its competitors. From the school perspective, teachers can be counted as a competitive

advantage. Accordingly, schools principals have to take the issue of teacher quality into account as well. Qualified teachers can be created or trained. The more training they get, the more likely that positive outcomes will return to the schools. Highly-experienced and dedicated teachers are also counted as invaluable school assets.

Being school principals and teachers requires multiple skills other than just knowledge of teaching subjects. It is unfortunate that not all school principals and teachers possess the competent characteristics needed for education quality. Hence, the school principals' and teachers' development activities are required as in many other professional fields. The school personnel should not only focus on routine work and traditional practices but also consider the school's development and professional growth. Since school principals and teachers have different roles to play in the organization, their training or workshops should be different so that each need is fulfilled; for example financial, administrative, and transformational leadership aspects might be useful for school principals whereas up-to-date knowledge and teaching-aid technologies might be necessary for teachers. According to Lockheed and Verspoor (1991), who conducted a study in developed countries, an orderly school environment, academic emphasis, and the quality of leadership in schools were quality school determinants. However, in developing countries, these three factors are essential but not enough to guarantee effective schools. Acquisition, distribution, and use of material inputs are necessary supplementary factors to boost students' performance. Many studies state that the teacher's characteristics have a positive relationship with twelfth-grade students' academic achievement (Ket-Sing, 2007).

Several studies, including those of Anderson (1982), Hoy et al. (1990), and Tarter et al. (1995), have indicated that teachers' satisfaction, commitment, and behavior are drastically affected by social dynamics. Once the attitude and behavior of teachers are affected by these factors, the achievement of students will be consequently influenced. Numerous studies have been conducted to investigate this matter and they have reached several conclusions, with various suggestions. However, these studies have focused on different contexts; therefore, some indicators may be applicable only under certain situations or conditions. In this study, nonetheless, only the most

common factors that applicable to Thai secondary schools were investigated and elaborated. Proper indicators used to evaluate Thai teacher quality were selected according to the standardized questionnaire developed by the National Center for Education Statistics (NCES), which includes education background, certification and training status, and professional development. Education background refers to the highest academic degree earned by a teacher including quality of the institution, honors, certification, and subject matter credentials. Teacher style and teaching proficiency include the teacher's attitude toward his or her teaching career and the ability to manage the class, draw student attention, teaching strategies and assessment, and behavioral interaction with students in class as well as the methods used for instruction, etc. Professional development is visibly noticing that teachers attempt to acquire and improve their skills and knowledge in teaching, and enhance their ability to gain new knowledge and technology in teaching using numerous approaches that facilitate learning opportunities.

School facilities

According to Drake and Roe (1994), school facilities act like a linkage between schools and communities in regard to the school's as well as the principals' value. Moreover, facilities also imply some academic aspects such as school performance and effectiveness. It is widely accepted in many studies that school facilities have an impact on both the students' and teachers' performance. The school facility has been often shown to be another factor that significantly impacts the quality of education by several researchers and practitioners, particularly in developing countries; however, its relatively weighted effects vary significantly from country to country (Murillo & Roman, 2011). In the overall picture, school facilities have considerable impacts on the students' and teachers' performance. Buckley et al. (2004) demonstrated that improving school facilities is likely to improve in academic achievement. In a later study, Uline and Tschannen-Moran (2008) conducted a survey of 80 middle schools. The results confirmed the link between the quality of school facilities and student achievement in foreign language and mathematics. They also found that school climate had an impact on facility quality and student achievement.

School facilities can be categorized into 2 main groups, i.e., a) basic facilities and environment and services such as buildings, water supply, electricity, sewage treatment and discharge, etc.; and b) didactic facilities covering sport installations, labs, libraries, information and communications technology (ICT), etc. In this research, however, basic infrastructure and service will not be examined in detail since most secondary schools in Bangkok have some limitations in terms of land, buildings, and noise control. Hence, to expand building or land may not be possible in the current situation and the noise issue is also out of the school principal's control depending on the traffic conditions and environment nearby the schools.

Basic Facilities, Environment, and Service

Facilities that support student learning vary vastly—from fundamental needs such as lighting (Schneider, 2003; Uline & Tschannan-Moran, 2008), temperature control (Cash, 1993; Chan, 1996; Hines, 1996; Lanham, 1999; Earthman, 2004), indoor air quality (Wargocki & Wyon, 2006; Buckley et al., 2004; Earthman, 2004), noise and acoustical control (Haines et al., 2001; Klatte et al., 2010), building condition (McGuffey, 1982), etc. Building conditions and building age also have an impact on student performance. Fritz (2007) studied the effect of new school facilities on student achievement and found that there was a statistically-significant difference in students' performance before moving and after moving into a new building. Studying in a new building, students' achievement in reading and science increased. Similarly, Smith (2008) examined school building quality and student performance in South Carolina public schools and pointed out that there were five major areas affecting student performance: a) science labs, b) the decoration of painting and furniture, c) the degree of security measurements, d) the adequacy of the heating, ventilation and air condition in class, and e) the availability, functionally and size of athletic facilities. Deteriorated buildings together with a poor learning environment not only have an adverse impact on students' learning but also have a significant effect on the teacher's attitudes, behavior, and performance (Lowe, 1990; Dawson & Parker, 1998; Schneider, 2003; Buckley et al., 2004).

Didactic Resources

The school library provides access to information, both electronic and traditional resources, and facilitates their use. Library is the main source for students to search for up-to-date knowledge and to learn, resulting in an increase in education quality. A study in Pennsylvania, USA, indicated that students performed better academically in the schools advocating good libraries with sufficient information literacy support (Lance et al., 2000). One key factor affecting student performance according to Tanner (2000) was the availability of information and communication technology for teachers and students. Computers are a powerful educational tool and are widely adapted in many schools at present, according to the American Association for the Advancement of Science (AAAS). With the advancement in ICT, numerous new techniques have been adopted by many schools and universities. Teaching with usage of ICT obviously improves learning efficiency as well as changes in the concept of teaching (Robin, 2009). ICT has rapidly become involved in education and training at all levels in the EU and OECD. (Organization for Economic Co-operation and Development) As stated earlier, it is essential to take the purpose of facilities into account when considering education quality.

Conceptual Framework

According to the literature review, the relationship among the dependent variable, i.e., education quality, and independent variables, i.e. transformational leadership, teacher quality, and school facilities, were constructed and conceptualized in a model as shown in Figure 1. Consequently, the following eight hypotheses were derived and were statistically tested for their validation (rejection or acceptance) so that the behavior, relationships, or characteristics of the

population (upper-secondary schools in Bangkok) could be correctly explained, which will aid local administrators and policy makers in making appropriate decisions regarding education quality improvement.

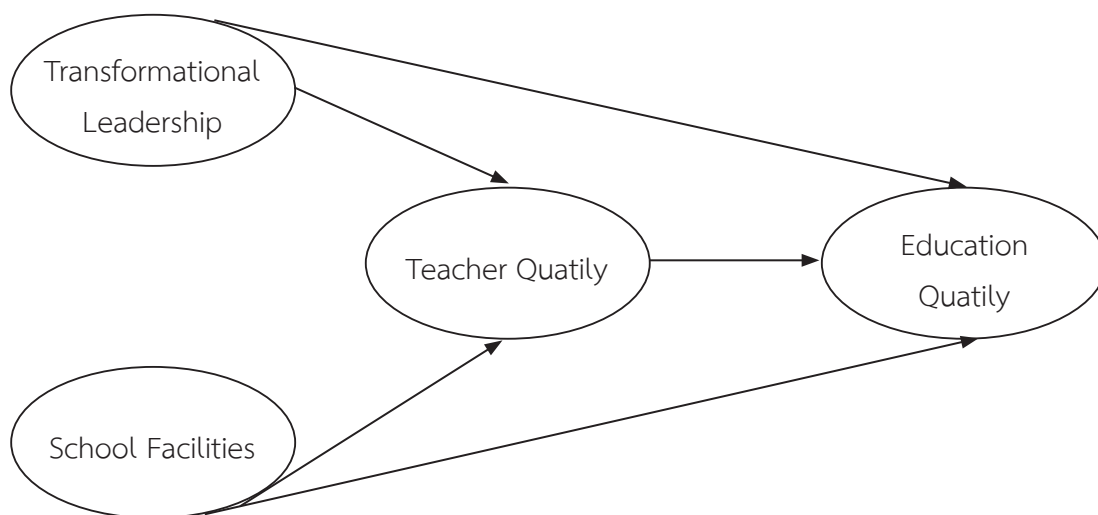


Figure 1: Conceptual Framework for Keys Determinants of Education Quality

Hypothesis 1: The transformational leadership of the school principal has a significant impact on the O-NET score of students.

Hypothesis 2: Teacher quality has a significant impact on the O-NET score of students.

Hypothesis 3: School facilities have a significant impact on the O-NET score of students.

Hypothesis 4: The transformational leadership of the school principal has a significant impact on the GAT score of students.

Hypothesis 5: Teacher quality has as significant impact on the GAT score of students.

Hypothesis 6: School facilities have a significant impact on the GAT score of students.

Hypothesis 7: The transformational leadership of the school principal has a significant impact on teacher quality.

Hypothesis 8: School facilities have a significant impact on teacher quality.

Research Methodology

The objective of this study was to examine the impact and the relationship of the three determinants (independent variables)—i.e. transformation leadership, teacher quality, and school facility—on education quality represented by the averaged O-NET and GAT scores of the schools (dependent variable) in secondary schools in Bangkok. Factor analysis, stepwise multiple regression, and the path analysis test were the main statistic tools for performing the inferential statistical measure. There are several hundred schools, both public and private, in Bangkok. However, only 219 schools have grade ten to twelve education. In this study, the samples were drawn from Thai secondary schools located in the Bangkok area. The teachers that have taught at the upper secondary education level in the selected schools were considered as the targeted samples. According to Krejcie and Morgan's table for determining the sample size, it was found that the appropriate sample size for the was 136, which was enough to provide a 95 percent confidence level for statistical significance. However, 149 samples from 200 questionnaires were collected; hence, the researcher used all 149 as the sample of this study. Convenience sampling is the most appropriate method in this study due to the difficulty in accessing the schools.

In addition, pretesting the questionnaire with experienced specialists about the construction of proper questions has been a crucial step. Potential difficulties or vague points which might not be identified in a pretest with regular respondents may be revealed. To test the reliability and validity in this research, the Cronbach's alpha statistics and factor analysis approach were adopted in order to provide internal consistency of the scales as well as construct validity.

Results and Discussion

Background and demographic information

The basic demographic information on the respondents provides the general background of the respondents, of the total samples of this study (N=149): the majority of the respondents were female teachers (59.7 percent). 50 percent of the samples were under the age of 40, whereas another 50 percent were above 40 years

old, implying that the selected samples were equal and well distributed regarding age. The data and information obtained from the questionnaires covered the opinions, perspectives, and sentiments of new generation and elder generation, which might be different from each other regarding the testing parameters. More than half of the respondents held a bachelor degree (53.7 percent) followed by a master degree (44.3 percent) and doctoral degree (2.0 percent). Of the total samples, a few respondents graduated from Rajamangala Universities; however, the majority of respondents graduated from other public universities (73.6 percent). The major subject of most of the respondents was educational administration and related educational fields, followed the sciences and English. According to the work experience of the sampling teacher group, it was found that the average, maximum, and minimum work experience were 18.83, 44, and 1 year(s), respectively. Regarding the training and professional development for the academic, the results indicate that most of the responding teachers also attended outside-school training programs 4 times in one academic year on average. They also participated in seminar workshops and in-house training 2.5 times in an academic year each, while they had a field trip twice a year on average.

The 2014 O-NET and GAT scores were used as indicators of education quality in Thailand. It is important to note that the O-NET and GAT scores of the students that did not complete all of their examinations (5 subjects for O-NET and 2 parts for the GAT) were excluded from the analysis. The averaged O-NET scores of secondary schools in Bangkok (from 149 schools) was 34.89 (which was averaged from 5 core subjects, i.e., Thai, foreign language, mathematics, sciences, and social studies, religion, and culture), while minimum and maximum scores at 22.87 and 59.78, respectively. Similarly, the average GAT score was 51.073 while the minimum and maximum scores were 17.95 and 82.63, respectively. It is worth remarking that both the O-NET and GAT scores presented in this research were transformed to a 0-100 scale.

The results for key determinants of education quality

Path analysis was employed to analyze the influence among the variables, which were derived from intensive reviewing of many studies. Moreover, all of the variables were found to affect each other to some extent. Two types of variables,

exogenous and endogenous variables, were presented in the model. The correlation matrix and collinearity statistics (tolerance and VIF values) indicated no sign of multicollinearity violation as shown in Table 1.

Table 1: The correlation matrix and descriptive statistic of independent variables

	TL	TQ	SF
TL	1.00		
TQ	.073	1.00	
SF	.327	.430	
Mean	26.7623	7.5275	7.5889
S.D.	5.0232	1.5840	1.3864
Max	36.17	9.810	10.00
Min	14.08	3.160	4.945
Tolerance	.888	.810	.728
VIF	1.126	1.234	1.374

Direct and indirect effects

As shown in Table 2, the results of the path analysis displayed one indirect effect on teacher quality and two direct effects on the O-NET and GAT scores. As hypothesized, teacher quality was directly significant effect in predicting the O-NET scores at 50 percent of total variance. Likewise, school facilities had total effect on the O-NET score at 64.4 percent that came from direct effect at 42.9 and indirect effect at 21.5 percent of total variance. In addition, school facility had direct effect on teacher quality at 43 percent. Again, transformational leadership surprisingly showed no statistically-significant effect on either the O-NET score, GAT score, or teacher quality. Interestingly, the path model showed that teacher quality had a highly direct effect on the GAT score at 71.2 percent of total variance. Meanwhile, school facilities had total effect on GAT score at 58.1 percent that could divide into the direct and indirect effect at 27.5 and 30.6 percent of total variance. From a combination prospect,

O-NET	Standardized Coefficients	t-value	Sig	Causal Effect		
				Direct	Indirect	Total
TL	-.103	1.531	.128	-	-	-
TQ	.500	8.814	.000*	.500	-	.500
SF	.429	5.775	.000*	.429	.215	.644
R = .786 R ² = .618 SEE = 22.083 F = 117.860 Sig of F = .000 *p < .05						
GAT						
TL	.055	1.181	.235	-	-	-
TQ	.712	15.526	.000*	.712	-	.712
SF	.275	5.991	.000*	.275	.306	.581
O-NET	Standardized Coefficients	t-value	Sig	Causal Effect		
R = .868 R ² = .750 SEE = 13.498 F = 218.966 Sig of F = .000 *p < .05						
TQ						
TL	-.075	-.952	.343	-	-	-
SF	.430	7.560	.000*	.430	-	.430
R = .430 R ² = .205 SEE = 1.434 F = 33.348 Sig of F = .000 *p < .05						

From Table 2, path equations for key determinants of education quality were constructed and shown as follows;

$$\text{O-NET} = -.103 \text{ TL} + .500 \text{ TQ} + .429 \text{ SF} \dots\dots\dots (1)$$

(1.513) (8.814) (5.775)

$$\text{GAT} = .055 \text{ TL} + .712 \text{ TQ} + .275 \text{ SF} \dots\dots\dots (2)$$

(1.181) (15.526) (5.991)

$$\text{TQ} = -.075 \text{ TL} + .430 \text{ SF} \dots\dots\dots (3)$$

(-.952) (7.560)

where: O-NET = O-NET score
 GAT = GAT score
 TL = Total transformational leadership
 TQ = Total teacher quality
 SF = School facilities

Table 3: Summary of Test Results for the Hypotheses

Hypothesis No.	Hypotheses	Outcome
1	Transformational leadership of school principal has significant impact on O-NET score of students	Rejected
2	Teacher quality has significant impact on O-NET score of students	Accepted
3	School facilities have significant impact on O-NET score of students	Accepted
4	Transformational leadership of school principal has significant impact on GAT score of students	Rejected
5	Teacher quality has significant impact on GAT score of students.	Accepted
6	School facilities have significant impact on GAT score of students	Accepted
7	Transformational leadership of school principal has significant impact teacher quality	Rejected
8	School facilities have significant impact on teacher quality	Accepted

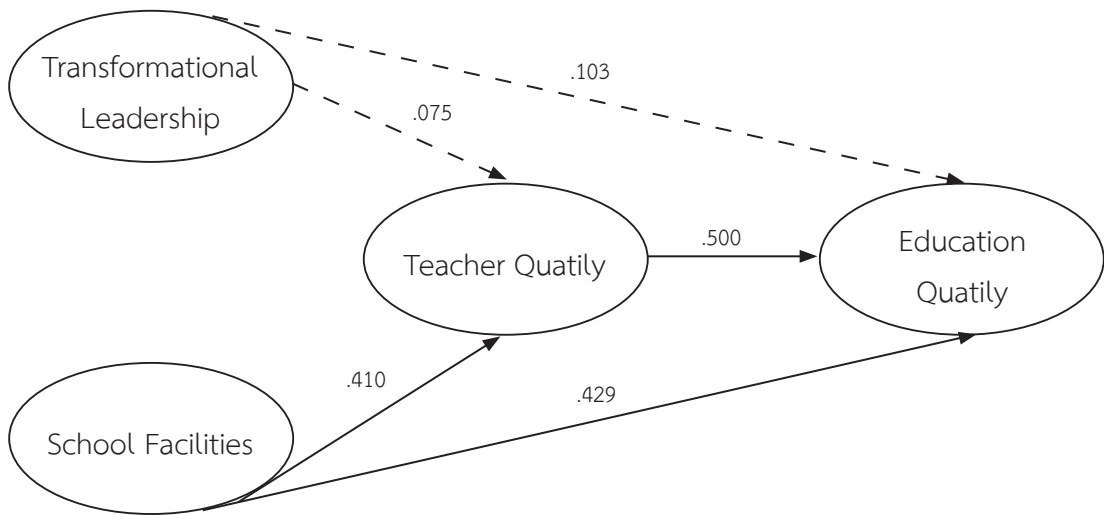


Figure 2: The path model for O-NET score (N=149)

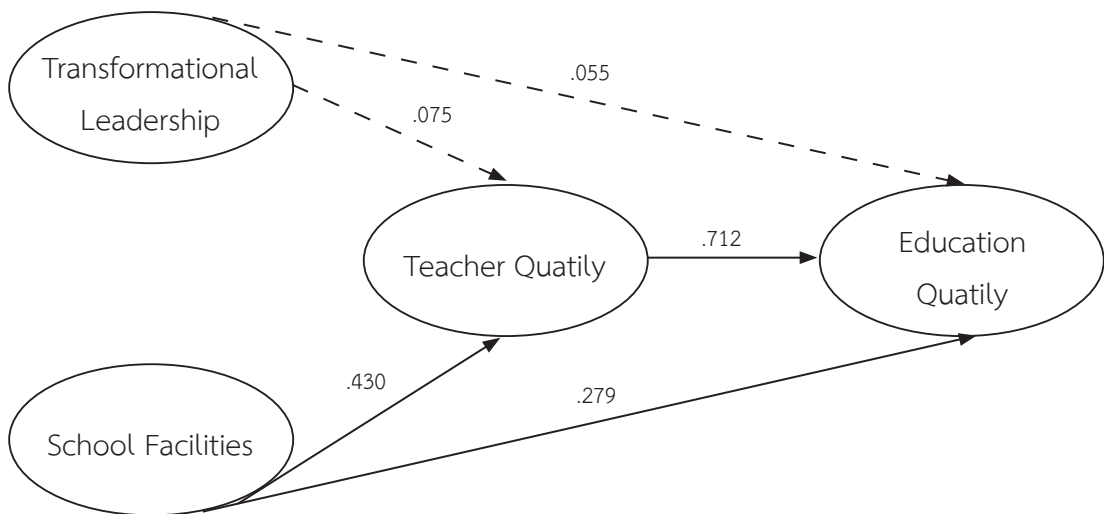


Figure 3: The path model for GAT score (N=149)

In short, the transformational leadership of the school principal had no significant relationship with the teacher and education qualities. On the contrary, teacher quality and school facilities had a remarkable influence on education quality. Moreover, school facilities also affected directly teacher quality, which consequently influenced education quality as a whole. Based on both the direct and indirect effects, teacher quality showed the most influence on education quality in terms of the students' GAT score, whereas, school facilities played a major role in the education quality in terms of the students' O-NET score. Hence, both teacher quality and school facilities are the key determinants for education quality of secondary schools in Bangkok in this study.

Recommendations

The findings from this study will fulfill the important need to clarify the factors affecting Thai education quality so that the concerned parties or organizations can effectively decide, plan, and launch the necessary measures to improve the quality of the nation's education system and consequently produce human resources that are able to compete with foreign rivals in the global market. The results from this study indicate that school principals should realize the importance of the professional development of teachers. Therefore, principals can promote their teachers' quality by providing appropriate programs. By the same token, teachers can develop themselves to be value assets, and should engage in professional training.

Nowadays, schools, both public and private, are very competitive, especially private schools. Principals have to adapt themselves to cope with rapid change. Today, textbooks and blackboards are not enough—principals need to seek appropriate and modern equipment and technology to assist both teachers and learners. It is also important for private school principals to find out how to create sustainable competitive advantages that can attract students to study in their schools. Moreover, school principals should properly design their human resource management, which covers planning, recruitment, selection, maintaining, and development processes. HR planning is the upstream of education quality; therefore, principals need

strategic planning skills to attract the right people, for the right subjects, with the right skills and at the right time. The most compelling evidence why some schools, both public and private, are confronting the problem of surplus demand is the number of applicants exceeds the quota every year, whereas some schools has never experienced this problem. At present, the Minister of Education and related agencies should begin and continuously provide necessary training or workshops for school principals so that their vision and attitude toward school management can be improved. Nonetheless, it would not be wise if Thailand totally followed the education system. and management of other countries without any modification or adaptation since the attitude, tradition, and culture of Thai people are different from those of other people.

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