A DEVELOPMENT OF A TEACHER LEADERSHIP FRAMEWORK
FOR GIFTED EDUCATION IN THAILAND

Jane Keunjapchoomin

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of
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in Educational Leadership
Graduate School of Education
ASSUMPTION UNIVERSITY OF THAILAND
2014
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Teacher leadership was examined in the context of gifted education in Thailand for a development of an effective framework. An explanatory mixed method design was employed involving both quantitative and qualitative data collection from content analysis; and survey, interview and document from teachers. Results revealed that there were three major areas and nine attributes leading to effective teacher leadership. School leaders, teacher leaders and principles of learning are major considerations for teacher leadership to succeed in gifted education. Findings revealed that the gifted high school under study demonstrated good overall teacher leadership. Two significant areas strongly permeating were teacher collaboration, and teachers’ relationship and positive influence on one another. Two areas that were perceived less strongly present at the school were distributed leadership and professional learning community. The findings suggest that the framework can serve as a guideline for both gifted and general education in Thailand. Since the school is the country’s number one high school for the gifted; the prevailing teacher leadership practices currently found can to some extent be a legitimate framework to emulate.
ACKNOWLEDGMENTS

My decision to undertake this journey was fueled by my passion to see changes in the educational landscape in Thailand. Teachers and the role they play are the most crucial factors that can contribute to student learning, and as teachers, we can make that change in our own classrooms.

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CHAPTER I

INTRODUCTION

Background of the Study

In many countries, the concept of teacher leadership has received much attention from the education circle as it holds promising potential in leading school change. Economic growth, social expectations and political forces together combined has created a climate in which educational reform is expected especially in the age of high accountability. Central to this, is the increased pressures and demands on teachers. Wallace (2002) stated that evidence from research on school’s effectiveness and school’s improvement has delineated that effective leaders exert a powerful influence on the effectiveness of the school and the achievement of students. Leithwood and Jantzi (2000) posited that findings have shown that even though effective school leaders do bring about a significant influence on student learning outcome, it is the actions of teachers that have acted as the intermediary agents. Briefly stated, the contribution of principal leadership to school effectiveness and improvement is overshadowed by that of teacher leadership (Wallace, 2002). Barth, 2013, reiterated in an interview with Educational Leadership that a school’s community should be made-up of many leaders: principal, teachers, students, and parents, and “our business ought to be to promote profound levels of learning in school – and teacher leadership is one of our most powerful assets for doing so.” In an earlier study, Barth also stressed on how schools badly need the leadership of teachers if they are to improve. He asserted that teachers become active learners in an environment where they are leaders. When teachers lead, principals’ own capacities get
stretched; resulting in higher student learning amidst a democratic community of learners, and the overall impact is that schools benefit from better decisions (Barth, 2001a).

However, it is not the intent of this study to suggest that by solely promoting teacher leadership will lead to major changes in student learning. But, if schools are to push for improvements, teacher leadership can be seen as one means of achieving pedagogical proficiency to impact student learning.

So, what is teacher leadership? In essence, teacher leadership is the process by which teachers, individually or collectively, influence their colleagues, principals, and other members of the school community to improve teaching and learning practices with the aim of increased student learning and achievement (York-Barr & Duke, 2004). There has been growing weight of empirical evidence lately that highlights the high potential and potency of teacher leadership. This includes the leadership of support staff, both within and between schools (Harris and Muijs, 2005). Bottom-line is: the structural and hierarchical order of leadership that equates principal to leadership is undergoing a redefinition as the architecture of schooling becomes more diverse, complex and innovative in meeting the challenging demands of learners in the 21st century. What are now more appreciated are leaders that empower their teachers and staff, leaders who support and embrace distribution among their members, leaders that encourage sharing in their schools, namely, with their teachers.

In saying that, the researcher would like to focus on teacher leadership falling in the hands of all teachers, sometimes referred as informal teacher leadership. Barth (2001b) stated that „all teachers can lead! most teachers want to lead…and that teachers who become leaders experience personal and professional satisfaction, a reduction in isolation, a sense of instrumentality, and new learnings – all of which spill over to their teaching. As school-based
reformers, these teachers become owners, and investors of the school rather than mere tenants. They become professional.”

The notion that teacher leadership roles lies with individuals that hold functional positions; such as subject heads, heads of departments must be overhauled if schools seek for developmental progress. By extending roles of teacher leadership to all teachers will certainly create multiplication effects that lead to overall improved school communication and involvement. The roles teachers play must therefore not be confined to being mere “representatives” of change, rather as “leaders” who dare to enact and initiate change, especially in gifted education where there are higher stakes. The metaphor asserted by Katzenmeyer and Moller in 1996 in their best-selling book “Awakening the Sleeping Giant: Leadership Development for Teachers” sends a strong message – that the dormant status of teachers should not be undermined, as when empowered (if aroused) can wield mighty power.

Statement of the Problem

The words “leader” or “leadership” should not be synonymous to only certain “elite” individuals. Leadership should be viewed as a quality that every individual has a right to claim, and can be developed. Most of us think of a leader as someone who takes additional roles outside the classroom (Collay, 2013), therefore classroom teachers have always been perceived as only “regular” teachers, teachers that do not take on any leadership role. This perception has been further reinforced and ingrained by the historical patterns of school management. We witness teachers working in isolation, and worse still, excluded from any decision-making processes that involves the school and student learning. Teachers are also constantly and accidently de-skilled through a barrage of misguided mandates (Cochran-Smith & Lytle, 2006).
Crowther (2009) posited strongly that, if teacher leadership is to emerge, a supportive organizational environment must permeate. However, Odell (1997) pointed out that for teachers to be effective teacher leaders, they must first be an accomplished teacher, in order to gain the respect and trust from others.

So, what are the key implications of teacher leadership in a school for the gifted? Davis and Rimm (2004) stated that gifted students are a unique group of learners who have a higher intellectual ability or creativity than their same-age peers. Therefore, to meet and serve the cognitive and emotional needs of these high ability students, the school’s curriculum design has to challenge and stimulate their high intellectual minds, and this is further achievable with good teaching and learning instructions.

However, making provisions for gifted students can be sometimes worrisome and challenging for teachers who are not trained. The National Association for Gifted Children (NAGC) in 1998 purported the use of a differentiated or modified curriculum to meet these learners’ unique needs. Hong et al. (2006) cautioned that although teachers may be sensitive to the needs of the gifted students, they may however still be unprepared to promote effective differentiated instruction, and this could be due to the lack of understanding on the part of teachers, of the cognitive needs of these high ability students especially those gifted in science and mathematics. Furthermore, a lack of a repertoire and knowledge of successful teaching and learning strategies can also have a negative impact on students that need their higher order thinking skills activated.

In Thailand, the provision of specific education programs for the gifted and talented students was only introduced in 1984, when the Institute for the Promotion of Science and
Technology (IPST) initiated a national project in response to the declining interests among youth in the study of science and math. The project entitled “The Development and Promotion of Gifted Students in Science and Technology (Por-Sor Wor-Tor)” was launched to attract and mold students of exceptional talent in these fields for the country, and since then serious efforts have been made by the Ministry of Education in support of gifted education especially, in science.

In 1990, a school system was set-up in support of this initiative. Mahidol Wittayanusorn School (MWITS) is the first and only national science high school for the gifted in Thailand. Only 240 students are enrolled each year, and annually, there are approximately 20,000 applicants nationwide. Student admission is based on the school’s admission examinations on mathematics and science, and a scholastic aptitude test. The school opens its door to students from the age of 16-18, or from Grade 10-12, thus, the school has a yearly student population of 720 for the combined three grade levels.

In 2000, a decade later, the school’s status was changed to a “public organization” and a school executive board governed by some of the country’s leading scientists and scholars was established with the board having full autonomy in the school’s administration and curriculum design. In 2009, with MWITS’ success in its curriculum and students’ learning outcome, the Ministry of Education designated the national science school as the model school for 12 Princess Chulabhorn Colleges (PCC) throughout the region. This led to these 13 schools sharing the same criteria in student selection, curriculum content and examinations in some of their gifted science classrooms. However, to date, the 12 Princess Chulabhorn Colleges have not enjoyed much fame in terms of students’ achievement or recognition from participation in national and international competitions. This could be largely due to its young implementation
stage of the gifted programs or factors such as lack of teacher training on the subject of gifted education or teacher qualifications.

For this reason, the researcher, an English teacher herself with almost five years’ experience teaching the advanced English students from Grade 10-12, would therefore like to conduct a study on “teacher leadership in gifted education”, one that extends beyond gifted science education, focusing specifically on the country’s first and only full-fledged high school for the gifted. The researcher is keen to focus on the informal teacher leadership role (bottom-up approach) that sees the involvement of all teachers from all subjects, than of only a handful that have been accorded with hierarchical formal positions (top-down approach).

Rizza and Gentry (2001), in their report obtained from six leading scholars on gifted education; Gallagher, Kaplan, Reisss, Renzulli, Tomlinson and VanTassel-Baska, entitled “A Legacy of Promise: Reflections, Suggestions, and Directions from Contemporary Leaders in the field of Gifted Education” synthesized that the experts generally shared the same consensus: that the research carried out on gifted education thus far has been the key enabler that has directly contributed to general education reform. Pfeiffer (2003) echoed the same sentiment when she stated that it is through educational innovations found in gifted education research that have largely connected gifted education with general education. Theory and pedagogical practices that are staples of gifted education and foster complex learning increasingly are influencing general education in the areas of curriculum differentiation and curriculum development strategies (Tomlinson et al., 1999).

It is therefore, the researcher’s philosophical belief that to be an accomplished teacher, regardless whether in a gifted or non-gifted educational environment, there is compelling need
for all teachers to assume ownership of their profession. Teachers must take upon themselves to act as leaders, and to understand the underlying characteristics and theories of giftedness in order to strive for pedagogical and instructional excellence in classrooms. As Harris and Muijs (2005) had pointed out, teacher professionalism and expanded leadership roles will serve students best as teachers are the closest to classrooms, hence, teachers hold the key to implement changes that make a difference to learning and learners.

The researcher hopes that this study on teacher leadership in gifted education will provide some form of knowledge to existing teachers or potential teachers. It is also the wish of the researcher to see the effective teacher leadership come in handy in creating awareness to all general education teachers in regular schools. The importance of being in-charge in our classrooms cannot be relegated further; the march is on for teachers to take accountability of their students’ learning in the hope of raising the education standards in Thailand.

**Research Questions**

The study will examine teacher leadership in a national high school for the gifted. Special focus will be placed on the dynamics of how teachers interact as leaders within the school, in an effort to achieve pedagogical and instructional excellence, and these are not limited to an individual teacher’s classroom but on a wider school-level. The research will be guided by the following questions:

1. What is the effective teacher leadership for gifted education?
2. What are the current teacher leadership practices that exist in gifted education in Thailand?
3. What is the desirable teacher leadership for gifted education in Thailand?

**Research Objectives**

1. To identify the effective teacher leadership for gifted education.
2. To identify the current teacher leadership practices that exist for gifted education in Thailand.
3. To develop an effective teacher leadership framework for gifted education in Thailand.

**Theoretical Framework**

The theoretical framework for this study is centered on two major theories from the discipline of leadership, and two key learning principles related to gifted education. The leadership theories will describe the types of leadership that will facilitate effective teacher leadership, while the latter two principles of learning will highlight the body of knowledge on how gifted learners learn and think, so as teachers can implement appropriate instructional strategies that meet the needs of this high-ability community.

**Distributed leadership**

Most leadership theories that reflect an industrial paradigm are no longer applicable in the 21st century, and have undergone a paradigm shift to theories and practice that can relate to the post-industrial needs. One such leadership theory that supports teacher leadership which has grown in popularity and has received much empirical support in the last few years is distributed
Distributed leadership is a sharp contrast to the traditional notion of leadership of the industrial age, a leadership that is still commonly seen in action today, whereby an individual or a few individuals manage the school hierarchically. Distributed leadership is collective in nature and is a leadership practice which „every person at entry level…in one way or another, acts as a leader” (Goleman, 2002:14). Distributed leadership stresses on the process of thinking about leadership, as opposed to another technique or practice. Harris and Lambert (2003) reiterated that in perceiving distributed leadership as a process, the nature and scope of leadership expand, and is re-conceptualized to fall in the hands of a larger majority against a few. Therefore, distributed leadership focuses on creating a synergy of expertise within the individuals of an organization rather than a single energy from the principal, heads of department or other formal roles.

**Transformational leadership theory**

Transformational leadership theory is one of the “new leadership” paradigms that have occupied a central place in leadership research. It was conceptualized by a political sociologist James MacGregor Burns in 1978. Burns’ initial conceptualization attempted to link the roles of leadership and followership. For Burns, there is a clear distinction between leadership and power because it is inseparable from followers’ needs (Northouse, 2010). Burns distinguished transformational leadership as a process where the engagement process of an individual with others creates a connection that raises the motivation level and morality in both the leader and follower. A reciprocal exchange sees the leader being attentive to the needs and motives of followers and tries to help followers reach their fullest potential.
In the mid-1980s, Bass (1985) expanded and refined Burn’s transformational leadership by emphasizing on followers” needs than that of leaders”. He contended that transformational leadership impacts followers in three aspects: a) raises followers level of consciousness about the importance and value of specified and idealized goals, b) gets followers to transcend their own self-interest for the sake of the team or organization, and c) moving followers to address higher-level needs.

Transformational classroom leadership is therefore a key consideration in teacher leadership whereby teachers can initiate unlimited transformative potential in their colleagues as well as their students, in the way that affects their peers” and their student”s beliefs, motivation and teaching and learning outcomes.

**Bloom Taxonomy of the Cognitive Domain**

In recent years Bloom’s cognitive taxonomy has received much recognition as a valuable guide for the teaching and learning of gifted students (Brain, Bourgeois, & Pappas, 2003). Bloom”s 1956 Taxonomy advocates for differentiation in instruction for gifted students with a hierarchy model of cognitive domains that emphasize higher level thinking skills (see Figure 1). Hoy and Hoy (2009) advocated that the methods used by teachers for gifted students should encourage abstract thinking, creativity and independence, and not just the learning of greater quantities of facts. In doing that successfully, a teacher must be imaginative, flexible, and unthreatened by their students” capabilities.”
Understanding the 1990s’ revised version of Bloom’s Taxonomy of Cognitive Domains as cited in Pohl, 2000, would provide a clearer framework for teacher leaders of the gifted to plan on what teaching pedagogies would provide optimal help in the ignition of higher-order thinking (analysis, evaluating, creating) of gifted students.

**Problem-based Learning**

Problem-based learning (PBL) is an instructional, student-centered strategy in which groups of students are confronted with real problems to solve. Constructivist in nature, the main goals of PBL is for students to identify information gaps and to seek and organize new information on account of the described problem. PBL’s strengths among others are the fostering of autonomous learning and personal responsibility. Because it is based on the premise of constructivism, students benefit from working cooperatively and communicating constructively, and their social behavioral skills get sharpened as they negotiate to find
meaningful solutions to the problem with their peers. PBL fosters learning in context, and an important gain from learning based on problems and cases, is that, students retain the curriculum concepts learned in their long-term memory, consequently, building their competency in other applications and transfer of knowledge.

Conceptual Framework

The conceptual framework is depicted in Figure 2. The focus of this study is driven by the researcher’s observation as a teacher in a gifted school that teachers themselves often overlook their own leadership capacities and their potential to positively influence students’ learning outcomes. Even though, it is undeniable that formal leadership roles are necessary for any educational institution to succeed, however, these leadership roles have often been restricted, with only a handful of teachers assuming formal titles. School leaders would be better-off if they provide a transformative and supportive climate for teacher leaders to emerge in order to transform schools to produce positive results.

More importantly, for teachers involved in the teaching and learning of gifted learners, a large gap still exist in the implementation of complex educational practices if teachers have limited access to the conceptual foundations necessary to address the intellectual and emotional needs of these students. Two learning theories will be discussed as integral parts in addressing this gap as they identify key practices that guide teacher leaders to teach thinking processes as well as social emotional learning.
While the study on the process of being a teacher leader will be framed by the conceptual constructs below, it is however not limited by its scope, rather they will attempt to provide key informative guidelines to the process on how teacher leaders can emerge and how pedagogical excellence can be achieved through the understanding of explicit thinking processes the gifted students possess.

**Figure 2. Conceptual Framework**


  *Two leadership theories*
  - Distributed Leadership (Spillane et al., 2001)
  - Transformational Leadership (Bass, 1985)

- **Gifted Education**

  *Two principles of learning*
  - Bloom Taxonomy of the Cognitive Domain (Bloom, 1956)
  - Problem-based learning (Mc Master Medical School, 1969)

  **Identify Effective Teacher Leadership for Gifted Education**

  **Identify current Teacher Leadership practices at Mahidol Wittayanusorn School**

  **Develop Effective Teacher Leadership Framework for Gifted Education**
Definition of Terms

The following definitions will be used for the purposes of this study:

**Bloom’s Taxonomy** refers to the classification of the goals of education regarding the development of intelligence within three categories or domains: the cognitive domain (emphasizing mental processes), the affective domain (emphasizing feeling and emotion), and the psychomotor domain (emphasizing motor skills).

**Collaboration** refers to the pooling and collection of teacher’s knowledge, expertise and capacities within a subject area, and thus increase teachers’ opportunities to learn from each other resulting in multiplication effect, where teachers can stretch across between classrooms, between subjects and schools.

**Deductive Approach** refers to a concept or principle then develops it with facts.

**Differentiated Instruction** refers to the process by which several different learning experiences are offered to students within a lesson or series of lessons designed to meet students’ varied needs or learning styles. Also refers to as “individualized” or “customized” instruction.

**Distributed Leadership** refers to a theory that re-conceptualizes the role of leader. It involves the participation of multiple people who take effort in guiding and mobilizing others to bring about effective changes in and beyond the classroom. Leadership is dispersed to multiple people and tasks are accomplished through building on each other’s experiences and knowledge.

**Effective/Accomplished Teacher** refers to teachers who coordinate regular curriculum activities so that gifted students can work at a pace that commensurate with their ability. This means that an accomplished or effective teacher of the gifted student must be knowledgeable
about current innovative instructional practices and have the skills to design curriculum activities suitable for the gifted population.

**Effective Teacher Leadership** refers to the teacher leadership practices that can contribute to pedagogical excellence in classrooms, hence higher student achievement.

**Gifted Education** refers to special services, practices, theories, procedures, and policies used in providing for the unique needs of gifted students.

**Gifted Students** refer to students who display evidence of high performance capability in areas such as intellectual, creative, artistic in specific academic fields, and who require learning activities that are challenging in order to fully develop their capabilities. In this research, the focus on “gifted” is on the academic fields of science, math and technology.

**Inductive Approach** refers to the analyses done on pertinent facts to generate a concept or principle.

**Informal Teacher Leadership** refers to leadership exercised by teachers regardless of position or designation, also known as “invisible leadership”.

**Pedagogical Excellence** refers to achieving success in the application of a repertoire of teaching and learning strategies to activate optimal learning in students through the understanding of the body of knowledge on how learner’s learn and their underlying theories.

**Problem-based Learning** refers to a learning principle where students are immersed in real-world, complex situations in their learning of the curriculum whereby open-ended problems are posed to challenge students to think of the many ways of solving a problem.

**Professional Development** refers to a comprehensive, sustained, and intensive approach to improving teachers’ effectiveness in raising student achievement. Effective professional development is based on a model of continuous improvement, and should directly impact a
teacher’s classroom practices and student achievement. Every educator should be engaged in professional learning at the school as part of the workday.

**Professional Learning Community (PLC)** refers to a situation when a school engages the entire group of professionals in coming together for learning within a supportive, self-created community."

**School Climate** refers to a characterization of the internal climate of the school that encompasses school’s atmosphere, tone, the personality or ethos of the school.

**School Leaders or Principals** refer to people in position of leadership within an educational institutional.

**School Leadership** refers to the type of leadership displayed by the school administrators or principals who lead and manage the school.

**Teacher Leader** refers to a teacher who assumes formally or informally one or more of a wide array of leadership roles to support school and student success. Teacher leaders model continual improvement, model lifelong learning, and use what they learn to help students achieve.

**Teacher Leadership** refers to the process by which teachers, individually or collectively; influence their colleagues, principals, and other members of the school community to improve teaching and learning practices with the aim of increased student learning and achievement.

**Transformational Leadership** refers to leaders displaying charisma, trustworthiness, creativity, and high levels of articulation skills, and their exceptional communication skills allow them to navigate through their organizations with positive self-assurance.
Scope of the Study

The scope of this study is to explore teacher leadership practices that would contribute to the improvement in teaching and learning of students in gifted education in Thailand. This study will focus on the teachers in the government-designated school established since 1990; Mahidol Wittayanusorn School (MWITS). The research instrument will be administered in January, 2014 with all teachers, without any subject expertise discrimination, and with both local and international teaching staff.

Significance of the Study

The significance of this study is to highlight effective teacher leadership practices as means of achieving pedagogical excellence in classrooms for the gifted. There is a growing understanding of what teacher leaders can do to make contributions to school leadership (Crowther et al., 2002; Katzenmeyer & Moller, 2001, Smylie, 1995; Wasley, 1995). By empowering teachers to become leaders, the meaning of school leadership gets expanded to cover a broader definition that can include all members of the school (Blasé & Blasé, 2001; Lambert, 1998, 2003). The focus of this study will primarily be on the role of teachers as pedagogical leaders, who work to improve student learning on a school-level, not limited only in their classrooms, but beyond the classroom walls.

Overall the study will have a great significance on the practice of educational leadership and it is the desire of the researcher to see the emergence of effective teacher leadership practices that can contribute to the body of knowledge and serve as an effective guideline to school administrators and all teachers; gifted and non-gifted programs. Beyond that, the teacher
leadership practices can be a timely tool in aiding the development of pre-service and in-service training programs for potential and current teachers for the gifted, and other general education schools keen in achieving good pedagogical practices as part of the country’s effort in rethinking educational reform strategies, especially in its move to improve the quality of teachers and teaching.

**Delimitations**

This study included a purposive sampling of high school teachers in a gifted high school located in Nakhon Pathom, a district approximately 30 kilometers from the capital, Bangkok. Students will not be the subject under investigation as it is the researcher’s opinion to try to contain the output of the study as best possible as opinions from the students may be bias due to Thai cultural issues such as a high respect for their teachers. Hofstede (2009), in his cultural dimension theory, found Thailand to display high power distance index (PDI), as with most of the Asian countries. Power distance as defined by him refers to “the extent to which the less powerful members of institutions and organization within a country expect and accept that power is distributed unequally”, therefore being respectful to the elders is a natural norm conformation which may intervene with the study’s outcome.

The school was selected as it is the first and only national high school that was established by the government in 1990 to serve the gifted needs of students good at science and mathematics, hence would be an appropriate representative sample of a gifted school. The gifted program is holistically implemented on a school-wide level. The school holds the country’s largest group of gifted students at a total of 720 annually, distinguishing itself from the other regular schools where only one or two classrooms are designated as “gifted”. Besides
that, the school’s curriculum is designed by leading external science experts and university professors, and is specially monitored and in accordance with the curriculum set by the Institute for the Promotion of Science and Technology (IPST).

Limitations

The following issues were considered limitations to the study: potential on-going bias due to the researcher’s close affiliation with the school; hence the interview responses may have been subjected to the researcher’s own interpretation. Furthermore, since the issues under school leaders were limited in this study; as the primary focus was on teacher leadership, it is therefore inconclusive to form any valid conclusion on the moderately rated construct of distributed leadership that has been perceived by teachers as being less visibly-present at the school.
CHAPTER II

REVIEW OF THE LITERATURE

This research is guided by the scholarly professional literature on teacher leadership and how it can contribute to achieving pedagogical excellence in a gifted school. The literature review consists of two major areas (teacher leadership and gifted education) that provide a conceptual framework for the study. As the purpose of the study was to explore teacher leadership in gifted education, various research from the past pertaining to these areas will be presented to understand the phenomenon under study.

Part I comprises discussions under the area of teacher leadership: first, is the rationale of teacher leadership, followed by the impacts of teacher leadership on school improvement and the structure that will facilitate the emergent of teacher leaders. A report will then highlight the substantial number of research that has been carried out on teacher leadership. This will then be followed by two leadership theories that would facilitate teacher leadership, namely distributed leadership, which is considered an application of how teacher leadership may be achievable, and its related literature. Then a discussion will ensue on the second leadership theory, which is the essentiality for teachers to assume transformational leadership in classrooms to achieve sustainable teaching exchanges with peers, and learning outcomes with students.

Part II will comprise discussions under the area of gifted education. First, the historical perspectives of gifted education will be examined, which include an honorable mentioned of some of the major contributors in this field of gifted. This will be followed with the related research findings on gifted education. Some background information about gifted education in Thailand, more specifically, in the case of Mahidol Wittayanusorn School will then be
presented. Next, is the discussion on the key characteristics of gifted students so that teachers would be able to recognize and understand the cognitive and emotional needs of these students so as appropriate pedagogical knowledge and instructional strategies can be implemented to achieve pedagogical excellence. The final discussion will examine the two learning principles pertinent to how gifted students learn; Bloom’s Taxonomy of the Cognitive Domain and Problem-based Learning.

Part I: Teacher Leadership

Rationale for Teacher Leadership

As initiatives to reform the educational system have emerged, one significant line of work points to teachers assuming greater leadership roles within their school organizations. According to Murphy, 2005, many studies have consistently identified teacher leadership as a critical component to the improvement on student achievement. Sergiovanni (1994) also asserted that „the sources of authority for leadership are embedded in shared ideas” (p.214), not in power of position. For the past two decades, York-Barr and Duke (2004) found that teachers have been assuming more leadership roles in instruction and organizational decision making.

Through teacher leadership, teachers perform both teaching and leadership duties. Katzenmeyer and Moller (2001) outlined three areas of leadership that teachers can undertake. First, teacher leaders may assume leadership roles with students and colleagues in connection with teaching and learning. York-Barr and Duke termed this leadership function as participation in school change or school improvement (Berry & Ginsberg, 1990; Crowther et al., 2002; Darling-Hammond, 1996; Hart, 1995; Heller & Firestone, 1995; Paulu & Winters, 1998; Silva...
et al., 2000). Second, teacher leaders may be involved in operational tasks within or outside of school, which could be inferred as parent and community involvement. Lastly, teacher leaders may participate in the decision making and governance aspect of the school, which York-Barr and Duke referred to as coordination and management (Heller & Firestone, 1995; Smylie & Denny, 1990; Wasley, 1990).

In this study, the focus of teacher leadership will be on the first functional role as mentioned by Katzenmeyer and Moller (2001), whereby teacher leaders assume leadership roles with students and colleagues in connection with teaching and learning. This teacher leadership function is pertinent as it draws on the teacher’s expertise and experience to bring about lasting and effective pedagogies to teaching and learning.

Teachers are considered an underutilized resource. Tyack and Cuban (1995) argued that until recent years, „teachers do not have a monopoly on educational wisdom, but their first-hand perspectives on schools and their responsibility for carrying out official policies argue for their centrality in school reform efforts” (p.135). Foster (2004) and Hart (1995) contended that by involving teachers in roles of decision making processes and giving them a voice in matters related directly to their teaching and learning, schools are able to use them to bring about more effective reforms that are based on their classroom experience and curriculum knowledge. Tyack and Cuban (1995) referred teachers as „street level bureaucrats,” with teachers typically having a large level of discretion to make instructional decisions about students once the classroom doors close.

The teacher leader role ascribed by Katzenmeyer and Moller shares similarity with Yoke-Barr and Duke (2004)’s own definition of teacher leadership: „a process by which teachers, individually or collectively; influence their colleagues, principals, and other members
of the school community to improve teaching and learning practices with the aim of increased
student learning and achievement.” The same teacher leader function shares consistency with
Silva et al.”s (2000) description of the third wave of teacher leadership. In his third wave of
teacher leadership, it explicitly introduces the idea that „teacher leadership is a process within
the transformational realm of leadership.” Simply put, teachers help other teachers to improve
their professional practice by stretching them to lead at the school-level, such as redesigning the
school, mentoring colleagues, problem-solving, and engaging colleagues in professional growth
activities (Pounder, 2006, p. 533). Likewise, the consistency is also found in O’Hair and
Reitzurg”s (1997) definition of teacher leadership, one that takes on the extension of the
democratic function of school leadership. This supports the notion that if schools are to support
democratic values and help students learn to be critical and active citizens, then they should
walk the talk. These schools should model democracy through democratic leadership (Hackney
& Henderson, 1999; Hart, 1995; Katzenmeyer & Moller, 2001). Students need to be able to
observe and experience democratic leadership where all members have a voice and are allowed
to exercise their leadership potential (Barth, 2001b; Frost & Durrant, 2003). The emphasis is to
promote an all-inclusive school culture whereby the consequences of democratic leadership will
spill over to both teachers and students.

There have been extensive literature and positional papers that promote teacher
leadership structures as a vital component of school improvement (Frost & Durrant, 2003;
Pellicer & Anderson, 2001). Even though the definitions are described in varying forms, they
do overlap as seen in the preceding paragraph. Teacher leadership proponents have provided
many reasons for implementing teacher leadership in schools (Barth, 2001b; Frost & Harris,
following section will discuss some of the more consistently mentioned teacher leadership practices derived from the literature.

**Teacher Leadership Practices**

The following are the major practices of teacher leadership that were identified as fundamental to the success of school improvement: (a) Relationship and Influence, (b) Collaboration, (c) Professional learning communities, and (d) Professional development.

**(a) Relationship and influence.**

The first and foremost key practice of teacher leadership is relationship and influence. Crowther et al. (2002) clearly stated that in order for teachers to be regarded as leaders they need to be viewed as confident, competent and approachable by their colleagues. The task of sharing expertise with one another is therefore, simply not about enforcing some ideas on others, but, as Forster (1997) and Wagner (2001) pointed out, is to engage in a process that allows others to discover how they can improve their own practice.

Sirotnik and Kimball (1996) as quoted by Leithwood et al. (1998) stated that leadership means the exercising of influence over the beliefs, actions and values of others. Leadership does not take on a new meaning when qualified with the word „teacher”. Katzenmeyer and Moller (1996; 2001) postulated that since teachers seldom find themselves in situations that give them position power; it is their individual power of establishing good relationship and influence that gives them an edge.

Keedy and Finch (1994) distinguished between power as dominance over someone and power as exercised through another individual. Obviously, the latter prevails and the authors
expanded to suggest that power is associated with the need to influence others for the overall good of the organization. However, without the support from the school leader, teachers will find it hard to influence their colleagues. On the other hand, when school leaders empower teachers to support one another in their teaching and learning activities, an interactive and nurturing environment will permeate. Hargreaves (1998) maintained that the emotional status of teaching requires a stable, secure environment in order for teachers to actually influence one another that will impact their teaching.

Good relationship and influencing skills can be exercised in many ways; being good listeners, modeling good behavior, and more importantly, skillful teachers have to learn to work effectively in teams. Katzenmeyer and Moller (2001) suggested that working as teams can either happen naturally or through training sessions. Teacher leaders have to learn how to work in a group to solve problems, make decisions and manage the inevitable conflicts. Facilitating discussions, taking down all ideas from the group are methods that teacher leaders can use to influence the group. These are the types of skills that will develop when teachers work collaboratively to influence each other’s practice.

Avolio and Gardner (2005) stressed on the importance of leading by example or walking the talk. Besides possessing exemplary teaching behavior, teachers that can influence their colleagues also display transparency in their decisions, confidence, optimism, hope, resiliency, and consistency between their words and deeds. Avolio (1994) claimed that leaders that exercise idealized influence when they serve as role models, exhibit behaviors and attitudes required to earn trust and respect in followers.
(b) Collaboration.

The second practice of teacher leadership is to encourage a culture of collaboration. Hargreaves and Shirley (2012) clearly stated in their book, *The Global Forth Way. The Quest for Educational Excellence*, that the old „individual autonomy” should be reinvented to „collective autonomy”, where teachers should uphold strong commitment to shared responsibility, and rigorous inquiry into innovation and improvement. The authors call for teachers to get out of the shadows of their professions in order to lead. Teachers no longer need to wait for the principal’s or department head’s initiative to get started. Therefore, teacher collegiality and collaboration are necessary for generating positive changes in schools (Rosenholtz, 1989).

Harris and Muijs (2002) emphasized that „collaboration is at the heart of teacher leadership, as it is premised upon change that is enacted collectively” (p.7). The authors contended that through collaboration, teachers” knowledge, expertise and capacities within a subject area are pooled and collected. This positive culture of collaboration increases teachers’ opportunities to learn from each other resulting in multiplication effect, where teachers can stretch across between classrooms, between subject areas and between schools. The holistic view on collaboration is that, it is synergetic, allows exchanges between teachers, and opens boundless opportunities for continuous improvement and learning from teachers. For schools to be effective, teachers must be allowed to lead as this fosters them to be more innovative, open to sharing ideas, and learn together (Hart, 1995; Hatch, White, & Faigenbaum, 2005; Rosenholtz, 1989).

Fullan and Hargreaves (1996) emphasized that the most powerful effect of teacher collaboration is teacher’s commitment and student learning. Once collaborative relationships
are forged, teachers feel more confident, uncertainties are removed, and teachers do not feel that they are working in isolation, resulting in a supportive culture that may lead to a shared approach to pedagogy. Through exchanges between peers, teachers gain knowledge as well as vital teaching and learning techniques, all leading to positive pedagogical practices in classrooms.

Since collaborative relationships are the highest form of relationships (Little & McLaughlin, 1993; Turk et al., 2002) as seen in the literature discussed above, it has to however be nurtured over time, where the moral purpose associated with teaching will fuel the process. Lieberman (1994) observed that when teachers view collaboration as an opportunity to learn, the motivation to get involved becomes strong. More importantly, as Wagner (2001) pointed out, interaction is rooted in commitment and not compliance. He also cautioned that there is a need to consciously combat negative relationships that exist in schools, where feelings of hopelessness (Hargreaves, 1998) and lack of respect have developed.

Weiss et al. (1992) mentioned that professional dialogue and exchange is definitely a new territory for many teachers. This is because in general, relationships between peers are more congenial than collegial, and the shift to engage with other adults on issues such as learning, negotiating, resolving differences, coupled with making decisions collaboratively are relatively new experiences for teachers. Most schools’ culture has so far been traditional and inhibiting, and teachers have not been set-up to influence teaching. Little (1998, 1990) supported by stating that, in most cases „teachers are far less likely to defer to another teacher’s view of curriculum or instruction than to rely on habit and personal preference.” Hargreaves (1998) stressed on the importance of weighing the emotional effects of teaching. „When teachers try out new practices or ask colleagues for help as they seek to make their work more
effective, they place their confidence and perceived competence on the line.” So, when collaboration and trust are in place, these occurrences are perceived as non-threatening to teachers. A high priority is therefore needed to re-culture schools as collaboration has proven that it does bring positive impacts between colleagues and is indeed a means of enhancing professional relationships among educators.

(c) Professional learning communities (PLC).

The third practice needed for teacher leadership to emerge is to facilitate communities of professional learners. A seminal study initiated by Rosenholz (1989) in the 1980s introduced the gap that exist in teachers” professional lives as his findings evidenced teachers were more committed and effective in the classroom practice when they were supported in their own ongoing learning against those that did not receive such support. He found that teacher networks, cooperation between peers and expanded professional roles all led to an increased in teachers” efficacy in meeting students” needs. McLaughlin and Talbert (1994) confirmed Rosenholz”s findings, and together suggested that when teachers have opportunities for collaborative inquiry and related learning, they are able to develop and share a body of wisdom from their classroom experience. Similarly, Darling-Hammond (1996) reaffirmed that the core component of the transformation of teaching roles in schools and towards the establishment of professional learning communities (PLC), was shared decision-making.

According to Morrissey (2004:4), the term „professional learning community” defines itself: „A school that engages the entire group of professionals in coming together for learning within a supportive, self-created community.” Earlier researchers, Mitchell and Sackney (2001) and Toole and Louis (2002) defined PLC as a group of people sharing and critically
interrogating their practice in an ongoing, reflective, collaborative, inclusive, learning-oriented, and growth-promoting way. Harris and Muijs (2005:47) emphasized that to build a „learning community” to promote increased student learning requires more of teachers than just a matter of „gathering people together”. There are constructs such as shared purpose, mutual regard, caring and integrity which are intertwined in the purpose of the community. The authors elaborated to say that there are three components to making the learning communities workable. First, there must be trust among members of the community, second, the learners must possess knowledge of what issues and tasks are needed to be addressed to move the school forward, and third, the leadership capacity to undertake the necessary work in ways that permit modification and encourage reflection. Toole and Seashore-Louis (2002:5) noted that professional learning communities encompass three robust yet simple-to-understand concepts: 1) professionalism, which they clarify as „client-orientated and knowledge-based” (Darling-Hammond, 1990); 2) learning – that places a high value on teacher professional development (Toole, 2001); and 3) personal connection (Louis & Kruse, 1995).

Harris and Muijs (2005) contended that a professional community is one in which teachers participate in decision making, have a shared sense of purpose, engage in collaboration and accept joint responsibility for the task outcome. This would promote pedagogical improvement as teachers can improve their practice by developing and refining new instructional practices and methods with their fellow learners in the community. Crowther et al. (2002) revealed that when teacher leaders are engaged in professional learning communities, they derive strength and confidence from one another, hence building networks and form alliances, subsequently enabling the creation of new ideas, dreams and opportunities that would not have otherwise exist. Sergiovanni (2000) supported the notion of teachers as learning
leaders when he quotes “The more teachers know and the more skilled they are in teaching, the more successful schools will be in advancing learning” (p.75), and emphasized that „developing a community of practice may be the single best most important way to improve a school.”

Lieberman and Miller (1999) acknowledged that teacher should be engaged in the intellectual work of lifelong learning through inquiry and reflection. Positive behaviors that emerge from PLCs, such as encouraging teachers to take intellectual risks, re-examine assumptions, looking at their own work from new lenses, rethinking how it can be performed (Avolio, 1994; Podsakoff, Mackenzie, Moorman & Fetter, 1990), all contribute to good effects on students. Waters, Marzano and McNulty (2003) concluded that the challenge the status quo are among practices that contribute to leaders” effects on students. Kennedy et al. (2011) in their findings, asserted the benefits of building a culture through dialogue and inquiry. Their research leads to suggestions that when adults in a school continually engage in dialogue and inquiry to support student learning, a re-culturing takes place. Consequently, from this re-culturing, teachers take risks and tolerate a level of vulnerability in order to learn and enact productive change. Kennedy and his colleagues found that teams that exhibit a spirit of inquiry by continually asking questions on data and of each other produced a more synergized collaboration which is made more powerful by individuals working in concert with one another to deepen their understanding on core instructional practices. Also, in the findings, one teacher under study described the work as shifting from focusing on „my kids” to focusing on „our kids.” Ultimately, for dialogue to work in the service of collaborative inquiry, team members must adopt and practice norms of collaboration. These norms become normal when members commit to them and regularly reflect upon them (Garmston & Wellman 2009).
Harris and Muijs (2005) indicated that the main rationale for the development of professional learning communities in school lies in the link between organizational change and pedagogical change. Little empirical evidence existed to connect the two, but the authors point out that an increasing number of studies have demonstrated the connection between establishing such learning communities with „deep teacher change” (Toole & Seashore-Louis 2002: 12). Findings as cited by Rosenholz (1989) also highlighted that instruction is more effective in schools where professional learning communities reside. More importantly, the significant positive effects are witnessed on student learning. In a high school study, Wiley (2001) found that individual student achievement in math was positively affected by an increased learning in school resulting from professional community, but only in schools where teachers experienced above-average transformational leadership.

Thus far, the argument for the establishment of professional learning communities is compelling due to its positive impact on students’ learning. Hargreaves (2003) supported this when he posited that „professional learning communities lead to strong and measurable improvements in students’ learning. Instead of bringing „quick fixes” or superficial change, they create and support sustainable improvements that last over time, they build professional skills and the capacity to keep the school progressing.“ (p.3)

Newman et al. (2000) on their recent study on effective schools concluded that building school capacity is the key to success and that forging professional relationship between teachers where they work and learn together is central to sustaining school effectiveness. Teachers tinker with their practice (Hargreaves, 1999; Huberman, 1983). There is an expectation that through teacher-exchanges, some practices can be replicated, and teachers tend to adapt them (Berman & McLaughlin, 1977; Datnow, Hubbard & Mehan, 2002) to fit their own classroom context.
Other outcomes resulting from effective PLCs are transfers of good/best practice” to one another. The intention of PLC is and should always be on the exchange and practice creation, whereby exchange sees one teacher as the originator and the other the receiver, while practice creation sees exchanges between teachers that result from the inspiration, and energy derived from one another from their dialogues to create a new practice (Fielding, Bragg, Craig, Cunningham, Eraut, Gillinson, Horne, Robinson, & Thorpe, J., 2005).

Harris and Muijs (2005) acknowledged that for a school to show likely improvement, development must be undertaken at both school and departmental level. Schön (1983), and Cochran-Smith and Lytle (2009) argued that by weaving together multiple sources of knowledge, practitioners are able to potentially create useful knowledge beyond their own settings; teachers can draw on other teachers’ knowledge, as well as refining their own to improve knowledge. Therefore PLCs should be nurtured and encouraged. Schools need to recognize the power of influence of departments on teachers. Hence this would infer that all teachers have a role to play as leaders as they are the change agent closest to the classrooms.

(d) Professional development.

The final practice of teacher leadership involves professional development of teachers. Professional development is as Harris and Muijs (2005) explain, is related to people’s professional identities and the roles and the goals of the organization where they work. It can encompass a wide variety of approaches, and teaching and learning styles in both inside and outside of schools. The authors further stressed that professional development is the sum total of both formal and informal learning pursued and experienced by the teacher, often under conditions of challenge.
Over the years, research literature has singled out professional development as an essential component of successful school-level change and development (Hargreaves, 1994). It reasserted that when teachers are able to reflect, and access new ideas, experiment and share experiences within the school, and with leaders who encourage appropriate levels of challenge and support, there is greater potential for improvement on school and classroom levels. Compelling evidence also support that improvements in student learning and achievement are positively related to the amount of attention given to teacher learning. The direct impact is attributed to improved teacher quality, with teachers having clearer professional identities, and with both intrinsic and extrinsic rewards given for their work, they become more satisfied and committed, hence are able to expand and develop a wider repertoire in their teaching in meeting the needs of their students. Harris and Muijs (2005) stressed that continuous professional development can have a positive impact on curriculum, pedagogy, teachers’ sense of commitment and their relationships with students. They mentioned that if the use of the new practices is to be sustained and changes are endured in schools, then teachers need professional development that engages them collaboratively and meaningfully. Through collaboration, teachers feel less isolated as well as their quality of work gets enhanced. Therefore, being a part of a professional development community helps focus attention on the school’s shared purpose and the goals that lead to school improvement.

Continuing professional development in schools is increasingly seen in various literature as an instrumental part of the career development of teachers. It is also seen as a tangible expression of their commitment to learn, and is essential if professionals at every level in the school are to remain up to date in their knowledge of the curriculum, be wise in their selection
and use of a repertoire of pedagogical skills, be enthusiastic about their work and the student they teach, and be self-confident and clear about their purposes (Harris & Muijs, 2005).

There is often a gap between talking about new ways of teaching students and actual implementation of the new strategies in the classroom. Barth (2001b) believed that the first step in reforming the learning experiences of the young people is to reform the learning experiences of the adults responsible for the young people’s education. He quoted Albert Schweitzer who said „example is not the main thing in influencing others, it is the only thing” (p.75). The coaching role that is described by Guiney (2001) delineated how the integration of teachers’ learning and teachers’ practice created a process whereby teachers adopted new strategies that they felt would improve student learning in their classrooms, therefore, continuous professional development must be supported by school leaders and principals.

While it is recognized that teachers’ professional development needs will vary according to personal and professional histories and current dispositions of these individuals, the matching of appropriate professional development provisions to particular needs is therefore vital if effective learning and positive impact to the school are to take place.

Related Research on Teacher Leadership Impacts on School Improvement

Despite inconclusive findings from research that links teacher leadership to student achievement, there are some consistencies in scholarly opinions and data collection that teacher leadership does have a positive effect on teacher’s morale, professionalism, school reform, and school culture. The studies below are research findings synthesizing the advantages connected with teacher leadership.
Weiss (1993) in his longitudinal study of twelve high schools in eleven states, revealed that increased teacher participation in school leadership generate a sense of ownership, advances professionalism, and allows for greater control over the decision process. In the study where he observed the schools for an average of seventeen months with 193 structured interviews, he found that half of the schools had structures for teacher participation in school decisions, and the remaining half had a formal position-led structure. Interestingly, he found that high teacher participation did not necessarily lead to teachers being more focused on student issues or being more innovative. On the contrary, it led to better teacher morale, strong commitment to change, and increased professionalism. Weiss cautioned that though the sampling may have delimited his study, he noted favorable outcomes of teacher leadership.

Another study conducted by Silva, Gimbert, and Nolan (2000) pointed to teacher leadership resulting in improved relationships, professional growth, and greater acceptance of change for those employed in the school. The case study was conducted with three identified teacher leaders who worked in a school in the northeastern part of the United States. Similar to Weiss, because of the shortcomings in the small number of study participants, the researchers revealed that teacher leadership may have a positive impact on both teachers and schools by helping to „reculture“ (p. 780) schools and allowing teachers to meaningfully participate in school organization.

In a study carried out by Lieberman et al. (2000) on 17 teacher leaders, it was found that the teachers felt the experience had improved their confidence in their own abilities, and had taught them to motivate, lead and encourage their colleagues. Likewise, in another survey of 42 teacher leaders, O’Connor and Boles (1992) reported improved self-confidence, increased knowledge and an improved attitude to teaching.
High and Ovando (2002) conducted a case study on a Texas elementary school that was carrying out faculty-led reforms to improve student achievement. The researchers followed a group of 30 full-time teachers and used focus groups discussions. Findings obtained revealed that when teachers were faced with the challenge to improve student achievement, they engaged in teacher leadership and were observed to generate strategies that led to successful school reform. The researchers measured the student success on the Texas Assessment of Academic Skills in the two years the case study was conducted. Despite having limitations due to its small sampling, it was found that the strategies teachers developed and applied in the study included collaborative leadership, shared vision, commitment to change, consistency of best practices, time management, and parent information. The researchers found that teachers developed a perception that they can work together and adopted a „we” mentality rather than a „you” mentality.

Weiss and Cambone (1994) in their longitudinal case studies of six schools, noted that in cases where leadership was shared with teachers, school reform were implemented more slowly but it was generally accepted and implemented by all, whereas in no non-shared management schools, resistance persisted.

In two studies conducted by Helm (1989) and Leithwood and Jantzi (1990) where shared leadership was encouraged by the school leaders, saw the participation from teachers in decisions making and school development. The shared leadership highlighted the following:

- distributing the responsibility and power for leadership widely throughout the school;
- shared decision-making power with staff;
- allowing staff to manage their own decision-making committees;
- taking staff opinion into account;
- ensuring effective group problem solving during meetings of staff;
- providing autonomy for teachers;
- altering working conditions so that staff have collaborative planning time;
- ensuring adequate involvement in decision making related to new initiatives in the school;
- creating opportunities for staff development.

The positive impacts of teacher leadership on school improvement have been clearly identified within the numerous literatures on teacher leadership. However, not many research have been carried out on their direct relationship with student achievement.

**Distributed Leadership**

The appearance of distributed leadership reflects a change in thinking about school leadership. Distributed leadership is referred as an application of how teacher leaders can emerge. The long-held conceptions of leadership, a singular figure with charismatic and heroic qualities at the hierarchical top are a notion no longer sustainable with the increased complexity in today”s educational system. The sentiment is shared by Hulphia and Devos (2009) when they aptly stated that today”s leadership is no longer restricted to the traditional „superhero” leadership model, which holds that leading a school is a one-person business. In large schools especially, it becomes probable that no one individual has all the knowledge, skills, and abilities
that would enable him/her to accomplish all the leadership functions, without distributing them among a team. Conger and Pearce (2003) pointed to a post-heroic leadership model that has been developed, and in this model leadership is seen as a group-level phenomenon where leadership is distributed among members of the school team. Although distributed leadership is a new kid on the block (Gronn, 2003) and as Harris (2008) coined it as „en vogue”, empirical research exploring distributed leadership from a descriptive perspective and the examining of its relation to school effectiveness and improvement is still in its infancy.

Harris (2002) called distributed leadership as a „form of collective leadership where leadership is distributed throughout the school community” King (1996) and Griffin (1995) found that teacher leadership through distributed leadership resulted in positive effects on pedagogy, school culture and educational quality. This was due to the relationship teachers shared with other teachers and the school management. Harris and Muijs (2005) succinctly echoed that by „empowering teachers and providing them with opportunities to lead is based on the simple but profound idea that if schools are to become better at providing learning for students, then they must also become better at providing opportunities for teachers to innovate, develop and learn together.”

This distributive model supports the researcher’s intention to focus on a bottom-up approach of the process of all teachers becoming teacher leaders as opposed to the hierarchical structure of one leader (top-down approach). Equating leadership with status, authority and position is a traditional notion of school leadership that needs re-conceiving. This notion is strengthened by one of the most congruent findings from recent studies of effective leadership, that highlighted that, the authority to lead need not be located in the person of the leader but can be dispersed throughout the school, between and among people (MacBeath 1998; Day et al.
In this sense, leadership is primarily concerned with the relationships and the connections among individuals within the school.

Distributed leadership promotes and engages fellow teachers in collegial ambience and is non-traditional leading. Besides re-conceptualizing the role of the traditional leader, it involves the participation of multiple people who take effort in guiding and mobilizing others to bring about effective changes in and beyond the classroom. Leadership is therefore spread to multiple people and tasks are accomplished through building on each other’s experiences and knowledge (Spillane, Halverson, & Diamond, 2001). When this happens, the school leader or principal continues to be ultimately responsible for the overall performance or the school, but the role of the principal changes. McGhan (2002) stated that school leadership is a fluid relationship between multiple leaders and followers, involving varied situational and social contexts, and Harris (2002) plainly put it as „maximizing the human capacity within the organization”

Leithwood and Reil (2003) reiterated that „research suggests that teacher leaders can help other teachers to embrace goals, to understand the changes that are needed to strengthen teaching and learning and to work towards improvement”. Harris and Muijs (2005) pointed out that far too often teachers have worked in their own individual classrooms lacking any productive interaction with colleagues from whom they may gain new insights and understandings about their practice. The authors further stressed that the overarching message about successful school improvement is one of building a community of practice that offers an infrastructure to support teachers leading and learning from each other.

Harris and Lambert (2003) postulated that distributed leadership extends the boundaries of leadership significantly as more high level teacher involvement and decision making take
place. It encompasses a wide variety of expertise, skill and input in the process and practice of leadership. Many studies have also point to the clear evidence of the positive effect distributed leadership has on teachers’ self-efficacy and morale. (Greenleaf 1996; MacBeath 1998; Mitchell & Sackney, 2001). Little (1990; 2000) in his research findings showed that where teachers share good practice and learn together, the securing of quality teaching is ascertained. This supports that collegiality and collaboration are at the core of distributed leadership. However, Harris and Lambert (2003) cautioned that not all collaborative activities will necessarily generate distributed leadership, as it also depends on the level and quality of involvement plus the degree of skillfulness with the group. More importantly, distributed leadership can work only when internal conditions of the school allows it, which means if the formal leadership supports and nurtures collaborative learning, we will experience a paradigm shift of leadership from formality to leadership by informality, driven by purpose and initiatives. Therefore, it is vital that formal leaders in schools orchestrate and encourage leadership to be dispersed and create the „shelter conditions” in harnessing conditions for collaborative learning.

A cautionary note however is that like teacher leadership, most educational literature concerning distributed leadership is theoretical in nature with scholars calling for the reorganization of school leadership structures if school reform is to happen (Elmore, 2000; Harris 2002; Lashway, 2003; Leithwood & Jantzi, 1998). Some research carried out by Silins and Mulford (2002) revealed that student outcomes are more likely to improve where leadership sources are distributed throughout the school and where teachers are empowered in areas of importance to them. Similarly, Leithwood and Jantzi (2000) concluded that evidence from studies suggests that principal leadership does not stand out as a critical part of the change
process but that teacher leadership does have a significant effect on student engagement. The study was conclusive in its findings that through the distribution of a larger proportion of current leadership activity to teachers would result in „a positive influence on teacher effectiveness and student engagement“

There were other research findings that suggest that empowering teachers to take on leadership roles enhances the self-esteem and work satisfaction, which in turn leads to improved performance as a result from teachers feeling highly motivated, subsequently, possible greater retention in the teaching profession (Ovando 1996; Katzenmeyer & Moller 2001).

**Related Research on Distributed Leadership**

Polite (1993) conducted a case study on a middle school in Missouri and found that the school had both informal and formal teacher leaders distributed throughout the school and the teachers took upon themselves to influence the type and rate of change in the school. He also found that these leaders were frequently making decisions either alone or in a group and it was through distributive leadership that resulted in an increase in staff involvement, emphasis on instructional issues and a greater level of professional development. The findings highlighted that a more distributed leadership structure can lead in more effective long-term change in the school. However, since the sampling was small, the evidence had significant limitations.

In 1997, Leithwood, Jantzi, Ryan & Steinbach conducted a mixed method study on 2,727 elementary and secondary school teachers in a large district. His assessment was on the perceptions teachers had on distributed leadership structure that existed in their schools. His
findings showed that both principal and teacher leadership played significant influence on the school culture, information collection and decision making. Later, Leithwood et al. (1997) conducted a qualitative study with six secondary schools and interviewed the individual teachers about their colleagues that they have nominated as leaders. The results of the interview highlighted certain characteristics of teacher leaders that were consistent: warm, dependable, self-effacing with a genuine commitment to the work of colleagues and of the school. It also demonstrated that the teacher leader has strong interpersonal skills with broad knowledge on education policy, subject matter, the local community and students. The teachers that were interviewed emphasized that the teacher leader has the skills to bring about program improvements and is an active participant of leadership tasks of the school.

The findings from the study above reinforced previous research findings that were consistent with the literature, because its results pointed to distributed leadership structures can lead to stimulated professional growth (Wasley, 1991) and improved decision making for schools (Malen, Ogawa, & Krantz, 1990). However, there were limitations to both these studies as the former mixed method study had administered a structured interview with teachers from a large sample but from one large district. The instrument used to collect data was also an instrument that was developed for a much larger study. Because of the large number of items required for the larger study, a matrix sampling was used to create different versions for surveying the elementary teachers and four different versions for surveying the secondary teachers.

A year later in 1998, Leithwood et al., did a follow-up study to measure student engagement in 110 schools, in which they used the same data set but expanded their sample to include students; 6,490 elementary students and 2,535 secondary students. The data collected
involved information about principal and teacher leadership, school conditions, student engagement, and family educational culture. The data collected was used to investigate the relative influence of leadership of principals and teachers on schools and students and the influence of distributed approach of leadership. In contrast to previous studies, the results of the study were slightly less supportive of the distributive leadership model. The researchers found that neither principal leadership nor teacher leadership had statistically significant effects on student engagement when the family educational culture variable was included in the analyses. Although the researchers found that teacher and principal leadership largely exert the same level of influence on school and classroom conditions, it was noted that distributing leadership throughout the organization can have non-significant results on student engagement and school culture. Leithwood et al. (1997) concluded that “more is not always better” and recommended that schools might benefit most from leadership of a small number of easily identifiable sources. The limitation of the study was consistent with the previous study whereby it utilized the same survey and data was collected from one large district. Moreover, the student outcome measure was not student achievement, but student engagement, and the data was aggregated on a school level, which assumed that leadership was perceived the same way by all teachers in a school.

In 2002, Burke conducted a case study that examined a junior high school in Massachusetts that changed from a junior high to middle school model. The findings showed that the school achieved a smooth successful transition due to shared, or distributed leadership structure that the principal established in the school. Distributed leadership was found to cause collaboration, new patterns of behavior, and changed expectations of what rigorous academic curriculum and assessment looked like. Although, the study focused on one school, Burke
found that the dispersed leadership resulted in lower suspension rates, higher attendance, increased student achievement reflected in both grades and standardized state test, and expanded academic support of students.

Despite many literatures on distributed leadership being theoretical in nature with proponents of the leadership model calling for greater distribution and empowerment to teachers in schools, some consistencies do appear. Available research has shown that school organizations that embrace distributed leadership or teacher leadership models are able to increase professional development, make better decisions and affect students effectively.

**Transformational Leadership**

A bulk of literature concerning transformational leadership has been done at the school level, and one of the most developed models of transformational leadership at school level was developed by Kenneth Leithwood and his fellow researchers in response to the lack of effectiveness that instructional leadership was having at many schools (Leithwood, Jantzi, & Steinbach, 1999; Stewart, 2006). However, most literature if any, discuss teacher leadership and transformational leadership as separate entities.

Transformational leadership as defined by Northouse (2010) is where leaders display charisma, trustworthiness, creativity, and high levels of articulation skills. Their exceptional communication skills allow them to navigate through their organizations with positive self-assurance. Burns (1978) defined transformational leadership as a process of engaging with others to create a connection that increases motivation and morality in both the leader and
follower. Transformational leaders know the capabilities and needs of their followers and attend to them in efforts to motivate and inspire them to work hard and strive for excellence.

According to Leithwood et al., (1999) transformational leadership is an appropriate approach to use in the school context as it addresses the restructuring or change needed for improvement. The researchers further elaborated that transformational leadership facilitates second order changes; changes that require new ways of seeing things and changes in basic philosophy. What is important is that the leadership enables and motivates the participation of teachers who play an important role in enacting change at the institution (Leithwood et al. 1999; Leithwood & Poplin, 1992).

Bass in 2002, emphasized about the intertwined relationship of transformational leadership and learning organizations. As adaptability is a feature of learning organizations, organizations such as schools will need to change to meet the needs of various stakeholders. DuBrin (2006) reaffirmed that the adaptability to change is necessary for any organization to survive, and by definition transformational leaders are those that can transform or change an organization.

What about in a classroom context with teachers assuming the characteristics of transformational leaders? Pounder (2006) in his article “Transformational Classroom Leadership” examined the relationship between teacher leadership and transformational leadership concepts. The author contended that a fourth wave of teacher leadership, an extension of Silva et al.’s (2000) three stages of “waves” of teacher leadership could include transformational classroom leadership as one of the defining qualities of teacher leader.

So far, few attempts if any have been made to place the notion of teacher leadership with the framework of current leadership theories. Pounder (2006) cited Crowther’s 1997 study
of teacher leadership in a socially advantaged setting as one strong exception. In Crowther’s study, the teacher leader subjects demonstrated leadership qualities that were broadly transformational in nature (Bass, 1985). He described teacher leaders as “individuals acclaimed not only for their pedagogical excellence, but also for their influence in stimulating change and creating improvement in the schools and socio-economically disadvantaged communities in where they work” (p. 6).

In order to get a clearer understanding of the characteristics found in Crowther’s subjects, the following is Bass’s conceptualization of transformational leadership characteristics:

(a) **idealized influence or charisma.** The leader provides vision and a sense of mission, instills pride, gains respect, trust and increases optimism. Such a leader excites and inspires subordinates. This dimension is a measure of the extent of followers” admiration and respect for the leader.

(b) **inspirational motivation.** The leader acts as a model for subordinates, communicates a vision and uses symbols to focus efforts. This dimension is a measure of the leader’s ability to engender confidence in the leaders” vision and values.

(c) **individual consideration.** The leader coaches and mentors, provides continuous feedback and links organizational members” needs to the organization”s mission. Individual consideration is a measure of the extent to which the leader cares about the individual follower”s concerns and developmental needs.

(d) **intellectual stimulation.** The leader stimulates followers to rethink old ways of doing things and to reassess their old values and beliefs. This dimension is concerned with
the degree to which followers are provided with interesting and challenging tasks and encouraged to solve problems in their own way (Den Hartog et al., 1997; Hinkin and Tracey, 1999).

In comparing the characteristics above with those found in Crowther’s (1997) study, a consistent set of characteristics exists and this points to the unawareness of teacher leaders of their transformational qualities. For example, their deep commitment to a set of core values that they were prepared to communicate openly resonates with the „idealized influence and inspirational motivation” dimensions of transformational leadership. Similarly, these same two leadership dimensions are reflected in Crowther’s description of teacher leaders displaying enthusiasm that was contagious, and having the ability to inspire others and raise their followers” (students) expectations.

A review of other attempts to define teacher leadership also indicates the close affinity it shares with transformational leadership. Silva, Gimbert, and Nolan’s (2000) description of teacher leaders as nurturers of relationships and models of professional growth echoed Bass’s third aspect of transformational leadership dimension; the „individual consideration”. Pounder (2006) discovered similar findings in the researchers’ account of teacher leaders as „encouragers of change, and challengers of the status quo”, as it reflects the spirit of Bass’s fourth aspect; „the intellectual stimulation” dimension. In a similar vein, Darling-Hammond et al.’s (1995) list of teacher leader qualities, where being open to new ways of doing things and the modeling of learning, all show consistency with the aspects of intellectual stimulation and individual consideration of transformational leadership dimensions. Even Berry and Ginsburg’s (1990) view of teacher leader categorizes the exact same transformational leadership characteristics.
In short, we can say that the third wave of teacher leadership as proffered by Silva et al. (2000) which integrates the notions of teaching and leadership, whereby teachers influence colleagues without the formal trappings of positions, but solely by qualities, characteristics and approaches, are truly a reminiscent of the transformational leadership constructs (Bass, 1985). Many more views such as Sherill’s (1999) where, the researcher emphasized that the core expectations of a teacher leader are exemplary classroom instruction and sound pedagogical knowledge, coupled with an understanding of the theories of learning and of effective classroom practices; Crowther’s (1997) reference to the pedagogical excellence of teacher leaders; Darling-Hammond et al.’s (1995) description of teacher leaders as “modelers of learning” and Harris and Muijs’s (2003) contention that teacher leaders are developers and modelers of effective forms of teaching, all lead to one consistent conclusion that teacher leaders described above and their exemplary classroom instructions displayed their transformational leadership characteristics in the classroom, subsequently, giving rise to excellent classroom performance.

In the above context, it is reasonable to say that the examination of teacher leaders’ classroom behaviors using transformational leadership as a frame of reference could go some way to explaining why excellent teachers tend to become teacher leaders (Snell & Swanson, 2000) and conversely, why teacher leaders are generally excellent teachers. Pounder (2006) posited that, it is possible that these individuals possess transformational leadership qualities that result in them being effective performers in both teaching and leadership.

Transformational classroom leadership is therefore inexorably linked to teacher leadership whereby teachers who display leadership in the classroom initiate unlimited
transformative potential in their students and colleagues, in the way that affects both these

groups” beliefs, motivation learning levels, and teaching outcomes.

Related Research on Transformational Leadership and its Impacts

For more than two decades, related studies have been carried out on the effects of
leadership styles in classrooms. In 1994, Cheng conducted a detailed study on 678 classrooms
in 190 primary schools in Hong Kong. His classroom leadership study focused on task versus
maintenance conceptualization. He worked on the notion that a classroom is similar to a social
organization with teacher as the leader and students, followers. Cheng’s overall findings
showed that leadership style in the classroom has strong effect on classroom social climate, a
notion proffered by Moos and Tricket (1974) comprising involvement, affiliation, teacher
support, task orientation, competition, order and organization, rule clarity, teacher control and
innovation. Likewise, the leadership style portrayed in the classroom also positively led to high
affective performance of student in variables such as self-concept, attitude to peers, attitude to
school, attitude to teacher and self-efficacy of learning.

In another interesting study, in the context of science education in Australian schools,
two researchers, Rickards and Fisher (1996) examined the effect of students” perceptions of the
teacher’s interpersonal behavior on student achievement and attitude in class. The leadership
dimensions examined were the teachers” abilities in conveying enthusiasm for the subject
matter, confidence, holding attention, and to know what is happening in class. The researchers”
findings pointed to a significant and positive correlation between teacher leadership style on
students” achievement and attitude. Other interpersonal dispositions that showed favorable
correlations are helpfulness, friendliness, and understanding of teachers towards students.
Likewise, pertinent findings from Wubbels, Brekelmans, and Hoomayers’ (1991) study on 50,000 students also reasserted that students rate the best and strong classroom teachers are those who are friendly and understanding. In the UK, similar teacher effectiveness studies from the Hay McBer Report (2000) underlined three factors that scored high with students; teaching skills, professional characteristics and classroom climate had significant influence of student progress. Particular attention must be paid to the professional characteristics variable that students highlighted. These include teachers’ leadership behaviors such as the ability to challenge and support, self-confidence, consistency and fairness, respect for others, setting targets that stretch the students’ performance as well as holding them accountable for their performance. The findings from Hay McBer Report certainly underscored the fact that teacher leaders that perform well in classrooms positively impact the classroom climate, subsequently, affecting their students’ academic progress. Despite coming short on the amount of research done on teacher classroom leadership, evidence does show that effective classroom leadership can have a significant influence on student attitude in class and their achievement.

The research findings above reaffirmed that the outcomes of teacher transformational classroom leadership is equal to the positive impacts organizations benefit from having transformational leaders. They both lead to the high influence on subordinates’ efforts and satisfaction (Bass & Avolio, 1990; Bycio, Hackett, & Allen, 1995; Howell & Frost, 1989; Kirkpatrick & Locke, 1996; Parry, 2000). This positive correlation has been observed in many contexts as cited by Pounder (2006) in Gellis (2001); Hoover (1991); Podsakoff, Mackenzie, Moorman, & Feller (1990); and Yammarino and Bass (1990). Pounder went on to say that a tentative hypothesis can therefore be formed that teacher leaders employ transformational leadership qualities in the classroom that lead to the perception that they are exemplary
teachers. The literature thus far shows that there is an affinity between transformational leadership displayed in classroom and exemplary classroom performance.

Part 2: Gifted Education

The second part of this literature review will investigate the term “gifted” since the aim of this research is to determine teacher leadership in gifted education. Various studies have indicated that teacher plays a pivotal role in student learning (Good & Brophy, 2003). Eggen & Kauchak (2006) asserted this belief when they stated matter-of-factly that, the teacher is the most essential educational determinant of student learning and development. Scholarly likes such as the researcher above, and Shulman (1986) also identified the four domains of knowledge that are deemed of paramount importance for teachers to possess:

(a) content or subject matter knowledge for teaching,

(b) pedagogical content knowledge or the understanding of specific subject matter knowledge for teaching,

(c) general pedagogical knowledge, an overall understanding of instructional principles,

(d) knowledge of learning and the learners which refers to the teachers capabilities to adapt instruction based on the learners individual differences.

The listed knowledge domains above would assist teachers to make professional decisions regarding both curriculum (content to be taught) and instruction (how such curriculum is to be taught) (Eggen & Kauchak 2006; Rogers, 2002). In similar vein, Kaplan in
Rizza & Gentry’s (2001) interview, reasserted that teachers must have the „ability to distinguish the nuances of terms and their corresponding implications for practice, which is curriculum (what) vs. instruction (how), potential vs. intelligence, and program vs. service” (p.175).

The scope of the rest of the discussion on gifted education will begin with a brief historical perspective on how gifted or giftedness evolved overtime.

**Historical Perspective**

Gifted education refers to special services, practices, theories, procedures, and policies used in providing for the unique needs of gifted students (Purcell & Eckert, 2006). Gifted education was brought into the limelight as early in the late 1880s. However, the concern for this special education was not as great as most gifted students then were attending schools not only based on their academic achievement but the ability to afford the school fees (Newland, 1976).

In spite of gifted education being sparse, there were a few outstanding schools in America that pioneered the launch of some interesting programs for the gifted. Interestingly, some of these programs are still alive and still being implemented for the gifted in the 21st century, though may have undergone some refinement. Some of the pioneering gifted programs were „tracking” which was implemented in 1870 at St Louis, which allowed gifted students to accelerate their learning pace. In 1884, in Massachusetts, saw the launch of a „double tillage” plan whereby bright students were allowed to skip grades. Two years later, schools in New Jersey initiated a „multiple-tracking” system that allowed gifted students to progress at a faster pace. In 1891, schools in Massachusetts introduced another program that
enabled students capable of more high-accelerated work to study with special tutors, under the “double-track” plan. Then around 1900, gifted students were allowed to compact their three years of education into two. By 1920, more schools have created more programs for the gifted students. However, in between 1920s-1930s, the interest in the provision of gifted education waned, and this was largely due to the sentiments of the era where “equity” was the main focus, which simply meant that everyone should be given the same kind of quality education.

This was in contrast with Europe, where not much attention was placed on the gifted. This was perhaps due to the schooling system in Europe where the system is geared towards providing education to those that were intellectually able. It was only in the 1990s that gifted education gained some momentum and the necessary attention in England (Gross, 2003)

Related Research on Gifted

In 1905, Alfred Binet and Theodore Simon brought the notion of gifted and giftedness to the forefront. Both these gentlemen were commissioned in Paris to devise an instrument that would differentiate children’s mental intellectual level by age. While the test of general intelligence would be used to correctly place children into their appropriate settings, their instrument later became useful in assessing the intelligence of gifted children (Tannenbaum, 1983).

In 1916, one of the most noted researchers in gifted education, Lewis Terman, a psychologist from Stanford University modified the Binet test, and used it to conduct a major longitudinal study of 1,500 gifted students which continued until the late 1950s. His study on these gifted students has been recognized as the most studied group of individuals in the world (Purcell & Eckert, 2006). Terman’s goal was to alter adults’ attitudes toward intelligent
children and promote educational programs for the gifted (Jolley, 2005). His findings was the climax of the gifted movement as not only did his findings point to a list of gifted characteristics, but they also dispelled myths that were associated with being gifted; as being weak, unpopular, disturbed, neurotic, and having abilities that are one-sided.

Some of the notable findings from Terman’s studies on high IQ children were that students that were allowed to accelerate based on their intellectual potential were more successful than those that were not permitted to. In fact some of the consequences of those in the group where they were not permitted to accelerate experienced poor work habits and wrecked careers. His studies also found a correlation between gifted students and their parent education. Those that were labeled „productive” came from families where 50 percent of their parents were college graduates and the „least productive” group had 15 percent of their parents with college degrees.

Other scholars that contributed to the study of mental measurement include Thorndike, Pearson, Yerkes, and Hollingworth. Another notable pioneer in the field of gifted education as Purcell and Eckert (2006) stated, was Leta Hollingworth, who studied about gifted students for over two decades. Hollingworth was the first to recognize the effect schools had on gifted students and their social and emotional needs. She found that gifted students should be grouped homogenously. Moreover, Hollingworth was also remembered for her association with the term „asynchronous development”, which Purcell and Eckert (2006) assert is possessed by gifted students, who may be more complex and intense than their peers of the same-age. „Asynchronous development” also explains why gifted students demonstrate different maturity levels in different situations, which could lead in problems such as adjusting socially and mentally.
Today, all over the world, advocates of gifted education are echoing the views that have been held by the early pioneers in the field. Gifted students have special learning needs for which curriculum and instruction should be adapted (VanTassel-Baska, 2000; Gallagher & Gallagher, 1994). In an interview conducted by Rizza and Gentry (2001), six scholarly authorities in the field of gifted education, Gallagher, Kaplan, Reiss, Renzulli, Tomlinson, and VanTassel-Baska, were asked specifically about the “core non-negotiables” that teachers ought to have on knowledge and skills of the gifted and talented. Four areas emerged and the following are what the six experts shared consensus on:

1) That good teaching doesn’t necessary mean that it is enough for gifted students, rather teachers should raise the bar for all learners.

2) That teachers should understand the often imbalanced, diverse and individualistic needs of gifted learners. They agree that such teachers need to be aware and understand the different services and methods available to meet these students’ needs. More importantly, the scholars stress that without the background in the existing methods and materials, it is unlikely that implementation will occur and recommend that teachers’ preparation programs and graduate studies take into account the teaching of these methods.

3) That teachers be aware that the information processing facilities of these gifted students are different, teachers must have the ability to
   a. differentiate curriculum to challenge students. VanTassel-Baska, in Rizza and Gentry (2001), emphasized that teacher directed differentiation for the
gifted has no meaning if teachers cannot perform these types of tasks and evidence these skills;

b. assess their students’ performance in sophisticated ways thereby encouraging students to strive for excellence;

c. access and use advanced content which means provide a learning environment that accommodates different learning abilities and ideas. Gallagher in his response (Rizza & Gentry, 2001), said that „teachers should be comfortable using a repertoire of strategies, to motivate and encourage students to think. The scholarly six argues that the scope of the curriculum needs to move beyond low level processing and into more advanced areas of knowledge and skills.

4) Lastly, for teachers be the ideal model for their students. This means teachers must be passionate about teaching and the area of their expertise. They must themselves be lifelong learners if the same degree of enthusiasm is to be conveyed to their students.

At the present education time, teachers must be prepared to carry out educational innovations to enhance learning. Darling-Hammond (1997) postulated that progressive methods of education like those advocated by Dewey (1938, 1964) include rigorous content, project work, independent thinking, self-management and creativity, which were later utilized by Leta Hollingworth in her teaching for the gifted, required „extensive skill … to teach both subjects and students well” (p.12). When teachers are not adequately equipped with knowledge and skills, complex teaching methods do not survive. Pedagogy excellence can only be attainable if
it includes curriculum differentiation, higher-order thinking, and inquiry-based teaching as outlined in reforms, and that requires teachers’ understanding of intellectual conceptual knowledge and skills appropriate for gifted learners.

For the last decade or so, research has also clearly indicated that quality teachers matter to student achievement. Darling-Hammond, 2002; Hess, 2001; Walsh, 2001 asserted that though there have been many papers written at policy level on what constitute qualities of effective teachers and how one can be effective, the assertions however is based on a database that is thin and inconsistent. This is partly due to the difficulties in studying the issues associated with teacher quality. Despite these limitations, there is still sufficient evidence to draw out some conclusions of the characteristics of quality teachers in special education.

Some of the notable characteristics of quality teachers in special education from research findings are appended below:

- Teachers that employ direct and active instructional techniques that engage students. This teaching method has shown high incidences were students’ achievement level increased (Leinhart, Zigmond, & Cooley, 1981).

- Teachers with subject matter knowledge and high verbal ability secure the greatest student achievement gains (Goe, 2007; Rice 2003; Wayne & Youngs, 2003).

- Teachers that graduated from more prestigious institutions were more successful in increasing student achievement scores than those that attended less prestigious institutions (Rice, 2003; Wayne & Yong, 2003).

- Teachers with more experience had a higher effect on student achievement (Clotfelter, Ladd & Vigdor, 2006; Croninger, Rice, Rathbun, & Nishio, 2007; Hanushek, Kain, O’Brien, & Rivkin, 2005; Murnane & Philips, 1981; Rowan, Correnti, & Miller, 2002).
This findings was however inconsistent as some researchers have found that the relationship between experience and student achievement varied by subject. Villar, Strong, & Fletcher (2007) found that the relationship between experience and student achievement was closely correlated in math than reading.

- Teachers with degrees in subject matters such as science and mathematics had a large positive effect on students learning. These teachers hold degrees in mathematics, and have taken coursework in the area of mathematics and are certified to teach mathematics (Goe, 2007; Rowan, Chiang, & Miller, 1997; Goldhaber & Brewer, 2000; Wayne & Young, 2003). Similar findings were found for teachers that graduated with science degrees, though the achievement gains were not as large as math.

- Teachers’ instructional behaviors also correlated with student achievement gains. Teachers that use supportive feedback rather than negative criticism, use class time efficiently, use less independent seatwork, use more large and small group instructions, and consistently monitoring students’ progress are more successful with the effects on student learning (Anderson, Evertson, & Brophy, 1979; Brophy & Evertson, 1976; Brophy & Good, 1986; Medley, 1978; Rosenshine, 1986; Stallings, 1974)

- Reading teachers that promote active, engaging lessons, give student opportunities to practice and engage students’ higher order thinking skills (Cirino, Pollard-Durodola, Foorman, Carlson, & Francis, 2007; Seo, Brownell, Bishop, & Dingle, in press; Taylor, Pearson, Clark, & Walpole, 2000)

- Teachers knowledge in three types of knowledge: subject matter knowledge (content knowledge) pedagogical knowledge (knowledge of instructional strategies), and pedagogical content knowledge (knowing how to represent content for students so that
they can understand) (Shulman, 1986). Other researchers also found from their studies that effective teachers need more than subject matter knowledge. Understanding how to breakdown complex concepts and relate to students in meaningful ways reaffirmed that subject matter knowledge alone is insufficient as an effective teacher (Ball, Lubienski, & Mewborn, 2001; Grossman, 1990; Kennedy, 1991; Rowan et al., 1997; So, 1997; Wilson & Wineburg, 1988)

**Gifted Education in Thailand – A Case of Mahidol Wittayanusorn School**

In Thailand, the term gifted is relatively young. It started to take root slightly more than two decades ago as it was only in 1984 that the terminology „gifted and talented students” was first used in the Thai education system. A Project on Development and Promotion of Gifted Students in Science and Technology (Por-Sor-Wor-Tor) under the supervision of the Institute for Promotion of Science and Technology (IPST) was launched as the country realized the importance of having high caliber scientific personnel to drive the country’s socio-economic development. However, no national or coherent policy existed to support the program resulting in weak and inadequate linkages between various governmental agencies and supporting activities.

It was only in the 1990 that a school system for the gifted was set-up and Mahidol Wittayanusorn School (MWITS), Nakhon Pathom became the country’s first national science school for the gifted. A decade later, the school was transformed into a public organization, making it an independent agency reporting directly to the Ministry of Education (see Figure 3).
Figure 3. Organization of the Ministry of Education at Central Level

Being an independent agency, this also means that MWITS is governed by an independent school board, which has autonomous power in the management, human resources and curriculum design of the school. Currently, MWITS is the only full-fledged school for the gifted with a total student population of 720 annually.

There are also other major general education schools in Thailand that run gifted programs at both lower and upper secondary levels (equivalent to Grade 7-12). However, these
schools are under the supervision of the Office of Basic Education (OBEC) which means their gifted programs do not share the same stringent admission criteria as Mahidol Wittayanusorn School. The admission policy at MWITS is based on a two phase-criterion:

1<sup>st</sup> phase (only the top 500 will be selected)
- A standardized examination that tests on students’ scholastic achievements in Science and Mathematics.

2<sup>nd</sup> phase: (only the top 240 will be selected)
- Scholastic Aptitude Test
- Complex problem solving test on mathematics and science.

The curriculum at MWITS is also differentiated from the other gifted classrooms in general education schools. The curriculum at MWITS is designed by a team of leading scientists and professors from the country’s top universities, with a review conducted in an interim of every three years. Students in MWITS have to undergo similar study of the eight core subjects as stipulated in the national curriculum, as those students in the general education schools, however, further enrichment programs have been arranged for the learning needs of these gifted students in the field of mathematics and science. There are also acceleration programs of AP, where students can sign-up for AP courses in Physics and Mathematics. AP courses’ level of difficulty is equivalent to a university’s first year subject. Table 1 illustrates the curriculum differentiation between the general education schools and a gifted school such as MWITS.
Table 1: Summary of Curriculum between a General Education School and a Gifted Education School

<table>
<thead>
<tr>
<th></th>
<th>General Education Schools</th>
<th>Mahidol Wittayanusorn School</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subjects Completion</strong></td>
<td>3 years</td>
<td>1.5 years</td>
</tr>
<tr>
<td><strong>Extra Academic Courses</strong></td>
<td>-</td>
<td>- Compulsory electives of specialized courses in science, math and technology-related subjects. (39 credits)</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>- Electives (7 credits) which has students choosing courses available in all subject areas or Advanced Placement (AP) in Mathematics and Science and including one more foreign language besides English.</td>
</tr>
</tbody>
</table>
**Table 1: Summary of Curriculum between a General Education School and a Gifted Education School (continued)**

<table>
<thead>
<tr>
<th>Enrichments</th>
<th>General Education Schools</th>
<th>Mahidol Wittayanusorn School</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Science Project, Field Trips</td>
<td></td>
<td>- Science Project, Field Trips</td>
</tr>
<tr>
<td>- Student exchange programs to similar gifted-profiled schools abroad.</td>
<td></td>
<td>- Student exchange programs to</td>
</tr>
<tr>
<td>- Competitions, both local and overseas</td>
<td></td>
<td>similar gifted-profiled schools</td>
</tr>
<tr>
<td>- International presentations at science, math and technology-related fairs.</td>
<td></td>
<td>abroad.</td>
</tr>
<tr>
<td>- Lab participation at CERN in Switzerland and X-Lab, Germany.</td>
<td></td>
<td>- Lab participation at CERN in</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Learner Development Activities</th>
<th>General Education Schools</th>
<th>Mahidol Wittayanusorn School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counseling, Community Services, Club activities.</td>
<td></td>
<td>Counseling, Community Services,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leadership Activities, Special</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lectures, Academic camps,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>reading list, club activities</td>
</tr>
</tbody>
</table>

The two widely known approaches of curriculum that provide the basic framework for teaching gifted and talented are acceleration and enrichment (Taylor, Smiley & Richards, 2009). According to the authors, “acceleration involves moving the student through the curriculum at a faster pace, while enrichment involves modifying or adding to the curriculum to make it richer and more varied, such as additional research projects in specific areas related to students’ interests. Besides that, enrichment includes different program delivery services such as field trips, competitions, and summer programs. In some schools, a combination of both approaches is applied.” (p. 529)
At MWITS, the enriching approach to curriculum is largely adhered, whereby students, besides undergoing the mandatory learning of core subject areas, as stipulated in the Basic Education Core Curriculum Handbook, in a compact approach; are also given choices to undertake an accelerated approach in some AP subjects such as Physics and Mathematics. Besides that, all other gifted students at MWITS undertake compulsory electives in specialized courses in science, math, and technology-related subjects that emphasize higher-thinking skills or specific areas in which students have superior talent in.

**Characteristics of Gifted Students**

Many literature of gifted education has postulated the importance of teachers having knowledge about the characteristics of giftedness and gifted students. This is because their knowledge would influence their actions and practices in the classroom (Schroth & Helfer, 2008). It should also be noted that gifted students display several gifted characteristics, hence are a heterogeneous group with multi-range skills. Despite several definitions of the meaning of giftedness have emerged from literature, one that is most frequently used (Allen, 2005) was coined in 1993, when the U.S. federal report National Excellence characterized gifted children as individuals possessing high performance capability in areas such as intellectual, creative, artistic, or leadership capacity, in specific academic fields, and require services or activities to fully develop their capabilities, which are not regularly provided by the school.

Winebrenner (2001) delineated five foundational characteristics of gifted students as follows:

(i) acquire new material faster and earlier than their peers of the same age; their acquired information is retained for a lifetime with no review necessary;
(ii) deal with complex concepts and abstract ideas better than children of their age;

(iii) spend a long duration of time in learning about one or more topics when they are highly interested in them; and are good multi-taskers.

(iv) are driven by individualized instruction and they do not necessary need to follow the prescribed curriculum (Powers, 2004).

(v) possess advanced cognitive qualities in thoughts and language, and are logical thinkers. Also, they are motivationally inspired; eager, curious and persistent in their learning (Davis & Rimm, 2004).

So, how do teachers teach these students? What constitute the best practices for this heterogeneous group of students? Bain, Bourgeois, and Pappas, (2003) suggested that schools should consider a curriculum than focuses on concepts and generalizations versus specifics, while more recent literature tended to focus on the application of technology as beneficial for the gifted (Besnoy, 2007; Shaunessy, 2007; Siegle, 2005). Still, there are many experts calling for the promotion of differentiated instructional program to best meet the learning needs of these diverse intellects Davis & Rimm (2004), and Little, Feng, VanTassel-Baska, Rogers & Avery (2007) stated that a beneficial curriculum for the gifted is one that promotes critical thinking and problem-solving experiences, and Hmelo-Silver (2004) and Leonard (2002) mentioned two theories of learning that support classroom differentiation; Bloom’s Taxonomy of the cognitive domain model and problem-based learning, which will be the central focus of this research.
Bloom’s Taxonomy of the Cognitive Domain

One of the foremost questions faced by educators is how do students learn. The answer to this question was provided by one renowned scholar, Benjamin Bloom, whose extensive study on the varied domains of human learning, and his personal desire to improve student learning, resulted in the 1956 Bloom’s taxonomy of the cognitive domain. This model has withstood almost six decades of time, and remains actively applied and cited as reference in the education circle as it provides a systematic classification of processes of thinking and learning.

Bloom’s original taxonomy embraces three domains: (1) cognitive (knowledge-based), (2) affective (attitude-based) and (3) psychomotor (physical skills-based). In laymen terms as Owen (2006) coined were (1) knowing, head; (2) feeling, heart; and (3) doing, hand/body. In 2001, a minor revision was carried out in meeting with the 21st century changes in society, where the authors; one of his former students, Lorin Anderson worked in collaboration with one of Bloom’s original partners, David Krathwohl to come out with a concise summary of Bloom’s original taxonomy; a model they stressed was an extension of Bloom’s original framework. This revised model saw changes in terminology, structure and emphasis, and serves as a more powerful tool to fit the needs of today’s teachers.

For this study, concentration of the discussion will be on Bloom’s cognitive domain of human learning as it relates to the curriculum planning of teachers and the teaching applications in the classroom, ultimately, in achieving pedagogical excellence.

Bloom Taxonomy is a multi-tiered principle of classifying thinking according to six cognitive levels of complexity. An analogy similar to a staircase, learning is a progressive pattern and teachers encourage students to climb higher to a new level of thought as illustrated in the diagram below. This means that the hierarchical framework requires achievement of a
prior skill or ability before the learner progress to the next, complex level. The three lowest levels of thinking are knowledge, comprehension, and application (often referred as knowledge and comprehension skills) while the highest levels of thinking are analysis, synthesis, and evaluation (also referred to critical thinking skills). A little note is that the revised taxonomy by Anderson and Krathwohl (2001) (see Figure 4) changed the original nouns to verbs; changed the top structural level of the original - Evaluating to Creating in the new version, while Synthesis on the second top of the original moved to the top most under the new version, and termed under a new name Creating.

**Figure 4: Revised Version of Bloom’s Taxonomy**

![Image of Bloom's Taxonomy](http://www.unco.edu/cetl/sir/stating_outcome/documents/Krathwohl.pdf)

Under the new revised taxonomy of Anderson and Krathwohl (2001), the terms are defined as follows:

- **Remembering**: Retrieving, recognizing, and recalling relevant knowledge from long-term memory.
• Understanding: Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.

• Applying: Carrying out or using a procedure through executing, or implementing.

• Analyzing: Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.

• Evaluating: Making judgments based on criteria and standards through checking and critiquing.

• Creating: Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.

Bloom’s Taxonomy has positive implications to both gifted and general education as a classroom environment designed around the taxonomy model provides educators with a framework for designing a curriculum that supports higher levels of thinking (Davis & Rimm, 2004; VanTassel-Baska, 2003). Dixon et al. (2004) noted that when teachers motivate gifted students to develop critical thinking skills, they become “more effective learners who value what they do” (p. 57). Therefore, teachers who are proficient in providing challenging learning environment will likely view the use of high level learning activities as an essential component of the curriculum (Croft, 2003). These teachers are likely to introduce teaching methods that embodies the incorporation of the six classifications of thinking consistently in their classroom.
Wormeli (2005) stressed that the use of the systematic processes of thinking assists students to interact with, as well as summarize, what they have learned.

One other significant change that resulted under the Revised Bloom Taxonomy that warrants a discussion was the introduction of a two-dimensional perspective to learning as opposed to the original one-dimensional form. The breakdown of the four types of knowledge dimension will assist teachers of the gifted with a tool in designing effective curriculum. The two-dimensional principle, also called the “Taxonomy Table” is significant and logical when examined closely as it shows the intersection of The Knowledge Dimension (the kind of knowledge to be learned) and the already familiar, Cognitive Process Dimension (the process one uses to learn).

*Table 2. Bloom’s Taxonomy Table*

<table>
<thead>
<tr>
<th>The Knowledge Dimension</th>
<th>The Cognitive Process Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Low Order Thinking</strong></td>
</tr>
<tr>
<td></td>
<td>Remember</td>
</tr>
<tr>
<td>Factual Knowledge</td>
<td><strong>List</strong></td>
</tr>
<tr>
<td>Conceptual Knowledge</td>
<td><strong>Describe</strong></td>
</tr>
<tr>
<td>Procedural Knowledge</td>
<td><strong>Tabulate</strong></td>
</tr>
<tr>
<td>Meta-Cognitive Knowledge</td>
<td><strong>Appropriate use</strong></td>
</tr>
</tbody>
</table>

Delisle (2006) rated Bloom’s model as an authentic tool for instructional delivery, planning and assessment. The researcher mentioned that teachers will get a clear-cut roadmap in writing their teaching objectives. In addition to writing teaching objectives, he claimed that the model also allows for the use of questions and independent assignments that promotes and
elicits higher level thinking. Little et al. (2007) study on 1,200 high-ability elementary and middle school students revealed that a curriculum that focused on stimulating higher level thinking activities yielded big gains in content than a curriculum that focused on a knowledge-based structure. Also, Coleman (2003) pointed to Bloom’s model as essential in developing creativity among gifted students through the use of questioning techniques. Teachers need to engage gifted students in divergent thinking questions that seek open-ended responses. These divergent questioning techniques comprise questions that are interpretative and reflective in nature, and allow room for comparison and analysis. Coleman further purported that when teachers engage gifted students in divergent questions, they create an environment that “promotes active engagement, student exploration, and student inquiry to further student achievement” (p. 1). This was later supported by a group of researchers who found that by asking questions, teachers are activating and developing students’ conceptual understanding of the lessons (Patrick, Bangel, Jeon & Townsend, 2005).

According to the US Georgia Department of Education, (2004), gifted learners’ learning interest is high when teachers encourage students to think critically by looking at causes, experiences, and facts in order to reach conclusions. Croft (2003) summed it well when he posited that higher order thinking is far-fetching, more than information retrieval. Higher order thinking, in its simplest form, entails the transformation of ideas and information. The transformation occurs when students work to combine facts and ideas. After generalizing, synthesizing, and hypothesizing about facts and ideas, they will reach to some conclusion or interpretation. VanTassel-Baska (2003) emphasized that these students, when are exposed to this routinely, will then automatically make the habit of thinking critically a part of their thinking process.
Therefore, the understanding and implementation of Bloom’s Taxonomy of the Cognitive Domain by all teachers will surely reap many benefits in today’s teaching and learning practices, not only the gifted but all students in general. Bloom’s taxonomy model embodies a number of principles for a differentiated curriculum for gifted education, and it stimulates student thinking through teacher strategies in various subject areas (Leonard, 2002).

**Problem-based Learning (PBL)**

Problem-based learning (PBL) originated in 1920 when a primary school teacher, Celestin Freinet, a primary school teacher came back injured from World War 1. Since he was incapable of teaching for a long time, he conjured a new methodology that would allow him to teach in a satisfactory manner. In 1960, the modern history of PBL started to take form and the Mc Master Medical School in Hamilton, was the first to implement a PBL-based curriculum in 1969. Today, PBL is widely spread in schools and higher education, while in medical schools, the PBL approach is largely used in the pre-clinical curriculum.

The mainstays of the PBL approach are communication skills, cooperative learning, self-responsibility, and self-evaluation of students” learning process. Grappling with questions is the essence of problem-based learning (PBL). According to experts in the field of PBL such as the likes of Kilpatrick (1918, 1921) and Dewey (1938), problem-based learning approaches advocate for the importance of practical experience in learning, and promote meaningful and experiential learning. This theory of learning or PBL immerses students in real-world, complex situations in their learning of the curriculum whereby open ended problems are posed to challenge students to think of the many ways of solving a problem. Gallagher and Stepien (1996) stated that in searching for solution to problems, students simultaneously learn content
and improve their skills in research, high-order thinking, decision making and more. They stressed that PBL is particularly useful in secondary gifted education.

PBL has provided viable answers to school reform issues centered on gifted education (Evans, 2008). Teachers who follow the PBL theory should be aware of some of the common characteristics of this theory despite the numerous ways one can implement it (Swicord, 2012). One characteristic is that, there is always a direct connection to the curriculum and the curriculum is inherently interdisciplinary. The content focuses on questions or problems that students need to be actively engaged in building knowledge in order to discern the meaning of the curriculum concepts. The other characteristic of PBL is that it advocates for a constructivist classroom environment where students in their collaborative groups feel motivated and are self-directed to a significant degree in their pursuit to finding solutions to the problem, while teacher acts as the facilitator (Hmelo-Silver, 2004). Zimmerman (2002) pointed to the large gains that students receive from PBL learning, whereby he stated that because of the open-ended nature of questions, students get into an experimental learning mode, comprising investigation, explanation, and finally arriving to a meaningful resolution. Similarly, Swicord (2012) addressed that students may redefine the problem as they research the problem, and the process is likely to be longer than traditional task problems.

Research Related to Problem-based Learning

Research on PBL is however still premature in numbers, yet, has shown positive results that hold promise for gifted students as well as students in the general education. Aside from the motivational characteristics of working with authentic problems in the environment that nurtures independence, self-selection of topics, and an emphasis on professional products,
gifted student exhibit qualities often associated with expert problem-solvers, thus making PBL a natural methodology for them. According to Swicord (2012), expert problem-solvers have broad knowledge bases; gifted students acquire information quickly. Experts look for the deep structure of the problem; gifted students demonstrate this kind of conceptual learning at an early age. Experts have many skills in their repertoire and use them flexibly; gifted students learn to carefully select problem-solving strategies as they work through problems. Expert problem-solvers monitor their problem solving processes while gifted students spontaneously use metacognitive skills and show early recognition that many questions have more than one answer. Bottom-line is PBL appeals, and is suited for gifted students because the content is conceptual and their pace is appropriate because it is self-directed.

Research has recorded that students using PBL perform as well on standardized tests and often better than students in non-PBL classrooms. This is because students using PBL learn research skills, understand the subject matter at a deeper level and are engaged in their work. Gibson, Rimmington and Landwehr-Brown (2008) asserted that PBL equips students to be lifelong problem solvers as they get exposed to real situations. Gregory and Chapman (2002) supported the idea as they maintained that the use of problem-based learning do indeed develop these gifted students’ research skills, besides allowing them to retain information, and think abstractly. In a similar vein, Tate’s (2003) observation on PBL theory led to a conclusion that information acquired when students are engaged in problem-based instruction is „long retained” (p. 73). Zimmerman (2002) emphasized that the open-ended problems complement gifted students’ diversity in interest, readiness, learning style and talent. VanTassel-Baska (2003) cautioned educators that PBL theory is an essential principle for teachers to consider when
planning instruction for gifted students. She pointed to the potential loss in learning for these gifted students if PBL activities are not implemented in classrooms.
CHAPTER III

RESEARCH METHODOLOGY

The following chapter addresses the research objectives and research methods utilized for this study. The study saw the necessity of collecting both quantitative and qualitative data to obtain a more assuring research outcome for the phenomena under examination. Moreover, by combining both the quantitative and qualitative data, a potentially high accuracy of the results can be obtained. Best and Kahn (2003) stressed that data obtained from these methods are richer and thus, provides a comprehensive picture. Therefore these methods are considered a continuum, rather than a mutually exclusive dichotomy. In this study, a survey was administered under quantitative data collection, whereas for qualitative data, three varied forms of collection were carried out; content analysis, interviews and document analysis.

The overall design of the study, details concerning the population, sample, research instruments, data collection and analysis are presented below.

Research Objectives

The following research objectives provided the structure of this study.

1. To identify the effective teacher leadership for gifted education.
2. To identify the current teacher leadership practices that exist in gifted education in Thailand.
3. To develop an effective teacher leadership framework for gifted education in Thailand.
Research Objective One. To identify the effective teacher leadership for gifted education.

A content analysis was used to explore research objective one. This was done by employing the tree-like dendrogram diagram of clustering recurring themes that appeared from extensive readings of books, journals and publications (Appendix B) on the subjects central to this study - teacher leadership and gifted education. A validation was then sought from experts on the nine predictive constructs identified as effective teacher leadership practices.

After validation, a research instrument was then developed encompassing the three major areas that emerged and their corresponding constructs that were identified from the content analysis. A total of nine constructs were yielded from the analysis, and carefully thought out questions were drawn-up. A 5-point Likert scale was used for the respondents to express their degree of agreement to the questions. One of the important advantages of this universally-used scale is that it does not force respondents to take a particular stand, but to indicate only their degree of agreement. Furthermore, the responses are easily quantifiable through mathematical analysis.

The three major areas identified were school leadership, teacher leadership, and principles of learning, while the nine corresponding constructs under these three areas were: i) school leadership and climate ii) distributed leadership; iii) relationship and influence, iv) collaboration, v) professional learning community, vi) professional development, vii) transformational leadership; viii) Bloom”s Taxonomy and ix) Problem-based learning.
Validity

In order to ensure the validity of the instruments and overall quality of the research, findings obtained from research objective one underwent a validation process, whereby experts from gifted education were consulted on the three major areas identified along with the nine constructs that are believed to lead to effective teacher leadership. Once validated, an instrument was designed: Teacher Leadership for Gifted Education Survey. The items in this survey was then validated by five experts using the Item Objective Congruence Form (see Appendix C), whereby the experts were selectively chosen from the field of gifted education. Validation process was initiated from December 10 to January 20, 2013. Comments from the experts were then taken into consideration and some changes were made to accurately reflect the item objectivity it hoped to measure.

Experts selection.

The selection of experts was crucial to the research due to the operational word “gifted” as teacher leadership alone in general education does not necessarily translate to effective teacher leadership in a gifted environment due to the unique ways gifted students learn. Moreover, research conducted on gifted education has revealed that the educational innovations resulted from these research have been instrumental in the reform efforts of general education (Rizza & Gentry, 2001; Pfeiffer, 2003). Therefore, invited experts should ideally possess knowledge in leadership and has experience either with the administering or teaching of gifted programs and dealing with gifted students. The researcher therefore lined-up five leading experts with strong direct experience in educational leadership in gifted education. These experts were invited to reflect on the three major areas identified from the content analysis.
School leaders were represented by one former school director for the gifted, and the other a former assistant principal of a gifted school. Representing the second major area – teacher leaders; two former teachers were invited as experts. The last expert represented the field of educational psychology and is a specialist in gifted and teacher education. (Appendix D)

The survey in Appendix E reflects the final changes that were made to the constructs based on comments made by these five experts.

**Research Objective Two.** To identify the current teacher leadership practices that exist for gifted education in Thailand.

In addressing research objective two, both quantitative and qualitative data were collected. The explanatory mixed method design, the most popular strategy used in educational research was employed here, where data collection were launched sequentially in three varied manner – survey, interview and document analysis. Creswell (1994) purported that the explanatory mixed method design, also referred as a two-phase model consists of collecting the quantitative data first, and then using the qualitative data obtained to help provide more analysis, refinement, as well as extension to the general picture of the research problem obtained earlier from the quantitative data.

The validated survey was then launched first with teachers, and the findings from the survey were used to inform the next method of data collection, the interview. In this study, the findings from the survey were used to design the probing/clarification questions for the interview. Last in sequence was the document analysis which main purpose was to verify the use and application of the principles of learning in classrooms. The discussions that follow suit will be broken down into three parts: Part 1: Survey, Part 2: Interview and Part 3: Document.
Part 1: Survey of teacher leadership for gifted education.

The nine constructs and their corresponding items to effective teacher leadership for gifted education are appended below in Table 3.

Table 3. Survey Structure

<table>
<thead>
<tr>
<th>Construct</th>
<th>Questions</th>
<th>Item</th>
</tr>
</thead>
</table>
| 1         | **School leadership and climate** is the type of leadership displayed by the school administrators or principals who lead and manage the school.  
1) The school goals are defined and communicated to me.  
2) The curriculum goals are achievable by my students.  
3) The administrators encourage teachers to be leaders in the school. | 1-3  |
| 2         | **Distributed leadership** is operationally defined as leaders who involve the participation of multiple people, and take effort in guiding and mobilizing others to bring about effective changes in and beyond the classroom.  
4) The administrators and teachers work positively as a team and share good partnership.  
5) The administrators involve teachers in decision-making concerning school improvement, student learning, curriculum planning etc.  
6) The administrators and teachers share open communication where teachers are able to freely discuss their opinions and concerns towards school improvement and student learning.  
7) I am satisfied with the teaching and learning environment that exists in the school. | 4-6  |
Table 3. Survey Structure (continued)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Questions</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td><strong>Relationship and Influence</strong></td>
<td>8-14</td>
</tr>
<tr>
<td>8)</td>
<td>I find time to exchange ideas and reflect with my colleagues on our teaching practices.</td>
<td></td>
</tr>
<tr>
<td>9)</td>
<td>I consider myself persuasive and can positively influence my colleagues to implement good teaching methods.</td>
<td></td>
</tr>
<tr>
<td>10)</td>
<td>I listen attentively to my colleagues when they talk about their teaching experiences.</td>
<td></td>
</tr>
<tr>
<td>11)</td>
<td>I give advice to my colleagues when I feel an idea is not appropriate.</td>
<td></td>
</tr>
<tr>
<td>12)</td>
<td>I try to initiate ideas or new methods with my colleagues to improve our teaching.</td>
<td></td>
</tr>
<tr>
<td>13)</td>
<td>I am happy assisting my colleagues in non-teaching related issues.</td>
<td></td>
</tr>
<tr>
<td>14)</td>
<td>I respect and understand the different values and beliefs of my colleagues.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td><strong>Collaboration</strong></td>
<td>15-20</td>
</tr>
<tr>
<td>15)</td>
<td>I share teaching materials and teaching strategies with my colleagues.</td>
<td></td>
</tr>
<tr>
<td>16)</td>
<td>I can seek help whenever the need arises for good and creative teaching ideas from my colleagues.</td>
<td></td>
</tr>
<tr>
<td>17)</td>
<td>I am comfortable having my class observed anytime by my colleagues.</td>
<td></td>
</tr>
<tr>
<td>18)</td>
<td>I welcome constructive feedback and help from my colleagues.</td>
<td></td>
</tr>
<tr>
<td>19)</td>
<td>There is a climate of trust and respect for each other among colleagues.</td>
<td></td>
</tr>
<tr>
<td>20)</td>
<td>There is strong collaboration among teachers in my department with teachers in other.</td>
<td></td>
</tr>
</tbody>
</table>
**Table 3. Survey Structure (continued)**

<table>
<thead>
<tr>
<th>Construct</th>
<th>Questions</th>
<th>Item</th>
</tr>
</thead>
</table>
| 5 Professional Learning Community | 21) Teachers in the school share good relationship with each other personally and professionally.  
22) Teachers in my school actively engage in discussions regarding improvements in teaching through social network, discussion forums etc.  
23) Teachers in my department have a regular scheduled time to reflect and discuss teaching practices.  
24) Teachers in my department actively share new ideas gained from reading, attending training or workshops with each other.  
25) Teachers in my department discuss and share new instructional techniques and strategies in a formal/informal setting.  
26) Teachers in my department welcome critical feedback and comments from colleagues. | 21-26 |
| 6 Professional Development    | 27) Teachers are supported with regular training sessions on latest instructional practices, attend workshops and conferences.  
28) Teachers are supported with professional resources, materials and technology.  
29) Teachers are allotted and encouraged to dedicate fixed-hours of time towards professional development.  
30) My school frees time for teachers to develop professionally.  
31) My school provides financial program for individual development.  
32) I try to search and read new techniques to improve my professional skills. | 27-32 |
Table 3. Survey Structure (continued)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Questions</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 Transformational Leadership</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>33) I make small conversations with students before and after class to get to know them better as individuals.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>34) I integrate my lessons with issues on morality and ethics.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35) I communicate the learning goals to my students and motivate them towards the goals.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>36) I establish personal relationships with my students (eg. their family background, their aspiration, understanding them as a person).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>37) I avoid disruptions from individual students (eg. students who are not paying attention, unfocused, talking, paying their computer, mobile while teacher is teaching etc.) by talking to them and try to find ways to solve the problem.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>38) I use new instructional approaches and innovative ways in motivating my students to learn.</td>
<td>33-38</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Bloom’s Taxonomy</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>39) I have an understanding of Bloom’s Taxonomy of Learning from my professional /teacher training.</td>
<td>39-44</td>
</tr>
<tr>
<td></td>
<td>40) I am aware of the varying levels of thinking in Bloom and consciously plan my lessons to take my students gradually up the taxonomy levels.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>41) I use the inductive approach more than the deductive approach in my teaching to guide students’ thinking.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>42) My lessons encourage the application of the higher order thinking skills (analyze, evaluate and create).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>43) I use questioning, role-playing, debates, brainstorming, concept maps, peer interaction in my classrooms.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>44) I see assessments as a measure of improving my students’ higher order thinking skills.</td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Survey Structure (continued)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Questions</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>9</strong></td>
<td><em>Problem-based Learning (PBL)</em></td>
<td>45-50</td>
</tr>
<tr>
<td></td>
<td>45) I use effective questioning (eg. triggering, probing, analyzing, re-directing, follow-up etc.) typed of questions in starting my lesson and throughout the course of my lesson.</td>
<td>45-50</td>
</tr>
<tr>
<td></td>
<td>46) I introduce significant real-life issues and authentic problems to my students to solve.</td>
<td>45-50</td>
</tr>
<tr>
<td></td>
<td>47) I do more peer-group in the classroom tasks than allow students to work individually.</td>
<td>45-50</td>
</tr>
<tr>
<td></td>
<td>48) I assign students at least one complex task in one semester to allow for self-directed study in their groups to solve a problem.</td>
<td>45-50</td>
</tr>
<tr>
<td></td>
<td>49) I create new teaching strategies with other teachers.</td>
<td>45-50</td>
</tr>
<tr>
<td></td>
<td>50) I prefer using open-ended questions in assessments to measure my students’ creativity and problem-solving skills.</td>
<td>45-50</td>
</tr>
</tbody>
</table>

Reliability

Two types of reliability measurements were carried out before the survey was administered. The first was on the reliability of the language used in asking the questions, and the second was prior to administering a pilot test.

In order to ensure that language would not pose a problem to the teachers in answering the questions in the survey, the researcher applied the back-translation method, whereby two independent translators from the field of education were asked to translate. One translator translated the original survey to the target language (Thai language), and another translator translated the target language back into the original English version. Some discrepancies in wordings were then mediated by the researcher with the respective translators.
The second reliability measurement in the study was in the test piloting of the survey questions. The survey was tested with a total of 12 teachers; 8 former teachers of Mahidol Wittayanusorn School who were either presently teaching at bilingual, international or government schools, or teachers who have retired from the school for not more than two years. The remaining 4 teachers were teachers teaching gifted classes in their respective schools in Bangkok and Greater metropolitan area.

Cronbach’s Alpha coefficient.

The Cronbach’s Coefficient (α) was applied to determine the reliability of the constructs. Cronbach’s alpha coefficient ranges from 0 to 1, with 0 indicating a poor statistical reliability of the internal consistency of the questions. The closer the Cronbach’s alpha coefficient is to 1, the greater is the internal consistency. As a guideline, the range of Cronbach’s alpha coefficient is as follows: >.9 (excellent), >.8 (good), >.7 acceptable, >.6 (questionable), >.5 (poor), <.5 (unacceptable) (Gliem & Gliem, 2003).

For this study, the overall reliability of the combined nine constructs in the pilot test received an excellent rating, with an alpha coefficient of .938, while independently; each construct scored a good rating, showing an overall steady internal consistency or good average correlation of items in the survey as seen in Table 4.
Table 4. Summary of Cronbach’s Alpha Reliability Ratings for the Nine Constructs

<table>
<thead>
<tr>
<th>Construct</th>
<th>Cronbach’s Alpha Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Leadership and Climate</td>
<td>.72</td>
</tr>
<tr>
<td>Distributed Leadership</td>
<td>.83</td>
</tr>
<tr>
<td>Relationship and Positive Influence</td>
<td>.76</td>
</tr>
<tr>
<td>Collaboration</td>
<td>.72</td>
</tr>
<tr>
<td>Professional Learning Community</td>
<td>.85</td>
</tr>
<tr>
<td>Professional Development</td>
<td>.82</td>
</tr>
<tr>
<td>Transformational Leadership</td>
<td>.77</td>
</tr>
<tr>
<td>Bloom’s Taxonomy</td>
<td>.78</td>
</tr>
<tr>
<td>Problem-Based Learning</td>
<td>.77</td>
</tr>
<tr>
<td><strong>Total nine constructs combined</strong></td>
<td><strong>.94</strong></td>
</tr>
</tbody>
</table>

From the pilot test, three of the constructs (Professional Learning Community, Distributed Leadership and Professional Development) obtained good ratings at .85, .83 and .82 respectively, with the remaining six constructs (Bloom’s Taxonomy, Transformational Leadership, Relationship & Influence, Problem-based Learning, Collaboration and School Leadership & Climate) at acceptable ratings that ranged from .72 to .78.

**Data Collection**

Survey administration was initiated upon receiving consent from the school principal of Mahidol Wittayanusorn School. The quantitative data of the study was collected from January
28 to February 4. This included the start of the survey administration till the collection of the completed surveys. Surveys were personally handed in envelopes to the teachers in school by the researcher, and a drop-box was placed in the researcher’s department of Foreign Language to safeguard the confidentiality of the survey. Out of the total of 83 teachers, 77 surveys were returned with 6 unaccounted for; a return rate of 93%. None of the surveys were damaged or items unscored, but most of the personal information items were left blanked by the teachers.

**Population**

The population for this study was teachers from the first and only national high school for the gifted in Thailand, Mahidol Wittayanusorn School. There are two reasons why the researcher has decided to limit the scope of the study to this particular school.

First, the school was chosen as it is the only school that was set-up by the government in support of gifted education, and is an independent agency reporting to the Minister of Education. MWITS has been established for almost 20 years, hence it can be assumed that the school has a stable environment for the research to be carried out as the curriculum has been drawn up by the country’s leading scientists and experts in alignment with gifted students’ needs.

Second, this school is the only full-fledged provider of gifted education that has the country’s largest gifted student population of 720 annually. There are other gifted science programs in other schools that range from four to six classrooms in 12 Princess Chulabhorn Colleges located in the region, and other gifted designated classrooms that exist in general education schools in Bangkok under OBEC. However, these schools are either at the early stage
of their gifted program or are running a self-administered gifted program for a small number of students.

Since the aim of the study was to investigate teacher leadership in gifted education, the researcher intentionally controlled the environment under study by excluding the other schools with the hope of gaining a more accurate picture of the central phenomena under study. Moreover, students at Mahidol Wittayansuron School have also produced outstanding academic achievements both nationally and internationally. Besides that, the school is seen as the model school for gifted students in the country. The school therefore provided a high-potential, ideal environment for the researcher to conduct her study.

This study employed a purposive sampling for the school under study. There are currently a total of 83 teachers (Thais = 77 and Non-Thais = 6) employed in the school, all either under a full time employment or one-year renewable contract. The researcher attempted to elicit the voluntary participants from all teachers.

**Data Analysis**

In doing data analysis, descriptive statistics such as frequency, percentage, mean and standard deviation were used to analyze the prevailing teacher leadership practices that permeated in the school. Criteria indicating the mean scale interpretation will be applied to guide data interpretation. Table 5 below summarizes the scale interpretation.

In addition, demographic profiles of the teachers were also obtained in most returned surveys. Since the study employed a of mixed-design research methodology, the second form of data collection (interview) was then initiated upon completion of the quantitative analysis.
**Table 5. Criteria of Mean Scale Interpretation**

<table>
<thead>
<tr>
<th>Scale Score</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.51 - 5.00</td>
<td>Very High</td>
</tr>
<tr>
<td>3.51 - 4.50</td>
<td>High</td>
</tr>
<tr>
<td>2.51 – 3.50</td>
<td>Moderate</td>
</tr>
<tr>
<td>1.51 – 2.50</td>
<td>Low</td>
</tr>
<tr>
<td>1.00 – 1.50</td>
<td>Very Low</td>
</tr>
</tbody>
</table>

**Part 2: Interview.**

In exploring research objective 2, which is to identify the prevailing teacher leadership practices at Mahidol Wittayanusorn School, the second form of data collection (interview) in the mixed method design was subsequently launched. One-on-one interviews, according to Creswell (2002), despite being time-consuming and costly, is a popular approach in educational research as it provides an ideal setting for participants who are not hesitant to speak, to articulate their thoughts and share ideas comfortably as they are interviewed individually at a time. Furthermore, through the explanatory mixed method design, interviews will be useful in seeking clarifications or making refinements on some of the key findings obtained from the previous data collection.
Population

The interviewees were selected using purposive sampling. In purposive sampling, researchers intentionally selected individuals and sites to learn or understand the central phenomenon. The important criterion in choosing individuals and sites is to ensure that they are “information rich” (Patton, 1990). The selected individuals were teachers, and the interviews were held in the school’s campus. The selection of the individuals were decided by a group of 20 senior students from Mathayom 6 (Grade 12 equivalent) who were asked to name five top performing teachers from subjects that ranged from the sciences to arts. This particular group of students was selected as they knew the school well after being taught by many teachers in these respective subjects for three years.

Data Collection

The interview questions were carefully designed based on some of the results that emerged from the survey. A total of seven questions were prepared, and the interviews were held on February 6 and 7 respectively. Each interview lasted no longer than one hour. All interviewees were consensual to being interviewed and understood the purpose of the interview. Since the interviewees were teachers currently employed in the school, the researcher refrained from using any recording devices in ensuring the confidentiality and comfort of the teachers. The researcher took down notes and transcribed them immediately upon the completion of each interview.
Data Analysis

In doing data analysis, the researcher used the same method employed under research objective one – content analysis. In examining the interview, repetitive themes were noted, grouped, and identified.


The last step in the data collection strategy for this mixed method research was the analysis of documents in the forms of lesson plans, assignments or projects (Appendix G to R). Documents represent a good source for text data in any qualitative study as one distinct advantage is that the text information belongs to the participant who has normally given thoughtful attention in producing it (Creswell, 2002). The researcher collected parts of lesson plans, assignments and projects from the interviewees to provide support to the teacher’s application and practices of the two principles of learning constructs; Bloom Taxonomy and Problem-based learning (see Questions 6 and 7 of Appendix F).

Research Objective Three. To develop an effective teacher leadership framework for gifted education in Thailand.

To address research objective 3: To develop an effective teacher leadership framework for gifted education in Thailand, findings obtained from data collection corresponding to research questions 1 and 2 were utilized, in drawing up an effective teacher leadership framework. An email method of soliciting validation from experts was then carried out as
opposed to the researcher’s preferred choice of focus group discussion. As time was the primary consideration as all the invited experts held key positions in their respective organizations, the researcher opted to email the drafted framework instead, along with the appropriate literature for the experts’ consideration. Five experts from the field of educational leadership and gifted education were invited. They represent the three major areas; School Leaders, Teacher Leaders, and Principles of Learning. (see Table 33 for list of experts for Framework).

Summary of the Research Process

This research utilized an explanatory mixed method design and Table 6 represents a summary of the research process utilized.

Table 6. Summary of the Research Process

<table>
<thead>
<tr>
<th>Research Objective</th>
<th>Source of Data or Sample</th>
<th>Data Collection or Research Instrument</th>
<th>Data Analysis</th>
<th>Expected Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To identify the effective teacher leadership in gifted education.</td>
<td>Review of related research, theories, books, journals, publications Validation from experts in gifted education</td>
<td>Review key and recurring themes on teacher leadership by using Dendrogram</td>
<td>Content Analysis</td>
<td>The effective teacher leadership in gifted education.</td>
</tr>
</tbody>
</table>
**Table 6. Summary of the Research Process (continued)**

<table>
<thead>
<tr>
<th>Research Objective</th>
<th>Source of Data or Sample</th>
<th>Data Collection or Research Instrument</th>
<th>Data Analysis</th>
<th>Expected Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. To identify the current teacher leadership practices that exist in gifted education in Thailand.</td>
<td>Teachers employed at Mahidol Wittayanusorn School. Top-Performing Teachers at Mahidol Wittayanusorn School</td>
<td>Teacher Leadership in Gifted Education Survey Validation by experts using Item Objective Congruence Form One-on-one interview Document analysis</td>
<td>Statistical Analysis: Frequency, percentage, mean and standard deviation. Qualitative content analysis</td>
<td>Current practices of teacher leadership that exist in gifted education in Thailand.</td>
</tr>
<tr>
<td>3. To develop an effective teacher leadership framework for gifted education in Thailand.</td>
<td>Teacher leadership literature Leadership theories Research related to Gifted education Learning principles related to giftedness Results derived from objectives 1 and 2</td>
<td>Framework development Validation of framework by experts</td>
<td>Validation of framework by experts</td>
<td>An effective teacher leadership framework for gifted education in Thailand</td>
</tr>
</tbody>
</table>
CHAPTER IV

RESEARCH FINDINGS

The primary purpose of this research was to identify an effective teacher leadership framework for gifted education in Thailand. The data and findings presented in this chapter are organized according to the three research objectives.

Part one represents a qualitative component that required analysis into contents read from numerous books, journals and publications in addressing research objective 1: To identify the effective teacher leadership for gifted education.

Part two, which was an attempt to address research objective 2: To identify the current teacher leadership practices that exist in gifted education in Thailand, saw sequential mixed method launches of data collection strategies; more specifically, the explanatory mixed method design strategy comprising two stages of data collection.

- **First phase** presents findings from the quantitative data collection since it precedes qualitative data collection. Research instrument employed was the *Teacher Leadership for Gifted Education Survey*.

- **Second phase** presents findings from qualitative data collection. Two instruments were used; interview and document. These research instruments were used to investigate major themes that resulted from quantitative data.

Part three addressed research objective 3: To develop an effective teacher leadership framework for gifted education in Thailand will see the integration of the findings obtained from research objectives 1 and 2.
Part 1

Research Objective 1: To identify the effective teacher leadership for gifted education

The effective teacher leadership practices were explored by conducting a content analysis of numerous literatures. Content analysis is a research technique used to replicate and make valid inferences from texts to the contexts of their use. In this study, the researcher adopted a design analysis called the “Problem-Driven Analyses” (Krippendorf, 2013), whereby systematic and extensive document readings (see appendix B) were carried out in order to gauge the recurring themes and keywords on teacher leadership. Besides that, reading selection was also driven by the new knowledge gained from the researcher’s coursework, scholarly experts, and themes that the researcher felt would potentially provide answers to research objective 1, such as school leadership, teacher leadership etc. A dendrogram tree-like diagram, was then used, as illustrated in Appendix A, in mapping out some recurring keywords, phrases, before placing them into clusters/classifications. The researcher then narrowed the clusters by using eliminations and frequencies.

The content analysis led to the findings of nine predictive clusters or constructs leading to effective teacher leadership. They are appended in Table 7.
Table 7. The Effective Teacher Leadership

<table>
<thead>
<tr>
<th>Theory &amp; Source</th>
<th>Keywords</th>
<th>Effective Teacher Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Leadership &amp; Climate (Bamburg &amp; Andrews, 1990; Duke 1982, Green, 2010; Gupton 2010)</td>
<td>School goals, clear mission, communicating goals clearly, academic goals.</td>
<td><strong>I. School Leadership &amp; Climate</strong>&lt;br&gt;1) The school goals are defined and communicated to me.</td>
</tr>
<tr>
<td>Principal Leadership (Green, 2012; Hallinger &amp; Murphy, 1985)</td>
<td>Communicate learning objectives, academic performance, instructional goals, communicate classroom objectives.</td>
<td>2) The curriculum goals are achievable by my students.</td>
</tr>
<tr>
<td>Balanced Leadership (Blasé, Blasé, Phillips, 2010)</td>
<td>School culture, positive, supportive, encouraging, organizational culture, mutual respect, collective beliefs, recognition.</td>
<td>3) The administrators encourage teachers to be leaders in the school.</td>
</tr>
<tr>
<td>Distributed Leadership (Ash &amp; Persall, 2000; Bennet, Harvey, Wise, &amp; Woods, 2003; Burke, 2003; Chrispeels, 2004; Gronn, 2000)</td>
<td>two-way communication, instructional leadership, teachers” satisfaction, positive teaching &amp; learning environment, participatory decision, shared decision making</td>
<td><strong>II. Distributed Leadership</strong>&lt;br&gt;4) The administrators and teachers work positively as a team and share good partnership.</td>
</tr>
<tr>
<td>Principal leadership (Green, 2010)</td>
<td>discussion, value opinions</td>
<td>5) The administrators involve teachers in decision making concerning school improvement, student learning, curriculum planning etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6) The administrators and teachers share open communication where teachers are able to freely discuss their opinions and concerns towards school improvement and student learning.</td>
</tr>
</tbody>
</table>
Table 7. The Effective Teacher Leadership (continued)

<table>
<thead>
<tr>
<th>Theory &amp; Source</th>
<th>Keywords</th>
<th>Effective Teacher Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher leadership: Barth, 2001; Crowther, Kaagen, Ferguson, &amp; Hann, 2002.</td>
<td>Reflective practice</td>
<td>7) I am satisfied with the teaching and learning environment that exists in the school.</td>
</tr>
<tr>
<td>Informal leadership: Collay, 2013, Harris &amp; Muijs, 2003, 2005</td>
<td>Modeling good example, persuasive, congeniality, good relationship with colleagues, mutual trust and respect, good listener.</td>
<td>III. Relationship &amp; Influence 8) I find time to exchange ideas and reflect with my colleagues on our teaching practices. 9) I consider myself persuasive and can influence my colleagues on our teaching practices.</td>
</tr>
<tr>
<td>Teacher leadership: Barth, 2001; Crowther, Kaagen, Ferguson, &amp; Hann, 2002; Harris &amp; Muijs, 2003, 2005</td>
<td>Informal leadership, teacher leaders, initiative</td>
<td>10) I listen attentively to my colleagues when they talk about their teaching experience. 11) I give advice to my colleagues when I feel an idea is not appropriate. 12) I try to initiate ideas or new methods with my colleagues to improve our teaching 13) I am happy assisting my colleagues in non-teaching related issues.</td>
</tr>
<tr>
<td>Theory &amp; Source</td>
<td>Keywords</td>
<td>Effective Teacher Leadership</td>
</tr>
<tr>
<td>----------------</td>
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<td>-----------------------------</td>
</tr>
<tr>
<td>Facilitating Collaboration in School (Gupton, 2010; Mitchell &amp; Sackney 2001)</td>
<td>Collaborative culture, collective responsibility, multiple forms of teams, team leadership</td>
<td>14) I respect and understand the different values and beliefs of my colleagues.</td>
</tr>
<tr>
<td>Forming partnership (Gupton, 2010; Green, 2010)</td>
<td>Capacity-building, share, collegial partnership, accept differences in others, collaborative communities of practitioners.</td>
<td>15) I share teaching materials and teaching strategies with my colleagues.</td>
</tr>
<tr>
<td></td>
<td>Respect and trust, good interpersonal relations, collaborative spirit.</td>
<td>16) I can seek help whenever the need arises for good and creative teaching ideas from my colleagues.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17) I am comfortable having my class observed anytime by my colleagues.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18) I welcome critical feedback and help from my colleagues.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19) There is a climate of trust and respect for each other among colleagues.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20) There is strong collaboration among teachers in my department with teachers in other departments.</td>
</tr>
<tr>
<td>Theory &amp; Source</td>
<td>Keywords</td>
<td>Effective Teacher Leadership</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Professional Learning Communities (Toole, Seashore-Louis, 2002; Wiley, 2001)</td>
<td>Peer reflecting, learning, shared purpose, shared objectives</td>
<td>V. Professional Learning Community</td>
</tr>
<tr>
<td></td>
<td>Willingness to learn from one another, community learning,</td>
<td>21) Teachers in my school share good relationship with each other personally and professionally.</td>
</tr>
<tr>
<td></td>
<td>Self-improvement. Motivated, enthusiastic, passionate about teaching</td>
<td>22) Teachers in my school actively engage in discussions regarding improvements in teaching through social network, discussion forums etc.</td>
</tr>
<tr>
<td></td>
<td>Community involvement with members within school, joint collaboration</td>
<td>23) Teachers in my department have a scheduled time to reflect and discuss teaching practices. (*regular=at least once a month)</td>
</tr>
<tr>
<td></td>
<td>Teaching, observing, assessing, reflecting, inquiry spirit, experiment</td>
<td>24) Teachers in my department actively share news gained from reading, attending training or workshops with each other.</td>
</tr>
<tr>
<td></td>
<td>Collaborative communities, problem solving, risk taking, innovation, creativity</td>
<td>25) Teachers in my department discuss and share new instructional techniques and strategies in formal/informal setting. (excluding department meetings)</td>
</tr>
<tr>
<td></td>
<td>Professional growth, self-determination, autonomy, intrinsic, extrinsic reward, incentives</td>
<td>26) Teachers in my department welcome critical feedback and comments from colleagues.</td>
</tr>
<tr>
<td>Motivation (Hoy and Hoy, 2009)</td>
<td></td>
<td>VI. Professional Development</td>
</tr>
<tr>
<td>Promote teachers’ professional growth (Blasé and Blasé, 2004)</td>
<td></td>
<td>26) Teachers are supported with regular training sessions on latest instructional practices</td>
</tr>
</tbody>
</table>
### Table 7. The Effective Teacher Leadership (continued)

<table>
<thead>
<tr>
<th>Theory &amp; Source</th>
<th>Keywords</th>
<th>Effective Teacher Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff development (Blasé and Blasé, 2004).</td>
<td>Pedagogical knowledge, regular training, professional materials, resources, instructional materials, technology</td>
<td>attend workshops and conferences.</td>
</tr>
<tr>
<td></td>
<td>Training hours, time for reflection, learning, schedule time, financial support</td>
<td>27) Teachers are supported with regular training sessions on latest instructional practices</td>
</tr>
<tr>
<td></td>
<td>Take initiative to improve teaching, reflective, views education is lifelong learning</td>
<td>28) Teachers are supported with professional resources, materials, and technology.</td>
</tr>
<tr>
<td>Teaching and learning (Hoy and Hoy, 2009;</td>
<td>29) Teachers are allotted and encouraged to dedicate fixed-hours of time towards professional development.</td>
<td></td>
</tr>
<tr>
<td>Transformational leadership (Bass, 1998; Northouse, 2010)</td>
<td>Trustworthiness, leadership, creative, communication</td>
<td>30) My school frees time for teachers to develop professionally.</td>
</tr>
<tr>
<td></td>
<td>Provide inspiration, stimulate change, improvements</td>
<td>31) My school provides financial program for individual development</td>
</tr>
<tr>
<td></td>
<td>Inspire, motivate, model to both teachers and students</td>
<td>32) I try to search and read new teaching techniques to improve my professional skills</td>
</tr>
<tr>
<td>VII. Transformational leadership</td>
<td></td>
<td>33) I make small conversations with students before and after class to get to know them better as individuals.</td>
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<tr>
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<td></td>
<td>34) I integrate my lessons with issues on morality and ethics.</td>
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<td>35) I communicate the learning goals to my students and motivate them towards the goals.</td>
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<tr>
<th>Theory &amp; Source</th>
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<tr>
<td></td>
<td>Enhance relationship, interpersonal skills</td>
<td>36) I establish personal relationships with my students (eg. their family background, their aspiration, understanding them as a person)</td>
</tr>
<tr>
<td></td>
<td>Provide feedback, transform change, encourage problem solving</td>
<td>37) I avoid distractions from individual students (eg. students who are not paying attention, unfocused, talking, playing their computer, mobiles while teacher is teaching etc.) by talking to them and try to find ways to solve the problem.</td>
</tr>
<tr>
<td></td>
<td>Pedagogical knowledge, content knowledge, gifted knowledge</td>
<td>38) I use new instructional approaches and innovative ways in motivating my students to learn.</td>
</tr>
<tr>
<td></td>
<td>Human thinking, high ability students, cognitive and affective domains, divergent vs convergent thinking</td>
<td>39) I have an understanding of Bloom”s Taxonomy of Learning from my professional/teacher training.</td>
</tr>
<tr>
<td>Revised Bloom’s Taxonomy: (Anderson, &amp; Krathwohl, 2001; Gifted thinking: Davis &amp; Rimm, 2004; Tomlinson, Kaplan, Renzulli, Purcell, Leppien, &amp; Burns, 1999.)</td>
<td></td>
<td>40) I am aware of the varying levels of thinking in Bloom and consciously plan my lessons to take my students gradually up the taxonomy levels.</td>
</tr>
<tr>
<td>Theory &amp; Source</td>
<td>Keywords</td>
<td>Effective Teacher Leadership</td>
</tr>
<tr>
<td>----------------</td>
<td>----------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Critical Thinking: Dixon, Prater, Vine, Wark, Williams, &amp; Hanchon, 2004.</td>
<td>Challenging environment</td>
<td>41) I use the inductive approach more than the deductive approach in my teaching to guide students’ thinking.</td>
</tr>
<tr>
<td></td>
<td>Critical, creative thinking, 21st century thinking, higher order thinking</td>
<td>42) My lessons encourage the application of the higher order thinking skills (analyze, evaluate and create).</td>
</tr>
<tr>
<td></td>
<td>Constructivist classroom, learning must be meaningful, cooperative learning, challenging environment</td>
<td>43) I use questioning, role-playing, debates, brainstorming, concept maps, peer-interaction etc. in my classrooms (please specify below your most used instructional technique. You may specify more than one technique)</td>
</tr>
<tr>
<td></td>
<td>Peer learning, communication, independent study, discussion, decision making, inductive, deductive approach</td>
<td>44) I see assessments as a measure of improving my students’ higher order thinking skills.</td>
</tr>
<tr>
<td>Constructivism; Vygotsky, 18th century; Gabler &amp; Schroeder, 2003</td>
<td>Creativity, problem solving skills, Variety of teaching methods to allow opportunities to initiate and direct their own learning.</td>
<td>IX) Problem-based Learning</td>
</tr>
<tr>
<td>Problem-based learning: Gallagher &amp; Stepien, 1996; Hmelo-Silver, 2004</td>
<td></td>
<td>45) I use effective questioning (eg. triggering, probing, analyzing, re-directing, follow-up etc. typed of questions) in starting my lesson and throughout the course of my lesson.</td>
</tr>
<tr>
<td>Inquiry-based: (Cochran-Smith &amp; Lytle, 2009;</td>
<td></td>
<td>46) I introduce significant real-life issues and authentic problems to my students to solve.</td>
</tr>
</tbody>
</table>
Table 7. The Effective Teacher Leadership (continued)

<table>
<thead>
<tr>
<th>Theory &amp; Source</th>
<th>Keywords</th>
<th>Effective Teacher Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Strategies for the Gifted: Croft, 2003; VanTassel-Baska, 2003</td>
<td>47) I do more peer-group in the classroom tasks than allow students to work individually. 48) I assign students at least one complex task in one semester to allow for self-directed study in their groups to solve a problem. 49) I create new teaching strategies with other teachers. 50) I prefer using open-ended questions in assessments to measure my students’ creativity and problem-solving skills.</td>
<td></td>
</tr>
</tbody>
</table>

Summary of Findings

The findings obtained from content analysis in response to research question 1: To identify the effective teacher leadership for gifted education led to nine identifiable constructs and they are: (1) School leadership and climate; 2) Distributed leadership; 3) Relationship and influence; 4) Collaboration; 5) Professional learning community; 6) Professional development; 7) Transformational Leadership; 8) Bloom’s Taxonomy of Cognitive Domain; and 9) Problem-based learning.

These nine constructs have been found to be consistently supported by past research, and literatures to be determinants to teacher leadership and gifted learning. Therefore, they can inform some sort of deliberations about the practices of effective teacher leadership for gifted education.
Part II

Research Objective 2: To identify the current teacher leadership practices for gifted education.

In an attempt to answer research objective two: to identify the current teacher leadership practices that exist at Mahidol Wittayanusorn School, the researcher carried out the research based on an explanatory mixed method design, comprising three varied data collection method, and launched them sequentially.

Step I: A Teacher Leadership for Gifted Education Survey
Step II: Interview
Step III: Document

Also called the explanatory two-phase model, this is said to be the most popular form of mixed method design in educational research (Creswell, 1994). This design consists of collecting the quantitative data first, and then using the findings for further investigation on significant issues that emerged from the quantitative data.

In this study, the researcher first launched a survey entitled “Teacher Leadership for Gifted Education” with all teachers employed by the school. This was then followed by the second step, a qualitative data collection of a one-on-one interview. The third and final step was analyses on documents. Both the qualitative data collection strategies were useful in providing refinements and verifications to certain key issues that emerged from the findings of the survey.
**Step I: Teacher Leadership for Gifted Education Survey.**

The survey was administered with all 83 teachers at Mahidol Wittayanusorn School at the end of January to early February, 2014 in search for answers to research objective two: *to identify the current teacher leadership practices* that exist at Mahidol Wittayanusorn School. Surveys were placed in individual envelopes and handed personally by the researcher to the respective teachers. Teachers were then requested to return the surveys in a drop-box that was prepared in the researcher’s department, with a pre-set deadline.

There were altogether 60 questions in the survey and their breakdown is as follows. 8 demographic questions, 50 structured questions related to the nine identified teacher leadership constructs, which were obtained from findings of research objective one; and 2 open-ended opinion questions, which did not receive much response, hence will be disregarded in the analysis. The survey used the Likert 5-point scale measurement, with representations of 5=Always; 4=Often; 3=Sometimes; 2=Rarely; and 1=Never.

The discussions on demographic profile, with analyses on frequencies, means and standard deviation will precede the analyses carried out on items related to the nine constructs.

**Demographic Data Analysis**

*Age:* Analysis of the demographic data obtained from the returned Teacher Leadership Survey appended in Table 8, revealed that out of the 77 teacher respondents, 42% were males and 48% were females. 10% of the respondents did not indicate their gender. The average age was in age group 5 which refers to respondents from the ages between 41-45 years old. The youngest age group was from 21-25 years old, with two teachers in this category; and the oldest age group from 56 years above, had 3 teachers. A total of 18 teachers did not indicate their age.
Educational Qualifications: Teachers at Mahidol Wittayanusorn School score well in terms of educational qualifications. 5% of the teachers hold a doctorate, while a large percentage of teachers are master degree holders at 64%, while a small percentage of only 9% are bachelor degree graduates. Also 22% of the teachers abstained from declaring this information.

Study Plans: Interestingly, yet not surprisingly, Mahidol Wittayanusorn teachers value lifelong learning as the following data obtained from „future study plans“ showed that 21% of the respondents are presently undergoing their studies either in Master”s or Doctorate. An impressive 39% indicated that they have plans to further their studies, while 22 % has no plans to pursue a higher education. 18% of the respondents chose not to answer this question.

Teaching Experience: The average years of experience was at 8.1 years. The longest years of teaching experience for respondents at Mahidol Wittayanusorn School was at 18 years, while the lowest teaching experience was at 4 months. 27 respondents did not indicate an answer, which accounts to 35% of the teacher respondents.

Gifted Training: 34% of the respondents indicated that they had received some gifted training and 29% mentioned that they did not have any training in teaching the gifted. A large percentage of 38% respondents did not provide an answer to this question, possibly due to some difficulty in ascertaining if any training they had received fell in the „gifted training” category.
Table 8. Demographic Characteristics of the Population

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percentage</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>32</td>
<td>42%</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>37</td>
<td>48%</td>
<td></td>
</tr>
<tr>
<td>Missing data</td>
<td>8</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum age</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum age</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing data</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Highest Qualification</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor</td>
<td>7</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>Master’s</td>
<td>49</td>
<td>64%</td>
<td></td>
</tr>
<tr>
<td>Doctorate</td>
<td>4</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Missing data</td>
<td>17</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td><strong>Study Plans</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presently studying</td>
<td>16</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>Yes, in the future</td>
<td>30</td>
<td>39%</td>
<td></td>
</tr>
<tr>
<td>No, no plans</td>
<td>17</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>Missing data</td>
<td>14</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td><strong>Teaching Experience</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td>8.1 years</td>
</tr>
<tr>
<td>Minimum</td>
<td></td>
<td></td>
<td>0.4 years</td>
</tr>
<tr>
<td>Maximum</td>
<td></td>
<td></td>
<td>17 years</td>
</tr>
<tr>
<td>Missing data</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gifted Training</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>26</td>
<td>34%</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>22</td>
<td>29%</td>
<td></td>
</tr>
<tr>
<td>Missing data</td>
<td>29</td>
<td>38%</td>
<td></td>
</tr>
</tbody>
</table>
Quantitative Analysis on Teacher Leadership Survey

The findings from the survey and their interpretations will be discussed based on the nine constructs as follows:

1) School leadership and climate interpretation. Mean analyses and standard deviations for each item under school leadership are shown in Table 9. Respondents found that the school administrators rarely or sometimes encourage teachers to be leaders in the school with a moderate mean score of 2.96, whereas all teachers acknowledged that the school goals are always defined and communicated to them at a mean of 4.13, in comparison to if they felt that the curriculum goals are achievable by their students. They scored this item high, at a mean score of 3.95.

Table 9. Mean Score, Standard Deviation of School Leadership & Climate

<table>
<thead>
<tr>
<th>Questions</th>
<th>Mean</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The school goals are defined and communicated to me</td>
<td>4.13</td>
<td>.94</td>
<td>High</td>
</tr>
<tr>
<td>The curriculum goals are achievable by my students</td>
<td>3.95</td>
<td>.79</td>
<td>High</td>
</tr>
<tr>
<td>The administrators encourage teachers to be leaders in the school.</td>
<td>2.96</td>
<td>1.06</td>
<td>Moderate</td>
</tr>
<tr>
<td>School leadership and Climate</td>
<td>3.68</td>
<td>.93</td>
<td>High</td>
</tr>
</tbody>
</table>

2) Distributed leadership interpretation. Mean analyses and standard deviations for each item under distributed leadership are shown in Table 10. The findings showed only one item scored high - that teachers were generally moderately satisfied with the teaching and learning environment of the school with a mean score of 3.60. The other items under this
construct rated moderately, especially on participation in decision-making and open communication, at mean scores of 2.90 and 2.61 respectively. The combined mean for distributed leadership just surpassed the „sometimes“ scale at 3.15, which means distributed leadership is moderately experienced at the school.

**Table 10. Mean Score, Standard Deviation of Distributed Leadership**

<table>
<thead>
<tr>
<th>Questions</th>
<th>Mean</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The administrators and teachers work positively as a team and share good partnership</td>
<td>3.48</td>
<td>1.13</td>
<td>Moderate</td>
</tr>
<tr>
<td>The administrators involve teachers in decision-making concerning school improvement, student learning, curriculum planning etc.</td>
<td>2.90</td>
<td>1.09</td>
<td>Moderate</td>
</tr>
<tr>
<td>The administrators and teachers share open communication where teachers are able to freely discuss their opinions and concerns towards school improvement and student learning</td>
<td>2.61</td>
<td>1.06</td>
<td>Moderate</td>
</tr>
<tr>
<td>I am satisfied with the teaching and learning environment that exists in the school</td>
<td>3.60</td>
<td>.91</td>
<td>High</td>
</tr>
<tr>
<td>Distributed leadership</td>
<td>3.15</td>
<td>1.05</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

3) **Relationship and influence interpretation.** Mean analyses and standard deviations for each item under this construct are shown in Table 11. The findings showed that teachers were highly respectful of the differences in their colleagues’ beliefs and values, with a very high mean score of 4.52. The teachers also rated two items equally. The mean scores for providing colleagues with help in non-teaching related problems and listening attentively to the colleagues talk about teaching experience both scored high means of 4.35. In comparison, the item that scored moderate mean of 3.38 was that, teachers felt that they were only *sometimes* persuasive and
may only sometimes be able to influence their colleagues. The combined mean for the construct of relationship and influence was overall high at 3.99.

### Table 11. Mean Score, Standard Deviation of Relationship and Influence

<table>
<thead>
<tr>
<th>Questions</th>
<th>Mean</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I find time to exchange ideas and reflect with colleagues on our teaching practices</td>
<td>3.60</td>
<td>1.04</td>
<td>High</td>
</tr>
<tr>
<td><strong>I consider myself persuasive and can influence my colleagues</strong></td>
<td><strong>3.38</strong></td>
<td>.76</td>
<td>Moderate</td>
</tr>
<tr>
<td>I listen attentively to my colleagues when they talk about their teaching experiences</td>
<td>4.35</td>
<td>.77</td>
<td>High</td>
</tr>
<tr>
<td>I give advice to my colleagues when I feel an idea is inappropriate</td>
<td>3.69</td>
<td>.93</td>
<td>High</td>
</tr>
<tr>
<td>I try to initiate ideas or new methods with my colleagues to improve our teaching</td>
<td>4.02</td>
<td>.84</td>
<td>High</td>
</tr>
<tr>
<td>I am happy assisting my colleagues in non-teaching related issues (eg. the use of audio-visuals, classroom equipment, Microsoft skills or other programs)</td>
<td>4.35</td>
<td>.71</td>
<td>High</td>
</tr>
<tr>
<td>I respect and understand the different values and beliefs of my colleagues</td>
<td>4.52</td>
<td>.80</td>
<td>Very High</td>
</tr>
<tr>
<td><strong>Relationship and Influence</strong></td>
<td><strong>3.99</strong></td>
<td>.84</td>
<td>High</td>
</tr>
</tbody>
</table>

4) **Collaboration interpretation.** Mean analyses and standard deviations for each item under this construct are shown in Table 12. The findings showed that collaborative spirit is strong between teachers in the department as indicated by the combined items high mean score of 4.12. All items under this construct scored high, though one item on teachers collaborating with teachers from other departments showed a slightly „lower” high. This demonstrates that the collaboration between teachers in the same department is significantly stronger than the
collaboration between teachers of other departments. The item that received the highest mean score in the collaboration construct is on teachers’ attitude towards receiving constructive feedback and help from colleagues. The positively high mean score of 4.32 indicates that teachers at Mahidol Wittayanusorn School are positively receptive (often) towards colleagues’ suggestions.

**Table 12. Mean Score, Standard Deviation of Collaboration**

<table>
<thead>
<tr>
<th>Questions</th>
<th>Mean</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I share teaching materials and teaching strategies with my colleagues</td>
<td>4.26</td>
<td>.85</td>
<td>High</td>
</tr>
<tr>
<td>I can seek help whenever the need arises for good and creative teaching ideas from my colleagues</td>
<td>4.13</td>
<td>.94</td>
<td>High</td>
</tr>
<tr>
<td>I am comfortable having my class observed anytime by my colleagues</td>
<td>4.04</td>
<td>1.01</td>
<td>High</td>
</tr>
<tr>
<td>I welcome constructive feedback and help from my colleagues</td>
<td>4.32</td>
<td>.73</td>
<td>High</td>
</tr>
<tr>
<td>There is a climate of trust and respect for each other among colleagues</td>
<td>4.28</td>
<td>.74</td>
<td>High</td>
</tr>
<tr>
<td><strong>There is strong collaboration among teachers in my department with teachers in other departments</strong></td>
<td><strong>3.71</strong></td>
<td><strong>1.22</strong></td>
<td>High</td>
</tr>
</tbody>
</table>

Collaboration 4.12 .92 High

5) **Professional learning community interpretation.** Mean analyses and standard deviations for each item under this construct are shown in Table 13. The findings from Professional Learning Community construct had mean scores ranging from 2.84 to 3.86. The highest mean score of 3.86 was on teachers forging good relationship with each other
personally and professionally; and lowest mean score of moderate 2.84 was on whether teachers had regular scheduled time for reflection and discussion with colleagues on teaching practices. The overall mean for PLC was perceived moderate at 3.38, which means that teachers at Mahidol Wittayanusorn School see room for improvement for PLC practices.

### Table 13. Mean Score, Standard Deviation of Professional Learning Community

<table>
<thead>
<tr>
<th>Questions</th>
<th>Mean</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers in the school share good relationship with each other personally and professionally</td>
<td>3.86</td>
<td>.76</td>
<td>High</td>
</tr>
<tr>
<td>Teachers in my school actively engage in discussion regarding improvements in teaching through social network, discussion forums etc.</td>
<td>3.13</td>
<td>1.16</td>
<td>Moderate</td>
</tr>
<tr>
<td>Teachers in my department have a regular scheduled time to reflect and discuss teaching practices (*regular=at least once a month)</td>
<td>2.84</td>
<td>1.27</td>
<td>Moderate</td>
</tr>
<tr>
<td>Teachers in my department actively share new ideas gained from reading, attending training or workshops with each other</td>
<td>3.34</td>
<td>1.02</td>
<td>Moderate</td>
</tr>
<tr>
<td>Teachers in my department discuss and share new instructional techniques and strategies in a formal/informal setting (excluding department meeting)</td>
<td>3.43</td>
<td>1.06</td>
<td>Moderate</td>
</tr>
<tr>
<td>Teachers in my department welcome critical feedback and comments from colleagues</td>
<td>3.67</td>
<td>.92</td>
<td>High</td>
</tr>
</tbody>
</table>

Professional Learning Community | 3.38 | 1.03 | Moderate

6) **Professional development interpretation.** Mean analyses and standard deviations for each item under this construct are shown in Table 14. The overall mean for professional development is 3.57, which means that teachers generally felt that the school’s professional
development plans or programs are fairly in place. However, two items scored significantly moderate; at mean scores of 2.71 and 2.88 respectively. Teachers felt that rarely does the school frees time for teachers to develop professionally as well as rarely is there a financial program for individual development. In contrast, two items scored favorably at the highest mean scores for this construct, at 4.13. Teachers found that they were often supported with professional resources, materials and technology, and that they often try to search and read new teaching techniques to improve their professional skills.

**Table 14. Mean Score, Standard Deviation of Professional Development**

<table>
<thead>
<tr>
<th>Questions</th>
<th>Mean</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers are supported with regular training sessions on latest instructional practices, attend workshops and conferences. <em>(can be either school or teacher initiative)</em></td>
<td>3.58</td>
<td>1.04</td>
<td>High</td>
</tr>
<tr>
<td>Teachers are supported with professional resources, materials and technology.</td>
<td>4.13</td>
<td>.82</td>
<td>High</td>
</tr>
<tr>
<td>Teachers are allotted and encouraged to dedicate fixed-hours of time towards professional development</td>
<td>3.99</td>
<td>1.29</td>
<td>High</td>
</tr>
<tr>
<td><strong>My school frees time for teachers to develop professionally</strong></td>
<td><strong>2.71</strong></td>
<td><strong>1.10</strong></td>
<td>Moderate</td>
</tr>
<tr>
<td>My school provides financial program for individual development</td>
<td>2.88</td>
<td>1.19</td>
<td>Moderate</td>
</tr>
<tr>
<td>I try to search and read new teaching techniques to improve my professional skills</td>
<td>4.13</td>
<td>.71</td>
<td>High</td>
</tr>
<tr>
<td><strong>Professional Development</strong></td>
<td><strong>3.57</strong></td>
<td><strong>1.03</strong></td>
<td>High</td>
</tr>
</tbody>
</table>
7) **Transformational leadership interpretation.** Mean analyses and standard deviations for each item under this construct are shown in Table 15. The overall combined mean score is high at 3.88, with three items scoring above the „often“ scale. Teachers indicated that they *often* communicated and motivated the learning goals to their students (mean=4.31) and integrated their lessons with issues on morality and ethics (mean=4.12). The same with making conversations with students before and after class (mean=4.06). The only item that surprisingly scored a moderate mean within this construct (mean=3.30) was that teachers only *sometimes* dealt with class disruptions from individual students who were not focused during class due to reasons such as talking with friends, playing their mobile phone, etc. Also scoring not that highly (just surpassing the moderate scale) is on teachers’ effort in establishing personal relationships which has been defined as getting to know the students’ family backgrounds, their career aspirations etc. The mean score of this item was 3.56, which was in contrast with the item where teachers take effort to have small conversations before and after class (mean score 4.06). This leads to an interpretation that there is a lack of personal conversations developed outside classroom hours, even though the school is a boarding school.

**Table 15. Mean Score, Standard Deviation of Transformational Leadership**

<table>
<thead>
<tr>
<th>Questions</th>
<th>Mean</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I make small conversations with students before and after class to get to know them better as individuals</td>
<td>4.06</td>
<td>.68</td>
<td>High</td>
</tr>
<tr>
<td>I integrate my lessons with issues on morality and ethics</td>
<td>4.12</td>
<td>.93</td>
<td>High</td>
</tr>
<tr>
<td>I communicate the learning goals to my students and motivate them towards the goals</td>
<td>4.31</td>
<td>.78</td>
<td>High</td>
</tr>
<tr>
<td>I establish personal relationships with my students (eg. their family background, their aspiration, understanding them as a person)</td>
<td>3.56</td>
<td>.10</td>
<td>High</td>
</tr>
</tbody>
</table>
Table 15. Mean Score, Standard Deviation of Transformational Leadership (continued)

<table>
<thead>
<tr>
<th>Questions</th>
<th>Mean</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I avoid distractions from individual students (eg. students who are not</td>
<td>3.30</td>
<td>1.20</td>
<td>Moderate</td>
</tr>
<tr>
<td>paying attention, unfocused, talking, plating their computer, mobiles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>while teacher is teaching etc.) by talking to them and try to find ways to</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>solve the problem</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I use new instructional approaches and innovative ways in motivating my</td>
<td>3.92</td>
<td>.79</td>
<td>High</td>
</tr>
<tr>
<td>students to learn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transformational Leadership</td>
<td>3.88</td>
<td>.74</td>
<td>High</td>
</tr>
</tbody>
</table>

8) Bloom’s Taxonomy of learning interpretation. Mean analyses and standard deviations for each item under this construct are shown in Table 16. The findings reflected that teachers were rarely aware of one important principle of learning – Bloom’s Taxonomy, scoring at moderate means of 2.95 and 2.86 respectively for questions related to the taxonomy. This could indicate that teachers did not possess clear understanding of the theories on how human process their thinking skills, which is crucial in aiding any curriculum design, subsequently having an impact on how teachers plan and implement their classroom instructions. However, two items were found to offset these lowly-scored theories on educational psychology; scoring high means of 4.25 and 4.03 respectively. This can be interpreted that teachers do often practice instructional strategies that utilize the higher order thinking skills, and these strategies range from questioning, role-playing, debates, brainstorming etc. which are constructivist in nature, therefore reinforces a learning environment which is student-centered.
**Table 16. Mean Score, Standard Deviation of Bloom’s Taxonomy**

<table>
<thead>
<tr>
<th>Questions</th>
<th>Mean</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have an understanding of Bloom’s Taxonomy of</td>
<td>2.86</td>
<td>1.46</td>
<td>Moderate</td>
</tr>
<tr>
<td>learning from my professional/teacher training</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I aware of the varying levels of thinking in Bloom</td>
<td>2.95</td>
<td>1.49</td>
<td>Moderate</td>
</tr>
<tr>
<td>and consciously plan my lessons to take my students gradually up the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>taxonomy levels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I use the *inductive approach more than the</td>
<td>3.65</td>
<td>.78</td>
<td>High</td>
</tr>
<tr>
<td>deductive approach in my teaching to guide students”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>thinking. (Inductive approach analyzes pertinent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>facts to generate a concept or principle. Deductive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>approach defines a concept or principle then</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>develops it with facts.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My lessons encourage the application of the higher</td>
<td>4.03</td>
<td>.81</td>
<td>High</td>
</tr>
<tr>
<td>order thinking skills (analyze, evaluate and create)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I use questioning, role-paying, debates,</td>
<td>4.25</td>
<td>.65</td>
<td>High</td>
</tr>
<tr>
<td>brainstorming, concept maps, peer interaction etc. in my classrooms.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I see assessments as a measure of improving my students”</td>
<td>3.91</td>
<td>.83</td>
<td>High</td>
</tr>
<tr>
<td>higher order thinking skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bloom Taxonomy</td>
<td>3.61</td>
<td>1.03</td>
<td>High</td>
</tr>
</tbody>
</table>

9) **Problem-based learning Interpretation.** Mean analyses and standard deviations for each item under this construct are shown in Table 17. One item that scored strongly at high mean of 4.12 was that teachers used effective questioning strategies in starting their lessons as well as throughout the lessons. In contrast, teachers rarely create new teaching strategies with other teachers, with a moderate mean of 2.84. The overall combined mean for problem-based learning items scored high (but at a lower range high) of 3.61, which can be interpreted that
problem-based learning is only *sometimes* used in the teaching and learning at Mahidol Wittayanusorn School.

**Table 17. Mean Score, Standard Deviation of Problem-based Learning**

<table>
<thead>
<tr>
<th>Questions</th>
<th>Mean</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I use effective questioning (eg. triggering, probing, analyzing, re-directing, follow-up etc. - typed of questions) in starting my lesson and throughout the course of my lesson</td>
<td>4.12</td>
<td>.69</td>
<td>High</td>
</tr>
<tr>
<td>I introduce significant real-life issues and authentic problems for my students to solve</td>
<td>3.86</td>
<td>.93</td>
<td>High</td>
</tr>
<tr>
<td>I do more *peer-group in the classroom tasks than allow students to work individually (peer group refers to grouping students to work cooperatively together)</td>
<td>3.77</td>
<td>.84</td>
<td>High</td>
</tr>
<tr>
<td>I assign students at least one complex task in one semester to allow for self-directed study in their groups to solve a problem</td>
<td>3.47</td>
<td>1.11</td>
<td>Moderate</td>
</tr>
<tr>
<td>I create new teaching strategies with other teachers.</td>
<td>2.84</td>
<td>.92</td>
<td>Moderate</td>
</tr>
<tr>
<td>I prefer using open-ended questions in assessments to measure my students” creativity and problem-solving skills.</td>
<td>3.61</td>
<td>1.00</td>
<td>High</td>
</tr>
<tr>
<td><strong>Problem-based Learning</strong></td>
<td>3.61</td>
<td>.91</td>
<td>High</td>
</tr>
</tbody>
</table>

**Summary of the Findings from Survey**

The overall findings obtained from the *Teacher Leadership for Gifted Education Survey* is presented in two parts; first, the summary of the nine constructs; and second, the summary of
items under each construct. The criteria of scale interpretation will be used to guide the discussion.

Under the constructs category, a total of seven constructs scored highly based on the criteria of scale interpretation. All these constructs had means within the high scale range of 3.50 to 4.50. This can be implied that on the whole, the school displays good teacher leadership practices, but only two areas needed enhancement and improvement so that the best teacher leadership practices are evident at the national high school for the gifted. The construct that scored the strongest high is collaboration. In contrast, the two constructs that scored moderately were on professional learning community and distributed leadership as seen in the shaded box.

i. The summary of the nine constructs are appended and summarized below in Table 18 in descending order based on their mean scores.

Table 18. Summary of Means and Standard Deviations of Survey Constructs

<table>
<thead>
<tr>
<th>Rank</th>
<th>Construct</th>
<th>M</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Collaboration</td>
<td>4.12</td>
<td>.91</td>
<td>High</td>
</tr>
<tr>
<td>2</td>
<td>Relationship &amp; Influence</td>
<td>3.99</td>
<td>.84</td>
<td>High</td>
</tr>
<tr>
<td>3</td>
<td>Transformational Leadership</td>
<td>3.88</td>
<td>.75</td>
<td>High</td>
</tr>
<tr>
<td>4</td>
<td>School leadership &amp; Climate</td>
<td>3.68</td>
<td>.93</td>
<td>High</td>
</tr>
<tr>
<td>5</td>
<td>Bloom’s Taxonomy</td>
<td>3.61</td>
<td>1.03</td>
<td>High</td>
</tr>
<tr>
<td>6</td>
<td>Problem-based Learning</td>
<td>3.61</td>
<td>.91</td>
<td>High</td>
</tr>
<tr>
<td>7</td>
<td>Professional Development</td>
<td>3.57</td>
<td>1.03</td>
<td>High</td>
</tr>
<tr>
<td>8</td>
<td>Professional Learning Community</td>
<td>3.38</td>
<td>1.03</td>
<td>Moderate</td>
</tr>
<tr>
<td>9</td>
<td>Distributed Leadership</td>
<td>3.15</td>
<td>1.05</td>
<td>Moderate</td>
</tr>
</tbody>
</table>
Out of the 77 returned surveys, teachers rated collaboration the strongest teacher leadership practice that is experienced at the school, with a high mean score of 4.12, which can be interpreted that the respondents very often felt that the climate of collaboration among teachers permeated in the school. The other six constructs that also fell into the high scale of interpretation were relationship & influence between colleagues (mean=3.99); transformational leadership (mean=3.88); school’s leadership and climate (mean=3.68); Bloom’s Taxonomy (M=3.60); Problem-based learning (M=3.60) and Professional Development (M=3.57).

Despite falling in the high scale range based on criteria of scale interpretation, it should be noted that three out these seven constructs scored their “highs” ranging from 3.57 – 3.60, just surpassing the moderate scale range of 3.50. The three constructs that just surpassed the moderate scale were Bloom’s Taxonomy (M=3.60); Problem-based learning (M=3.60) and Professional Development (M=3.57). What is noteworthy is that, two of the principles of learning for the gifted were the constructs mentioned. The researcher noted these significant results that needed to be followed-up in the next step of data collection – the interview. The above findings also correlated with the earlier significant data obtained from the demographic analysis (Table 8) where only 34% of the teachers clearly indicated that they had training in gifted education/programs, while the remaining 66% responded that they either never had any training on gifted or chose not to answer the question.

ii. Summary of the individual items that scored means based on the criteria of scale interpretation is listed under Table 19. There breakdown according to the scale
interpretations are as follows: Very High = 1 item; High = 33 items and Moderate = 16 items; with no items scoring in Low and Very Low scales.

**Table 19. Summary of Items by Scale Interpretation**

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VERY HIGH</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R&amp;I</td>
<td>I respect and understand the different values and beliefs of my colleagues.</td>
<td>4.52</td>
<td>.80</td>
</tr>
<tr>
<td><strong>HIGH</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R&amp;I</td>
<td>I listen attentively to my colleagues when they talk about their teaching experiences.</td>
<td>4.35</td>
<td>.77</td>
</tr>
<tr>
<td>R&amp;I</td>
<td>I am happy assisting my colleagues in non-teaching related issues.</td>
<td>4.35</td>
<td>.70</td>
</tr>
<tr>
<td>PC</td>
<td>I welcome constructive feedback and help from my colleagues.</td>
<td>4.32</td>
<td>.73</td>
</tr>
<tr>
<td>TL</td>
<td>I communicate the learning goals to my students and motivate them towards the goals.</td>
<td>4.31</td>
<td>.78</td>
</tr>
<tr>
<td>PC</td>
<td>There is a climate of trust and respect for each other among colleagues.</td>
<td>4.28</td>
<td>.74</td>
</tr>
<tr>
<td>PC</td>
<td>I share teaching materials and teaching strategies with my colleagues.</td>
<td>4.26</td>
<td>.85</td>
</tr>
<tr>
<td>BT</td>
<td>I use questioning, role-playing, debates, brainstorming, concept maps, peer interaction etc. in my classrooms.</td>
<td>4.25</td>
<td>.65</td>
</tr>
<tr>
<td>PC</td>
<td>I can seek help whenever the need arises for good and creative teaching ideas from my colleagues.</td>
<td>4.13</td>
<td>.94</td>
</tr>
<tr>
<td>SLC</td>
<td>The school goals are defined and communicated to me.</td>
<td>4.13</td>
<td>.94</td>
</tr>
<tr>
<td>Construct</td>
<td>Item</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td><strong>SLC</strong></td>
<td>The school goals are defined and communicated to me.</td>
<td>4.13</td>
<td>.94</td>
</tr>
<tr>
<td><strong>PD</strong></td>
<td>Teachers are supported with professional resources, materials and technology.</td>
<td>4.13</td>
<td>.82</td>
</tr>
<tr>
<td><strong>PD</strong></td>
<td>I try to search and read new teaching techniques to improve my professional skills.</td>
<td>4.13</td>
<td>.71</td>
</tr>
<tr>
<td><strong>TL</strong></td>
<td>I integrate my lessons with issues on morality and ethics.</td>
<td>4.12</td>
<td>.93</td>
</tr>
<tr>
<td><strong>PBL</strong></td>
<td>I use effective questioning (eg. triggering, probing, analyzing, re-directing, follow-up etc. typed of questions) in starting my lesson and throughout my lesson.</td>
<td>4.12</td>
<td>.69</td>
</tr>
<tr>
<td><strong>TL</strong></td>
<td>I make conversations with students before and after class to get to know them better as individuals.</td>
<td>4.06</td>
<td>.68</td>
</tr>
<tr>
<td><strong>PC</strong></td>
<td>I am comfortable having my class observed anytime by my colleagues.</td>
<td>4.04</td>
<td>1.01</td>
</tr>
<tr>
<td><strong>BT</strong></td>
<td>My lessons encourage the application of higher order thinking skills (analyze, evaluate and create).</td>
<td>4.03</td>
<td>.81</td>
</tr>
<tr>
<td><strong>R&amp;I</strong></td>
<td>I try to initiate new ideas or new methods with my colleagues to improve our teaching.</td>
<td>4.03</td>
<td>.84</td>
</tr>
<tr>
<td><strong>PD</strong></td>
<td>Teachers are allotted and encouraged to dedicate fixed-hours of time towards professional development.</td>
<td>3.99</td>
<td>1.29</td>
</tr>
<tr>
<td><strong>SLC</strong></td>
<td>The curriculum goals are achievable by my students.</td>
<td>3.95</td>
<td>.79</td>
</tr>
<tr>
<td><strong>TL</strong></td>
<td>I use new instructional approaches and innovative ways in motivating my students to learn.</td>
<td>3.92</td>
<td>.79</td>
</tr>
<tr>
<td><strong>BT</strong></td>
<td>I see assessments as a measure of improving my students” higher order thinking skills.</td>
<td>3.90</td>
<td>.83</td>
</tr>
<tr>
<td><strong>PBL</strong></td>
<td>I introduce significant real-life issues and authentic problems to students to solve.</td>
<td>3.85</td>
<td>.93</td>
</tr>
<tr>
<td>Construct</td>
<td>Item</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------------------------------------------------------------</td>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td>HIGH</td>
<td><strong>PLC</strong> Teachers in the school share good relationship with each other personally and professionally.</td>
<td>3.85</td>
<td>.76</td>
</tr>
<tr>
<td></td>
<td><strong>PBL</strong> I do more peer-group in the classroom tasks than allow students to work individually.</td>
<td>3.77</td>
<td>.84</td>
</tr>
<tr>
<td></td>
<td><strong>PC</strong> There is strong collaboration among teachers in my department with teachers in other departments.</td>
<td>3.71</td>
<td>1.22</td>
</tr>
<tr>
<td></td>
<td><strong>R&amp;I</strong> I give advice to my colleagues when I feel an idea is not appropriate.</td>
<td>3.69</td>
<td>.93</td>
</tr>
<tr>
<td></td>
<td><strong>PLC</strong> Teachers in my department welcome critical feedback and comments from colleagues.</td>
<td>3.67</td>
<td>.92</td>
</tr>
<tr>
<td></td>
<td><strong>BT</strong> I use the inductive approach more than the deductive approach in my teaching to guide students’’ thinking.</td>
<td>3.65</td>
<td>.96</td>
</tr>
<tr>
<td></td>
<td><strong>PBL</strong> I prefer using open-ended questions in assessments to measure my students’’ creativity and problem-solving skills.</td>
<td>3.61</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td><strong>DL</strong> I am satisfied with the teaching and learning environment that exists in the school.</td>
<td>3.60</td>
<td>.91</td>
</tr>
<tr>
<td></td>
<td><strong>R&amp;I</strong> I find time to exchange ideas and reflect with my colleagues on our teaching practices.</td>
<td>3.60</td>
<td>1.04</td>
</tr>
<tr>
<td></td>
<td><strong>PD</strong> Teachers are supported with regular training sessions on latest instructional practices, attend workshops and conferences (can be either from school or teacher initiative).</td>
<td>3.58</td>
<td>1.04</td>
</tr>
<tr>
<td></td>
<td><strong>TL</strong> I establish personal relationships with my students (e.g. their family background, career aspirations, understanding them as a person).</td>
<td>3.56</td>
<td>.98</td>
</tr>
<tr>
<td>MODERATE</td>
<td><strong>DL</strong> The administrators and teachers work positively as a team and share good partnership.</td>
<td>3.48</td>
<td>1.13</td>
</tr>
<tr>
<td></td>
<td><strong>PBL</strong> I assign students at least one complex task in one semester to allow for self-directed study in their groups to solve a problem.</td>
<td>3.47</td>
<td>1.11</td>
</tr>
</tbody>
</table>
Table 19. Summary of Items by Scale Interpretation (continued)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MODERATE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLC</td>
<td>Teachers in my department discuss and share new instructional techniques and strategies in a formal/informal setting (<em>excluding department meetings</em>).</td>
<td>3.43</td>
<td>1.06</td>
</tr>
<tr>
<td>R&amp;I</td>
<td>I consider myself persuasive and can influence my colleagues.</td>
<td>3.38</td>
<td>.76</td>
</tr>
<tr>
<td>PLC</td>
<td>Teachers in my department actively share new ideas gained from reading, attending training or workshops with each other.</td>
<td>3.34</td>
<td>1.02</td>
</tr>
<tr>
<td>TL</td>
<td>I avoid distractions from individual students (<em>eg. students who are not paying attention, unfocused, talking, playing their computer, mobiles while teacher is teaching etc.</em>) by talking to them and try to find ways to solve the problem.</td>
<td>3.30</td>
<td>1.20</td>
</tr>
<tr>
<td>PLC</td>
<td>Teachers in my school actively engage in discussions regarding improvements in teaching through social network, discussion forums etc.</td>
<td>3.13</td>
<td>1.16</td>
</tr>
<tr>
<td>SLC</td>
<td>The administrators encourage teachers to be leaders in the school.</td>
<td>2.96</td>
<td>1.06</td>
</tr>
<tr>
<td>BT</td>
<td>I am aware of the varying levels of thinking in Bloom and consciously plan my lessons to take my students gradually up the taxonomy levels.</td>
<td>2.95</td>
<td>1.50</td>
</tr>
<tr>
<td>DL</td>
<td>The administrators involve teachers in decision-making concerning school improvement, student learning, curriculum planning etc.</td>
<td>2.90</td>
<td>1.09</td>
</tr>
<tr>
<td>PD</td>
<td>My school provides financial program for individual development</td>
<td>2.88</td>
<td>1.19</td>
</tr>
<tr>
<td>BT</td>
<td>I have an understanding of Bloom’s taxonomy of Learning from my professional/teacher training</td>
<td>2.86</td>
<td>1.46</td>
</tr>
<tr>
<td>PLC</td>
<td>Teachers in my department have a regular scheduled time to reflect and discuss teaching practices (<em>regular=at least once a month</em>)</td>
<td>2.84</td>
<td>1.27</td>
</tr>
<tr>
<td>PBL</td>
<td>I create new teaching strategies with other teachers</td>
<td>2.84</td>
<td>.92</td>
</tr>
</tbody>
</table>
Table 19. Summary of Items by Scale Interpretation (continued)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODERATE</td>
<td>PD: My school frees time for teachers to develop professionally</td>
<td>2.71</td>
<td>1.10</td>
</tr>
<tr>
<td></td>
<td>DL: The administrators and teachers share open communication where teachers are able to freely discuss their opinions and concerns towards school improvement and student learning</td>
<td>2.61</td>
<td>.92</td>
</tr>
</tbody>
</table>

SLC: School leadership & Climate; DL: Distributed Leadership; R&I: Relationship & Influence; PC: Promoting Collaboration; PLC: Professional Learning Community; PD: Professional Development; TL: Transformational Leadership; BT: Bloom’s Taxonomy; PBL: Problem-based Learning

Findings based on each item under the nine constructs revealed once again that teachers at the school considered their relationship building and influence capacity as one of their strongest teacher leadership practices at the school, with three items under this single construct scoring the highest individual mean scores. (respectful towards colleagues’ different values and beliefs (M=4.52); listen attentively to their colleagues on teaching experiences (M=4.35); and happy to provide assistance on non-teaching related matters (M=4.35). Trailing not far behind is collaboration whereby teachers were positive towards receiving constructive feedback from their colleagues (M=4.32). These findings convey elements of strong interpersonal skills of teachers at Mahidol Wittayanusorn School.

The item that scored moderately at a mean score of 2.61 was under distributed leadership, with improvements indicated for a better level of communication between administrators and teachers, as well as opportunities to express opinions on matters related to school improvements. Despite not having any item falling below the mean score of 2.50, nine items scored means below 3.0, which could mean that these are areas for improvement. In order to excel and remain as the number one high school in Thailand, school leaders at Mahidol
Wittayanusorn School will have to take heed on some of the items that were scored fairly as listed in Table 19 above.

**Step II: Interview**

The second phase of the data analysis in this explanatory mixed method design research saw the researcher conducting interviews with five teachers, in order to obtain additional data to help explain or elaborate on some of the findings from the Teacher Leadership for Gifted Education survey. One-on-one interviews were carried out with the five top-performing teachers who were selected by 24 senior students. The interviews were held on February 6 and 7, 2014, and each session lasted no longer than one hour.

The format of the interviews was semi-structured, and there were 7 open-ended questions (see Appendix F). According to Creswell (2002), open-ended questions that are non-directional in nature will seek a description of the phenomenon being addressed. The questions were also carefully generated, and designed to explore the content, nature, and quality of the teachers’ thoughts and feelings on a few key results obtained from quantitative data, in more detail, as well as to follow-up on some outlier cases.

The teacher participants were informed before-hand of the purpose of the interview, and each interview was conducted separately in nearby classrooms of the teachers’ respective departments. Initially, the plan was to interview a teacher each from biology, chemistry, physics, math and English – a total of five teachers. However, two teachers from one subject received the same nomination counts, hence a total of six were named. However, because of the unavailability of a teacher due to an overseas assignment, the researcher decided to go ahead with the interview, by interviewing only five teachers. The top-performing teachers’ profiles are
listed below in Table 20. The researcher took down notes during the interview, and in order to ensure confidentiality in their opinions, only the teacher’s qualifications are listed. Interestingly, one notable point to take into account is that, the teachers named by students are mostly doctor degree holders, or have plans to pursue their doctoral studies.

Table 20: Top-Performing Teacher’s Profile

<table>
<thead>
<tr>
<th>Gender</th>
<th>Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 1</td>
<td>Ph.D. candidate</td>
</tr>
<tr>
<td>Teacher 2</td>
<td>Masters, with plans to study Ph.D. within 2014.</td>
</tr>
<tr>
<td>Teacher 3</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Teacher 4</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Teacher 5</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Teacher 6 (absent)</td>
<td>Masters, with plans to study Ph.D. in the near future.</td>
</tr>
</tbody>
</table>

Again, in analyzing the interviews, the researcher used the same method that she had earlier used in research question one. A content analysis was undertaken where the responses from the interview were partitioned into content domains for the comparison of themes across individual responses (Strauss, 1987).

Two key questions that were considered warm-up questions and not directly related to the questions asked in the survey was posed to the teachers, so as to ascertain each teacher’s perspective on; (1) What is your definition of gifted students? (2) Do you feel teachers are generally equipped with sufficient skills in teaching gifted students? How can this be improved? Table 22 lists the recurring themes to the first question.
Table 21. Key themes from responses to the open-ended question: ‘What is your definition of gifted students?’

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 1</td>
<td>High intelligence, quick grasp of ideas and concepts than regular peers, independent learners</td>
</tr>
<tr>
<td>Teacher 2</td>
<td>Learn faster, better critical thinkers than peers, solve problem easily, learn in special topics better</td>
</tr>
<tr>
<td>Teacher 3</td>
<td>Special abilities, learn faster, smart in one or two areas, not all areas</td>
</tr>
<tr>
<td>Teacher 4</td>
<td>Can learn independently and quicker than others</td>
</tr>
<tr>
<td>Teacher 5</td>
<td>Those that can study and extend knowledge themselves, needs teachers to guide as they lack experience</td>
</tr>
</tbody>
</table>

Key Themes: Faster learners, intelligent, learn independently

Other pertinent questions that needed further refinement from the emerged findings from quantitative data are appended in Tables 22 to Tables 27.

Table 22. Key themes from responses to the open-ended question under School Leadership construct: ‘How do you think school leadership can help teachers to emerge as leaders?’

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 1</td>
<td>Encourage and support teachers, motivate them to lead. Trust and value their opinions, communication should be open and accessible. Allow teachers to time to reflect, exchange ideas, and participate; encourage input rather than forcing changes as teachers are closest to students.</td>
</tr>
</tbody>
</table>

Table 22. Key themes from responses to the open-ended question under School Leadership construct: ‘How do you think school leadership can help teachers to emerge as leaders?’ (continued)

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 2</td>
<td>Give teachers <strong>time</strong>, teachers are doing too much and eventually will suffer from a burned-out, and teaching quality is compromised. Teachers would sometimes like to go for training but the school policy does not <strong>support</strong> teachers; like we cannot leave the class to a replacement teacher. Eventually teachers don’t go for training at all. Policy is inconsistent as some teachers can attend and find replacement to teach their class, some can’t.</td>
</tr>
<tr>
<td>Teacher 3</td>
<td><strong>Support</strong> teachers in professional outreach. School leaders allow teachers to participate or collaborate with outside partners only when the academic benefit is clear. If not, school leaders just reject. However, exposure to teachers will be good, school gains reputation, teachers also gain new experience. Benefits sometimes are intangible. <strong>Time</strong> is also a factor here, teachers don’t have much time as every free hour is filled with meetings etc.</td>
</tr>
<tr>
<td>Teacher 4</td>
<td>Provide good models and leadership programs for teachers. This can help improve teachers to develop their skills. As it is, teachers don’t have much <strong>time</strong>, so not sure if this would work.</td>
</tr>
<tr>
<td>Teacher 5</td>
<td>School can help <strong>promote</strong> the development of teachers’ skills. As this school is a leader, therefore expectations are higher for the teachers. Teachers too should keep improving themselves to expand their knowledge and teaching methods, but there is the <strong>time</strong> factor. Teachers don’t have enough time.</td>
</tr>
<tr>
<td><strong>Key Themes</strong></td>
<td><strong>Time</strong>, <strong>support/promote</strong> teachers with training, and also <strong>professional outreach opportunities</strong>. Allow teachers to develop themselves, value teacher’s opinions, trust</td>
</tr>
</tbody>
</table>
Table 23. Key themes from responses to the open-ended question under Distributed Leadership construct, ‘Does the teaching and learning environment in the school facilitate students’ learning?’

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 1</td>
<td><strong>Good facilities and resources</strong> without a doubt, better than regular schools. However, the teaching and learning especially on assessments are sometimes are unrealistically too high and not according to the curriculum. We are killing the students’ motivation to learn language when our focus is on standardized examinations, and not the skills that are academically embedded in these tests. I am not saying that these tests are useless, they are very relevant, but planning on the skills to teach, should be mapped-out earlier, and not ask teachers to re-design, modify their lessons half way through the semester just to accommodate these tests. We should sit down and determine what we want at the start of the academic year and not keep changing anytime we want. I guess a better management would see this through.</td>
</tr>
<tr>
<td>Teacher 2</td>
<td>Some teachers just cannot be around because they have their own lives. So, I think this has some effects on the quality of the research produced by students. What I am happy about is that our teachers are almost all master degree holders, and that is a good school policy especially teachers for the science and math subjects. What I think should be improved is that management positions should be based on performance, not seniority.</td>
</tr>
</tbody>
</table>
Table 23. Key themes from responses to the open-ended question under Distributed Leadership construct, ‘Does the teaching and learning environment in the school facilitate students’ learning?’ (continued)

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 3</td>
<td>We have <strong>good materials available</strong> here; our activities and <strong>field trips all help to facilitate learning</strong>. We have lectures to support them where we invite outside speakers and we <strong>encourage national and overseas participation</strong>. The downside is that we give the students just too much and they <strong>don’t have time</strong> to do other stuffs or pursue their interests. I think the teaching environment here is fair, some of the <strong>management should have leadership skills and better interpersonal skills</strong></td>
</tr>
<tr>
<td>Teacher 4</td>
<td>Yes, we have very <strong>good teaching and learning equipment</strong> such as laboratories with good tools, wide range of textbooks, and journals in the resource center.</td>
</tr>
<tr>
<td>Teacher 5</td>
<td>I think the teaching and learning environment in the school is a factor that helps one learn without limitations. If a school has <strong>enough equipment</strong> and facilities, students can study by themselves, also makes them curious to know things. I think the teaching environment is fine, need to just <strong>make teachers feel happy and satisfied</strong>, otherwise their teaching is affected.</td>
</tr>
</tbody>
</table>
| **Key Themes** | **Upside:** Good facilities for teaching and learning; good networking and exposure for students  
**Downside:** Curriculum needs to be better planned, management needs to be improved in terms of leadership and school administration |
**Table 24.** Key themes from responses to the open-ended question under *Professional Learning Community* construct: ‘What is the current collaboration that exists among teachers in your department that could help in fostering a professional learning community?’

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 1</td>
<td>Almost no formal collaboration as teachers do not have much time or there is unclear policy as to who is in charge or clearly lack of leadership. If there is collaboration, it is more due to personal relationship, where we share teaching materials, ideas, talk about students etc. I think you can make time just to talk over teaching issues, exchanges etc. I remember the last time we used to have regular meetings, once every two weeks in our small group but leadership has changed. You cannot put those that do not possess leadership skills to be in charge but in our department, we do, so this is the affects we get.</td>
</tr>
<tr>
<td>Teacher 2</td>
<td>Good collaboration and I think our seating arrangement also allows for informal discussions to take place as we are seated by the subject we teach. Informally, we talk anytime, we exchange information on our techniques, get and give ideas, talk about our students etc.</td>
</tr>
<tr>
<td>Teacher 3</td>
<td>Good, teachers teaching similar subjects are seated near to each other to allow for informal discussions. We don’t have partitions, so that helps us to talk freely. We also have formal collaboration and that is during our monthly department meeting where everyone can raise any issue for discussion and sharing. I suppose this also depends on the leadership of the department.</td>
</tr>
<tr>
<td>Teacher 4</td>
<td>We have good collaboration we have the same goals (Key Performance Index) to achieve.</td>
</tr>
</tbody>
</table>
Table 24. Key themes from responses to the open-ended question under Professional Learning Community construct: ‘What is the current collaboration that exists among teachers in your department that could help in fostering a professional learning community?’ (continued)

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 5</td>
<td>My colleagues and I always discuss about lessons, teaching techniques and problems we face in the classrooms. We share everything that can improve our lesson such as power point slides, instructional media etc.</td>
</tr>
</tbody>
</table>

| Key Themes | Collaboration exists, teachers grouped and seated together enhances informal exchanges. Depends on leadership of the department as well. |

Before the researcher embarked on the two constructs under principles of learning; a second general question was asked to gauge the teachers’ opinions on the skills-set of the teachers presently teaching. The responses are listed in the Table below (Table 25).

Table 25. Key themes from responses to a general question to gauge teachers’ opinion about the overall skills that other teachers possess in their respective departments. “Do you feel teachers are generally equipped with sufficient skills in teaching gifted students? How can this be improved?”

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 1</td>
<td>In teaching gifted students? I think not all know how gifted learners think cognitively and affectively. I think this must be taught to some extent. If we are doing things right, it is more of our experience. If we are aware of how this high intelligence people think, our lessons can be better tailored to meet or ignite their skills.</td>
</tr>
</tbody>
</table>
Table 25. Key themes from responses to a general question to gauge teachers’ opinion about the overall skills that other teachers possess in their respective departments.

“Do you feel teachers are generally equipped with sufficient skills in teaching gifted students? How can this be improved?” (continued)

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 1</td>
<td>It can improved through attending trainings suited to giftedness, workshops or even going for teaching exchange with our partner schools. If we have time, I am sure we can initiate better classroom lessons.</td>
</tr>
<tr>
<td>Teacher 2</td>
<td>Some teachers are not readily knowledgeable; their knowledge can be improved through their own attitude towards self-improvement. Some teachers are not bothered. In fact there are workshops that we can attend but again, some are allowed to go and some are not. There is favoritism. We can also go and teach with our partner schools abroad, but there will be the language difficulty. One partner school actually enforced all teachers to teach in English. They struggled at first but eventually after 2 years, teachers spoke better English.</td>
</tr>
<tr>
<td>Teacher 3</td>
<td>Most teachers in my department are good in teaching, but it comes more from experience than training. However, I think teachers in this school need to have higher skills, and be creative in their teaching, and understand the best strategies that are workable for gifted students. So training, conferences would help. Lately, the school imposed active learning, but still some teachers prefer the lecture style as active learning requires more time, but we do not have much time. I would say there is a small percentage of teachers that are not fully skilled.</td>
</tr>
<tr>
<td>Teacher 4</td>
<td>I would say “no” because we need to be trained for these skills and can be done through training and workshops.</td>
</tr>
</tbody>
</table>
Table 25. Key themes from responses to a general question to gauge teachers’ opinion about the overall skills that other teachers possess in their respective departments. “Do you feel teachers are generally equipped with sufficient skills in teaching gifted students? How can this be improved?” (continued)

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 5</td>
<td>Yes, I think we got a lot of training for the gifted students but I think we need more time to prepare ourselves and to update our lessons for the gifted.</td>
</tr>
<tr>
<td>Key Themes</td>
<td>Unskilled for gifted learners, need to attend training and have time to prepare lessons better.</td>
</tr>
</tbody>
</table>

Table 26. Key themes from responses to the open-ended question under Bloom’s Taxonomy construct: ‘Are you familiar with Bloom’s Taxonomy?’ If yes, ‘how do you structure your lessons based on this taxonomy especially in the application of higher order thinking skills?'

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 1</td>
<td>Yes, I am familiar and that was when I was doing my Ph.D. and had to do an educational psychology course. Now, I have become more conscious and aware of how I can structure my lessons best to ignite these higher order thinking skills in my students. So we do a lot of skills building exercises leading to how to analyze, evaluate, and create.</td>
</tr>
<tr>
<td>Teacher 2</td>
<td>I can remember it only vaguely as I did cover it during a special short course that I took on Curriculum and Instruction. Anyway, my lessons are always getting students to analyze a problem, and then come up with their own creativity in presenting the solutions and suggestions.</td>
</tr>
</tbody>
</table>
**Table 26.** Key themes from responses to the open-ended question under Bloom’s Taxonomy construct: ‘Are you familiar with Bloom’s Taxonomy?’ If yes, ‘how do you structure your lessons based on this taxonomy especially in the application of higher order thinking skills?’ (continued)

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 3</td>
<td>I am familiar with Bloom Taxonomy and that was covered when I did my Master’s degree. My science tasks always get students to apply the higher order thinking skills, where they need to hypothesize, evaluate, analyze and create.</td>
</tr>
<tr>
<td>Teacher 4</td>
<td>Yes, I am. In my lessons especially in the laboratory, after students do experiments following the instruction, they have to analyze and explain what the results mean, and answer the questions after each activity.</td>
</tr>
<tr>
<td>Teacher 5</td>
<td>No, I am not familiar with Bloom. I think the skills in the Bloom are the skills that all teachers practice with their students. The most difficult thing is how to manage it. In my class, I want my students to have all skills (observe, analyze, evaluate, apply, create, extend). I often use questions and laboratory to practice my students.</td>
</tr>
</tbody>
</table>

**Key Themes**
Familiar, and currently practiced.

**Table 27.** Key themes from responses to the open-ended question under Problem-based Learning construct: ‘How often do you use problem-based learning techniques in your teaching?’

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 1</td>
<td>Not so often, if I do, it is for a more complex task, a big assignment. I have others like roundtable discussions, debates where students will be asked to evaluate problem and provide support and examples</td>
</tr>
</tbody>
</table>
Table 27. Key themes from responses to the open-ended question under Problem-based Learning construct: ‘How often do you use problem-based learning techniques in your teaching?’ (continued)

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 1</td>
<td>where necessary. Are those considered PBLs? I had one last semester which had to be dropped as students simply did not have the time in the level I was teaching. I may launch it again but on a smaller PBL scale. It takes a lot of planning and executing, so naturally students would take a lot of time too in thinking about the problem, and how best to answer the problem.</td>
</tr>
<tr>
<td>Teacher 2</td>
<td>All our research problems are problem-based learning. Even our class tasks get students to think critically and creatively.</td>
</tr>
<tr>
<td>Teacher 3</td>
<td>Our research projects are all problem-based and since I teach Scientific Inquiry and Nature of Science (SINOS), so we have lots of question-asking throughout the class. We don’t do so much of PBL as it takes time and students do this when they carry out their research project.</td>
</tr>
<tr>
<td>Teacher 4</td>
<td>Very rare, I have used only once for my 5 years of teaching. It was a project on oil spill. I put this problem in the SINOS class.</td>
</tr>
<tr>
<td>Teacher 5</td>
<td>I use inquiry more than PBL. Last semester, we use the hot topic, Oil spill as our PBL task. The oil spill in the Gulf of Thailand provided good practice to the students. We told them to study the effects from the oil spill to the environment, economy etc. each group of students had to choose one topic to do experiments to study the effect and solve the problem from oil spill.</td>
</tr>
</tbody>
</table>

**Key Themes**

PBL method is used but more as a complex task or in research projects.
Summary of Findings from Interview

The interview provided some insightful elaborations to some of the questionable items derived from quantitative data. The summary is as follows:

Two general questions were asked: Q1. definition on gifted and Q5. if current teachers possess skills in teaching the gifted students. These two questions were not listed as any of the items asked in the survey but were posed to the interviewees to gauge their understanding and opinion on two variables in this study that were of importance: gifted and principles of learning.

1. Definition of gifted.

All teachers shared the same consensus that gifted means individuals who possess high intelligence, are quick at learning and are independent learners compared to their peers of the same age.

2. How schools can help teachers emerge as leaders?

The teachers were vocal here and some suggestions for school leadership were to provide teachers time, support and encourage their participation in training and professional development. There was also an underlying message that school leadership should trust and value teachers’ opinions.

3. Teaching and learning environment in the school.

All teachers were full of praises for the school’s facilities such as resource center, laboratory and tools, materials and technology. However, some agreed that the management needs to be improved in terms of leadership and school administration.
4. **Collaboration.**

Generally, all four were in agreement that collaboration did exist among colleagues and there were informal and formal exchanges concerning issues of teaching and learning. Only one teacher mentioned the lack of it and pointed out that this could be due to the leadership within the department.

5. **Skills of teachers for gifted learners.**

All four teachers said that teachers should be trained in the areas of gifted. Only one teacher felt that training has already been given, but would prefer to have more time in preparation.

6. **Bloom’s Taxonomy.**

The four same teachers as above mentioned that they are aware of the taxonomy and the taxonomy is already applied in the way they conduct their lessons.

7. **Problem-based learning.**

All five teachers are familiar with this and consider PBL, a complex assignment; and only two teachers practiced PBL in their classrooms. The remaining three exerted that the school research projects are already PBL, hence students are dealt with more inquiry-based learning in science and mathematics.

**Step 3: Document analysis.**

Document analysis was the final qualitative data collection used under the sequential explanatory mixed methods design. For this study, analyses on some documents were
undertaken, specifically, to provide information on two crucial constructs under principles of learning; Bloom Taxonomy and Problem-based Learning. The researcher looked into documents that were readily available in the school such as the teachers’ assignment/class sheets, parts of lesson plan as well as completed research projects. The teachers were prompt in handing over these documents.

Table 28 below lists the evaluation that was carried out on the documents.

<table>
<thead>
<tr>
<th>Teacher 1</th>
<th>Principles of Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Document</strong></td>
<td><strong>Bloom’s Taxonomy of Learning</strong></td>
</tr>
<tr>
<td>Lesson Plan (Appendix G)</td>
<td><strong>Speaking Activity</strong> – working in groups of 4, students are asked to present a piece of news that they have just selected from newspapers by role-playing. Students are asked to write a script and deliver the news in any creative format. <strong>Lesson Objective</strong> – students will be able to summarize (analyze), rewrite a script (evaluate) and present by role-playing (create).</td>
</tr>
<tr>
<td>Class Handout (Appendix H)</td>
<td><strong>Speaking Activity</strong> – Picture Discussion: individually, students are asked to interpret and explain the situations in the picture with supporting details. <strong>Lesson Objective</strong> – students will be able to connect their background knowledge (observe/analyze) with the visual representations of what they see.</td>
</tr>
</tbody>
</table>
Table 28. Document Analysis – Teacher 1 (continued)

<table>
<thead>
<tr>
<th>Teacher 1</th>
<th>Principles of Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Document</strong></td>
<td><strong>Bloom’s Taxonomy of Learning</strong></td>
</tr>
<tr>
<td>Lesson Plan (Appendix I)</td>
<td>Students will be able to demonstrate their range of vocabulary, make relevant inferences (evaluate) and support their observations with well-developed ideas and coherent discussion (create).</td>
</tr>
<tr>
<td></td>
<td><em>Writing Activity</em> – working individually, students are introduced to graph writing.</td>
</tr>
<tr>
<td></td>
<td><em>Lesson Objective</em> – students will be able to analyze charts, graphs, etc. and use the appropriate vocabulary in their evaluation and create meaningful representations of the graphs, charts etc.</td>
</tr>
</tbody>
</table>

**Document Interpretation - Teacher 1**

Teacher 1’s usage of both principles of learning is evident from the documents; lesson plans, class handouts, and assignment sheet. The documents contain clear lesson objectives, and procedures as well as the steps on how the teacher gradually guides students from one thinking process to another higher level. The findings showed that Teacher 1 applies both the principles of learning in the classroom and this documentary evidence substantiates the data obtained from the interview.
### Table 29. Document Analysis – Teacher 2

<table>
<thead>
<tr>
<th>Teacher 2</th>
<th>Principles of Learning</th>
<th>Document</th>
<th>Problem-based Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Document</strong></td>
<td><strong>Bloom’s Taxonomy of Learning</strong></td>
<td><strong>Lab Work</strong> – “The effect of controlling substance to seed germination and seedling development”</td>
<td>Students form their own group to conduct an experiment of their choice and report the findings.</td>
</tr>
<tr>
<td><strong>Class Handout (Appendix K)</strong></td>
<td><strong>Lab Activity</strong> – working individually, students are asked to examine the growth stages of plants. <strong>Lesson Objective</strong> – Students will analyze and evaluate the various growth stages of different plants and draw (create) a diagram depicting the plant growth.</td>
<td><strong>Lab Work</strong> – “The effect of controlling substance to seed germination and seedling development”</td>
<td>Lesson Objective – Students will be able to demonstrate the use of laboratory equipment skillfully and safely, and investigate the findings using the research methodologies learned. Students will design their research procedure, measurements and report the findings.</td>
</tr>
<tr>
<td><strong>Class Handout (Appendix L)</strong></td>
<td><strong>Lab Activity</strong> – working individually, students are asked to examine, compare and contrast the distinguishing features of various types of fruits. <strong>Lesson Objective</strong> – students will be able to observe, examine, compare and contrast different features in various fruits, and confidently present a visual representation of the fruit</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Document Interpretation - Teacher 2

Teacher 2’s usage of both principles of learning is evident from the documents; class handouts, and lab work. The documents contain clear lesson objectives and procedures, and a key table containing useful information to scaffold students in their learning. To ensure students are interested and motivated in the class, Teacher 2 also introduces current news item that are
amusing and can be scientifically explained. For example, teacher 2 talked about a news article that related a villager’s experience with his jackfruit which after wrapping with certain-colored underwear, started to bear fruits. Teacher 2 described how students were fascinated with the story, and keen to prove if the colored underwear had any effects scientifically.

The findings showed that Teacher 2 applies both the principles of learning in the classroom and this documentary evidence substantiates the data obtained from the interview.

<table>
<thead>
<tr>
<th>Table 30. Document Analysis – Teacher 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher 3</strong></td>
</tr>
<tr>
<td><strong>Document</strong></td>
</tr>
<tr>
<td><strong>Class Handout (Appendix M)</strong></td>
</tr>
<tr>
<td><strong>Lesson Plan (Appendix N)</strong></td>
</tr>
<tr>
<td><strong>Lesson Activity I</strong> – working individually, students are given a series of questions to trigger their thinking about science and the natural world.</td>
</tr>
<tr>
<td><strong>Lesson Objective</strong> – students will be able to explain how scientific knowledge is produced; use scientific principles and valid criteria to classify objects and evidences; observe natural phenomena</td>
</tr>
<tr>
<td><strong>Research Project</strong></td>
</tr>
<tr>
<td><strong>Current</strong>: 5 projects</td>
</tr>
</tbody>
</table>
Table 30. Document Analysis – Teacher 3 (continued)

<table>
<thead>
<tr>
<th>Teacher 3</th>
<th>Principles of Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Document</strong></td>
<td><strong>Bloom's Taxonomy of Learning</strong></td>
</tr>
<tr>
<td>and create inquiry questions; creatively design and conduct experiments to answer the questions; use proper definition of terms and able to do a fair test by controlling the suitable experimental variables; choose appropriate apparatus and methods for collecting the experimental data; analyze and interpret the data by using the correctly statistic; and draw appropriate data-based conclusions. Solve the real world problems by attempting and integrating their various field of knowledge together</td>
<td></td>
</tr>
</tbody>
</table>

Document Interpretation - Teacher 3

Teacher 3 teaches the Scientific Inquiry and Nature of Science (SINOS) class and the nature of teaching, which is inquiry-based as evident from the class handouts on lab activity and lesson plans. The documents contain clear lesson objectives and procedures, and there are always questions guiding students’ thinking. The findings showed that Teacher 3 applies both the principles of learning in the classroom and this documentary evidence substantiates the data obtained from the interview.
### Table 31. Document Analysis – Teacher 4

<table>
<thead>
<tr>
<th>Teacher 4</th>
<th>Principles of Learning</th>
<th>Document</th>
<th>Problem-based Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assignment</strong> (Principle Techniques for Biology Research – Working in groups, students are asked to carry-out a research by reading a journal article and to extract mineral elements. <strong>Lesson Objective</strong> – Students will be able to explain (analyze), and evaluate their findings and report the meaning of their results.)</td>
<td><strong>Document</strong></td>
<td><strong>Problem-based Learning</strong></td>
<td></td>
</tr>
<tr>
<td>Plant Anatomy and Physiology (Appendix O)</td>
<td></td>
<td>Issue: Oil Spill in Thailand</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teacher gives students a recent issue on the oil spill in the Gulf of Thailand.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Students are asked to research, watch news and videos, and explain the cause and effects of the incidence and to offer their solutions to the oil spill.</td>
<td></td>
</tr>
<tr>
<td><strong>Experiment Handout</strong> (Appendix P)</td>
<td><strong>Lab Activity</strong> – working in groups, students are asked to carry out an experiment on Transpiration and Leaf surface area. <strong>Lesson Objective</strong> – students will be able to investigate the transpiration differences of upper and lower leaf surface (analyze); the transpiration differences of plants growing in shade and plants that receive direct sunlight (evaluate); and be able to understand (extend/create) the relationship between transpiration and leaf surface area.</td>
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</table>

**Document Interpretation - Teacher 4**

From the documents provided by teacher 4, it is clear that teacher 4 applies Bloom’s Taxonomy of Learning in the science lessons. This is evident from the assignment handout and lab activity. As mentioned in the interview, Teacher 4 does not assign many PBL assignments,
but the recent was on the hot issue about the oil spill in Thailand. Teacher 4 also handles the SINOS class, hence lessons are inquiry-based, as well as supervises research projects that are entirely problem-based learning in nature.

**Table 32. Document Analysis – Teacher 5**

<table>
<thead>
<tr>
<th>Teacher 5</th>
<th>Principles of Learning</th>
<th>Document</th>
<th>Problem-based Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Document</strong></td>
<td><strong>Bloom’s Taxonomy of Learning</strong></td>
<td><strong>Problem-based Learning</strong></td>
<td></td>
</tr>
</tbody>
</table>
| Lesson Plan (Appendix R) | *Motion and Movement* – Students are engaged in a brainstorming session regarding quantities related to motion. A teacher-led explanation then follows with students carrying experiments to discover the different quantities of motion. | Issue: Oil Spill in Thailand (same as Teacher 4, but focusing on a different area of specialization)
Teacher gives students a recent issue on the oil spill in the Gulf of Thailand.
Students are asked to research, watch news and videos, and explain the cause and effects of the incidence and to offer their solutions to the oil spill. |
| *Lesson Objective* – Students will be able to explain (analyze), and evaluate their findings and report the meaning of their results in a class discussion. | |

**Document Interpretation – Teacher 5**

Teacher 5, who is unfamiliar with Bloom’s Taxonomy as seen in his interview response, does apply the higher order skills in teaching students. This is evident from the lesson-plan handout on *Motion and Measurement*. Teacher 5 does not assign many PBL assignments, and the recent was on the oil spill in Thailand, where Teacher 5 team-taught with Teacher 4 in the SINOS class, but under the teacher’s specialized subject area. Besides that, like the remaining three teachers from the science subjects, Teacher 5 is currently supervising research projects that are entirely problem-based.
Summary of Findings from Documents

The findings from the document analysis revealed that these five top-performing teachers are aware of the two crucial principles of learning for gifted students. The class activities, handouts and lesson plans correlate with their interview. Four teachers acknowledged their understanding of Bloom’s Taxonomy, except for Teacher 5 who is not knowledgeable theoretically, but is practicing all the teaching strategies as advocated under Bloom’s in activating higher order thinking skills. This could also be due to Teacher 5’s educational qualification.

However, all five showed clear conceptual understanding of problem-based learning, yet the teachers mentioned that PBL can be complex as it involves students doing a lot of researching, analyzing, synthesizing, evaluating, before they can come up with creative and sound solutions. Teachers mentioned that PBLs can be time-consuming especially in a school for the gifted as students are already undergoing a rigorous and an enriched curriculum that is in accordance with the curriculum set by the Institute of the Promotion of Teaching Science and Technology. Hence, the teachers felt that the students’ research projects alone which are problem-based in nature, sufficiently addresses the question of PBL practices at Mahidol Wittayanusorn School.

Overall Findings from Research Objective Two

Three varied and sequential data collection method was carried out in response to research objective two: to identify the current teacher leadership practices that exist at Mahidol
Wittayanusorn School. The findings obtained from the three varied and sequential data collection of survey, interview and document revealed that some good teacher leadership practices were already favorably in place at this gifted school. The top three teacher leadership practices of Collaboration; Relationship and Influence; and Transformational leadership were evident from the survey, interview and document analysis. Distributed leadership remained an area where enhancement is needed especially for a more accessible communication channel between school administrators and teachers.

Based on the three sources of data collection, it was also found that many teachers practiced the two principles of learning suited for gifted learners as manifested from the teacher’s documents in substantiating their understanding of Bloom’s Taxonomy and the application of PBL in classrooms. Although initial findings from the survey revealed that teachers belonged in two extremes; that is, they were either „knowledgeable about Bloom” or „not knowledgeable about Bloom”, sequential data collection of the interview and document analyses helped allay these fears. Moreover, careful scrutiny of other individual items in support of the application of Bloom in classrooms did reveal that teachers were already practicing the taxonomy in their classrooms, although they may be unaware of it theoretically. These items; „I use questioning, role-playing, debates, brainstorming, concept maps...in my classrooms”; and „My lessons encourage the application of higher order thinking skills”; both received high mean scores over 4.0; at 4.25 and 4.03 respectively (see Table 19).
Part III: Research Objective Three

A Development of a Teacher Leadership Framework for Gifted Education in Thailand

A framework is defined as a skeletal support used as a basis for something being constructed. In educational research, there are two kinds of frameworks; conceptual framework and theoretical framework. Conceptual framework, according to Smyth (2004), is structured from a set of broad ideas and theories that guide a researcher to identify the problem under study; frame their questions and find related literature. On the other hand, theoretical framework guides the researcher to concentrate on some of the best theories that are associated with the research study. It also serves as a vantage point for the researcher in viewing the phenomena under study.

In answering research objective 3: A Development of a Teacher Leadership Framework for Gifted Education in Thailand, the researcher will attempt to develop a broad framework underlying effective teacher leadership practices, through the integration of both the study’s conceptual and theoretical frameworks. The Teacher Leadership Framework for Gifted Education will be based on the findings from this study, as well as, adhering to current literature on teacher leadership and how gifted learners learn.

The components that form the basis of the framework are intended to highlight areas that can be implemented for teacher leadership to take effective shape in gifted education. The components were derived from arduous content analysis, teacher survey, interviews, as well as document analyses.

Without a doubt, the encompassing theme to the success of this framework is school leadership; and the degree it is distributed within the school in enabling the successful
implementation of teacher leadership, and teacher-leaders to emerge. Notwithstanding, knowledge and application of the principles of learning in support of gifted education share equal importance, taking into account the core need to equip these high intellectual youths with higher order thinking skills.

According to the findings from content analysis, the following nine constructs were visibly identified as influential determinants of effective teacher leadership for gifted education.

1. School leadership & Climate
2. Distributed Leadership
3. Relationship and Influence
4. Collaboration
5. Professional Learning Community
6. Professional Development
7. Transformational Leadership
8. Bloom’s Taxonomy of Learning
9. Problem-based Learning

Based on the findings from the teacher survey, it revealed that three out of the nine effective teacher leadership constructs; collaboration, relationship and influence and transformational leadership were clearly practiced by teachers at Mahidol Wittayanusorn School. The school teachers strongly acknowledged that the spirit of collaboration between colleagues is evident, and this may be largely due to the good relationships and influence they shared with colleagues. From the survey, teachers in the school also transcended highly desirable transformational leadership capabilities, which are essential when teaching is the
largest profession, and teachers shape the minds of the future. Hargreaves and Shirley (2012) purported that, statistically, teaching has the strongest influence on student achievement, hence teachers need to come out from the shadows of the profession and take lead roles in their classrooms. Therefore, it is encouraging seeing teachers at the school taking steps to be leaders in their classrooms by introducing new initiatives to keep their students motivated, rather than waiting for instructions from the principal or the department head.

Some other effective teacher leadership constructs were also fairly present at Mahidol Wittayanusorn School; and they include School leadership and Climate, Bloom’s Taxonomy and Problem-based Learning. Teachers were generally appreciative of the school leadership and climate. The findings also revealed that teachers were already practicing Bloom’s Taxonomy in their classrooms, despite some, not knowing it theoretically. Similarly, teachers revealed that the application of Problem-based Learning was not widespread as all students have to complete at least one research project during the three years of their studies, which is already problem-based in nature. Most teachers incorporated inquiry-based learning method in the classrooms, which is another effective principle of learning, advocated by scholars that works best especially for science subjects.

Two other constructs that scored moderately by teachers were on opportunities for professional development and professional learning community. Time was the most often cited reason hindering teachers to grow professionally. The sequential data collection that followed after the survey; where an interview was conducted with teachers, further reinforced the issue of time as an impediment to professional development. Teachers interviewed felt that though they were in agreement with the policy of „at least 90-hours of professional development per year‟, there are however obstacles in the implementation of the policy. Teachers felt that the
school need to free teachers” time more so that professional courses for self-improvement can be undertaken, as well as some reflection time on teaching practices.

Despite not having any of the nine constructs scoring mean scores lower than 2.50, one construct - distributed leadership was ranked the lowest out of the nine constructs. The item highlights to some extent, a need for the school to inculcate a more inclusive culture of shared leadership, where leadership is distributed flatter to teachers, so that teacher-leaders can emerge. One item under distributed leadership that scored the lowest out of the 50 items asked was the need for the school to improve on its communication channel between administrators and teachers (M=2.61). Leithwood and Riehl (2003) explained that “leaders act through and with other people. Leaders do things, through words or actions, that have a direct effect on the primary goals of the collective, but more often their agencies consists of influencing the thoughts and actions of other persons and establishing policies that enable others to be effective.” For school improvement to take effect in the 21st century, school leaders’ roles have shifted from a single individual to a team of individuals (Marzano, Waters and McNulty, 2005), hence by distributing leadership roles to a purposive community of teachers, can lead to a better predictor of success in schools (Goddard, Hoy and Hoy, 2004), as the shared beliefs can translate to enhance the effectiveness of the institution.

Proposed Framework

The proposed framework to address the phenomena under study is composed of nine constructs that were all ranked from moderate to very high, and more importantly, above the mean score of 2.50. This shows that at Mahidol Wittayanusorn School, the country’s national
high school for the gifted, teacher leadership practices are already favorably in placed. Although by no means an exhaustive framework, design efforts were made to best represent the components that were identified and supported by literatures, and later manifested in the findings from the survey, interview and document analyses.

The primary purpose of this framework is to provide new knowledge to the existing body of knowledge on teacher leadership for not only gifted education in Thailand, but general education as well. It is hoped that the framework will create awareness among school leaders and teachers that the 21st century school leadership calls for more concerted effort and partnership from both teachers and administrators in leading school change. More importantly, the call is stronger for teachers to emerge as leaders and agents of change rather than mere representatives of change. Studies have shown that learners learn best from teachers that model themselves as active learners. The five constructs under teacher leadership will therefore serve teachers as a valuable guideline for them to realize their potential leadership skills; relationship and influence, collaboration, professional learning community, professional development and transformational leadership. Also, teachers must at least have an understanding on the two principles of learning; Bloom’s Taxonomy and Problem-based learning, which have proven to be effective in activating student learning in order to be able to apply good instructional practices in classrooms.

Figure 5 represents the output of this study. This preliminary framework will be evaluated by a group of experts from the field of gifted education. The experts will examine the operational suitability and feasibility of the proposed framework.
Application of the Framework

There are three major areas (outer ring) under the proposed framework, as indicated alphabetically as (A) School Leadership, (B) Teacher Leadership (C) Principles of Learning. School leadership refers to leadership that belongs in the hands of administrators. Teacher leadership literally means leadership demonstrated by teachers. Principles of learning are two
fundamental teaching principles that have been advocated to work best with all students; especially if applied with gifted students.

The framework as earlier defined; forms a skeletal support in pursuit of the ultimate goal – to attain “The Teacher Leadership for Gifted Education” (as indicated in the triangle). Within these three areas located in the outer ring, there are nine crucial constructs located in the inner ring which must be addressed. There is no pre-set directional start point for this framework, despite the preconceived belief that school leadership should lead the way in leading school change. Moreover, the researcher believes that the interactions between the three major areas are intertwined and revolving; and initiatives need not necessary come from top-down, rather a dyadic-directional relationship. The discussions that follow suit will highlight each construct’s functionality, and their proposed implementation under their respective areas.

(A) School leadership.

School leadership refers to the type of leadership displayed by the school administrators or principals who lead and manage the school.

1. school leadership & climate.

function.

School leadership is defined as the type of leadership displayed by the school principals or administrators who lead and manage the school. Under school leadership, the school’s climate is the characterization of the internal climate of the school that encompasses school’s atmosphere, tone, the personality or ethos of the school (Green, 2010). Both constructs; Leadership and Climate, located in the inner circle, serves
crucial functions as they essentially dictate the responses and actions of followers in the school; in this case, teachers.

At Mahidol Wittayanusorn School, this construct is perceived good by teachers but there is definite room for enhancement (M=3.68). Therefore, in order for teacher leadership to permeate in schools, school leaders must lead the way in improving the school’s leadership style and climate to one which is positively encouraging and supportive.

**implications.**

1) School leaders should ensure first and foremost that the school’s goals have been defined and communicated to all teachers. This can be done through teacher orientation, the dissemination of school’s publications, at school meetings etc.

2) Subsequently, school leaders must ensure that the curriculum has been designed to cater and challenge the gifted learners, and are achievable by students. School leaders and teachers can work concertedly in determining the best curriculum that will challenge the intellectual abilities of the students. Joint-participation from external curriculum specialists would also ensure that the curriculum meets the academic skills as well as the technical and scientific know-hows of industries.

3) School leaders must ensure that the school climate is supportive and encouraging so as to facilitate the emergence of teacher-leaders. This can be achieved by empowering teachers to have a voice in the improvements that would lead to higher student achievement.
2. distributed leadership.

function.

The second construct, Distributed Leadership, reinforces the fact that leadership in the 21st century is no longer hierarchical. At the core of this leadership is the engagement of many people in a leadership activity, hence leadership is dispersed or distributed (Hopkins and Jackson, 2003). There have been many studies within the teacher leadership literature that manifested the positive effect of distributed leadership on teachers’ self-efficacy and morale (Macbeath 1998, Crowther et al., 2000). Evidence from these studies suggested that where teachers share their practices and learn together, the potential of achieving better teaching quality is increased.

Although, distributed leadership has been perceived as moderately permeating at the school, it did not score as impressively when compared with the other eight constructs. Distributed leadership scored moderately at M=3.16, which reinforces the need for administrators at the gifted school to inculcate a stronger culture of shared leadership with teachers.

implications.

1) School leadership must re-conceptualize leadership practices in the 21st century as only through the application of distributed leadership can capacity building unleash the leadership potential in individuals, subsequently, teacher leaders can emerge. Gronn (2000) coined this “an emergent property of a group or network of individuals in which
group members pool their expertise” as means of generating and sustaining school improvement.

2) School leaders and teachers need to form a partnership and work as a team. Distributed leadership which focuses on the creation of a synergy of expertise within individuals of a school, rather than a single energy from one individual, means teachers are involved in decision-making processes concerning school improvements. School leaders can initiate task-force teams comprising teachers to lead on some of the improvement projects of the school.

3) When leadership is distributed, teachers and administrators will share open-communication with one another, and teachers will feel comfortable to freely express their opinions towards school improvements and student learning.

(B) Teacher leaders.

Teacher leaders are teachers who assume formally or informally, one or more of a wider array of leadership roles to support school and student success. Teacher leaders model continual improvement, model lifelong learning, and use what they learn to help students achieve success (Harrison & Killion, 2007). While teacher leadership is a process by which teachers, individually or collectively; influence their colleagues, principals, and other members of the school community to improve teaching and learning practices with the aim of increased student learning and achievement (York-Barr & Duke, 2004). There are a total of five constructs under the stewardship of teacher leaders.
3. relationship and influence.

function.

This construct is psychologically-related to social behavior; and how social behavior is goal-oriented. The relationships we establish with others serve our goals; such as the need for social ties and the desire to understand ourselves and others. It also fulfills our need to gain or maintain status and to make friends.

At Mahidol Wittayanusorn School, this positive social characteristic is already practiced by teachers. Teachers at the school have strong collegial relationship with their colleagues.

implications.

1) Schools should encourage teachers to forge good relationships with each other, by arranging team-building exercises, off-sites meetings etc.

2) School teachers should also be respectful of the differences in beliefs and values of their colleagues so that collegiality can take place. In schools where there are both local and foreign teachers, it is highly recommended if teachers undergo some kind of culture orientation.

3) Teachers should be attentive listeners; and be more than willing to assist their fellow colleagues in non-teaching related issues.

Research on school improvement have consistently attributed the effects collegial relationships have on school improvement and change, as Little (1990) pointed
out, collegial interaction lays the groundwork for developing ideas, and exchanges between teachers.

4. collaboration.

function.

Harris and Muijs (2002) postulated that collaboration is at the heart of teacher leadership, as it is premised upon change that is enacted collectively. Collaborative acts see the pooling of teachers’ knowledge, expertise and capacities. It allows unlimited opportunities to learn from one other, ultimately, resulting in multiplication effects in classrooms.

At Mahidol Wittayanusorn School, collaborative spirit is perceived the strongest of the nine constructs (M=4.12), as indicated from the teacher survey. Research has also suggested that through collaboration, teacher leaders can help other teachers to embrace teaching and learning goals and to work towards improvement (Leithwood and Reil, 2003).

implications.

1) Schools should encourage the culture of collaboration among teachers. Through collaboration, teachers are afforded opportunities to work cohesively and collectively. Teachers can discuss new ideas, craft innovative instructional strategies with colleagues, share common class materials, discuss problems etc. with the fellow teachers, within their department or with teachers from other departments.
2) The culture of collaboration would also lead to mutual trust and respect among colleagues. Once trust and respect are in place, teachers will view classroom observations as non-threatening.

5. professional learning community (PLC).

function.

PLC occurs when an entire group of professionals in a school comes together to learn from each other, within a supportive, self-created community (Morrissey, 2004). To create such collective efficacy is dependent on the school leader, or the administrators.

Mahidol Wittayanusorn School should champion the power of collective cohesiveness, so that the school can experience substantive increase in its organizational growth (Marzano, Waters and McNulty, 2005). Currently, the school scores a mean score of 3.38; ranked 7th out of the nine constructs.

implications.

1) To encourage school teachers to be more opened to changes, and embrace the fact that successful contribution to student learning is no longer a function of an individual’s effort but the collective efforts of all. (Dufour, 1998, 2004; Sergiovanni, 2004). This can be achieved through formalizing time for teachers to engage in talks, discussions with their colleagues in a non-threatening environment, such as teacher’s lounge, cafeteria etc.
2) School teachers should make more attempts to interact with teachers from other departments, ultimately, working collaboratively, and learning from teachers from the outside community.

3) School teachers should also try to be actively engaged in discussions, to have time to reflect on one’s own teaching practices, and to share new teaching ideas anytime; informally and formally. In monitoring one’s own self-efficacy, teachers should be receptive to feedback and comments from colleagues.

4) The school should encourage teachers to set aside more time for reflection on their teaching practices with their colleagues.

6. **Professional development.**

   **function.**

Professional Development is a comprehensive, sustained, and intensive approach to improving teachers’ effectiveness in raising student achievement. Besides that, professional development also underpins the lifelong learning philosophy.

This construct was one of the lower ranked constructs, third to Distributed Leadership and Professional Learning Community. Teachers at Mahidol Wittayanusorn have indicated that time and financial assistance was often obstacles to them developing professionally.

Some of the world’s best performing schools such as Finland and Singapore are strong advocates of Teach Less, Learn More (TLLM). Teachers in Finland teach 40% less than teachers in the United States, with plenty of time to prepare daily lesson plans, one-on-one meetings with students, and collaboration with colleagues and marking
(Sahlberg, 2011). In Singapore, this national policy has reaped promising results as the country is now ranked in the top three of the recent PISA 2012 results on high school students’ performances in Mathematics, Science and Reading. Teachers in Singapore have more time to engage in polishing their skills in lesson planning, and have time to find ways to engage students productively and artistically, as well as how to differentiate instructions effectively etc.

**implications.**

1) Schools should ensure that teachers are supported with on-going training as per the applicable training policy allowed to teachers. To ensure the effectiveness of training, schools can make training as one of the measureable KPIs (key performance indicators of teachers.)

2) Schools should free teachers’ time to allow for self-development to take place.

7. **transformational leadership.**

**function.**

Transformational leadership, as Bass (1985) contended, is leadership that impacts followers by (a) raising followers level of consciousness about the importance and value of specified and idealized goals; (b) by getting followers to transcend their own self-interest for the sake of the team or organization, and c) by moving followers to address higher-level needs.

At Mahidol Wittayanusorn School, transformational leadership is evident in classrooms, scoring relatively high especially in areas such as the teacher’s individual
interaction with students; integrating moral and ethics in lessons, communicating learning goals and motivating students towards them, as well as the search and introduction of new teaching methods to continuously engage students to achieve successful learning. This is parallel to a study conducted by Fenner, Mansour and Sydor (2010), where they found that students’ motivation level increased with teachers’ good instructional designs.

Two aspects of improvements are first; teachers need to engage in better class management such as to not ignore disruptive acts from individual students, like sleeping in class, playing with the mobiles or laptops while teachers are teaching. Teachers are often tolerant to these acts of misbehaving as students in this school undergo rigorous learning schedule.

Second; teachers need to interact more with students outside classroom hours so that they become familiar with students as individuals, understand them affectively; such as their career aspirations, their family background, their interests etc., as students in this school live in as boarders. In a study conducted by Gehlbach et al, (2011), the group found that teacher’s caring attitude has a direct effect on students’ academic self-efficacy and intrinsic value of education.

**implications.**

1) Teacher should assume transformational leadership roles in their classrooms as research on effective general education and special education teachers has evidently pointed out that what teachers do in the classroom affect student achievement gains. (Brownell et al., 2008)
2) Teachers should communicate learning goals to students and find ways to motivate students towards the goals.

3) Teachers should be highly initiative to seek out new instructional methods so as to continuously engage the minds of this high ability group of learners.

4) Teachers should try to engage in fostering more teacher-student relationship not only during class hours but beyond classroom hours.

(B) Principles of learning.

8. Bloom’s Taxonomy of cognitive domain function.

Bloom’s Taxonomy refers to the classification of the goals in education regarding the development of intelligence. In the cognitive domain, there are six levels of thinking classification, and one that a gifted school should emphasize is the higher order thinking skills (analyze, evaluate and create).

At Mahidol Wittayanusorn School, teachers have been found to belong in extreme ends; either possessing an understanding or do not possess an understanding of Bloom. However, further investigation revealed that most teachers do practice a student-centered teaching approach as well as active learning. Therefore, despite the setback of not having a theoretical knowledge, teachers at the school to some extent are applying their lessons according to Bloom Taxonomy. However, it is recommended that school administrators set a high priority in equipping teachers with the necessary skills as the teaching and learning of the gifted students involve a higher set of teaching skills from
teachers. From the survey, only 34% acknowledged that they have had some training on gifted education.

**implications.**

1) Teachers should be aware of how humans process their thinking; therefore an understanding of Bloom”s Taxonomy will provide teachers will the necessary pedagogical knowledge on how to approach logical thinking from lower to higher levels. School leaders should make arrangement for teachers to be trained in gifted programs. This is applicable for both science and non-science teachers.

2) Teachers with understanding of Bloom”s taxonomy can consciously plan their lessons; and in a gifted education, teachers will be able to execute the appropriate instructional strategies to guide the gifted students” thinking and skillfully take them up the taxonomy of higher order thinking skills.

9. problem-based learning (PBL).

**function.**

PBL is an instructional, student-centered strategy in which groups of students are confronted with real problems to solve. Constructivist in nature, the main goals of PBL is for students to identify information gaps and to seek and organize new information on account of the described problem. PBL”s strengths among others are the fostering of autonomous learning and personal responsibility, which has been advocated in past literature as highly suitable for gifted students.
At Mahidol Wittayanusorn School, teachers scored this principle of learning fairly good; however, from the responses of the top-performing teachers’ interviews, all teachers admitted to the complexity of initiating one as students are already engaged in one PBL project which is their research projects. However, on occasions, teachers do attempt to provide students with PBL opportunities, as indicated by Teacher 1 who is from a non-science subject, and only on rare occasions does Teacher 4 assigns PBL. Teacher 4 and the remaining three teachers from science subjects are active practitioners of inquiry-based learning, which is also one of the advocated principles of learning for gifted students, especially in the field of science and mathematics. In comparison to PBLs, inquiry-based learning provides students the opportunity to explore questions meaningfully through investigation and collaboration (Thomas, 2003; Jou, Chuang and Wu, 2010). Similar, to PBL, inquiry-based approach enables students to construct their own knowledge through active participation in learning and interaction with the environment. Both approaches see the teacher as the facilitator. (Meng and Yang, 2003; Jou et al, 2010).

**Implications.**

1) Teachers should introduce authentic issues and problems to students to allow for advanced thinking to take place so as these gifted students can demonstrate their full potential in critical analyses and evaluation, and creative solutions.

2) Teachers should encourage students to work in peer-groups to facilitate advanced research and cooperation among students, as well as to allow students to undertake independent study in investigating the problem at hand. According to Yelland, Cope, &
Kalantzis (2008); Etherington, (2011), PBL leads to an enhancement in students’ reflective, communicative and collaborative skills as each student brings different views and reflections.

3) Teachers should allow time for PBL tasks especially for gifted students as the designs of PBL facilitates self-directed learning, and collaboration; hence are ideal learning skills suited for the gifted. In a study done by Hoy and Hoy (2009), the researchers revealed that in PBL, students get the opportunity to learn independently, as well as cooperatively, and use their new found knowledge to solve the problem at hand.

**Framework Validation by Experts**

In order to ascertain the operational viability of using the framework for gifted education in Thailand, not specifically to Mahidol Wittayanusorn School; a proposed preliminary framework of “A Development of a Teacher Leadership for Gifted Education in Thailand” was brought to the attention of five leading educational experts in the field of gifted education. As these experts hold high positions in their respective organizations, a validation on the framework was carried out through email, with the researcher making herself available to the experts for any one-on-one clarifications. The preliminary framework was attached, and was accompanied by literature regarding the function and discussion of the application of the framework.

The selection of the five experts was crucial in the research as the area understudy – “gifted education” is thin. The experts chosen were prominent Thai educators with solid experience in gifted education. Table 33 lists the profiles of the experts:
**Table 33. Experts Profile for Framework Validation**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position/ Affiliation to MWITS</th>
<th>Gifted Education Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Thongchai Chewpreecha</td>
<td>Director of Rayong Science Academy (RASA), a PTT sponsored high school for the gifted in science and mathematics. <em>Former principal of Mahidol Wittayanusorn School, Former President of the Institute of Promotion of Science and Technology, Thailand.</em></td>
<td>More than 30 years</td>
</tr>
<tr>
<td>Professor Dr. Narong Punnim</td>
<td>Advisor to the Mathematics Department, Mahidol Wittayanusorn School, Advisor to the Department of Mathematics, RASA, a PTT sponsored high school for the gifted in science and mathematics.</td>
<td>More than 25 years</td>
</tr>
<tr>
<td>Aj. Vachiravan Bunnag</td>
<td>Head of Thai Department, Mahidol University International Demonstration School. <em>Former Assistant Principal, Mahidol Wittayanusorn School</em></td>
<td>22 years</td>
</tr>
<tr>
<td>Dr. Sumalee Waiyarod</td>
<td>Post-doctoral Research Fellow, Harvard University and Lecturer at Mahidol University, Faculty of Department of Education, Educational Management International Program. <em>Former Physics Teacher at Mahidol Wittayanusorn School</em></td>
<td>5 years</td>
</tr>
<tr>
<td>Dr. Washirasorn Saengsuwan</td>
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Recommendations from the experts were positive as to the feasibility and operational suitability of the suggested framework. Two experts requested a face-to-face meeting, and discussed some of the terms used in the preliminary framework. The researcher accepted the comments made which was to change the wording of the two of the outer circle areas; namely „School leadership” to „School leaders” and „Teacher Leadership” to „Teacher leaders”, while no change was made to „Principles of Learning". The expert also recommended that the researcher maintains consistency in some of the words that were used to refer to the nine constructs. One other point made by another expert was concerning the use of „Relationship and influence” in one of the constructs under Teacher Leaders. The expert felt that the word „influence” may have different connotative meaning for some; especially if it is associated with power, which may sometimes be construed negatively. The expert suggested considering adding the adjective „positive” to mean „positive influence” which can easily be interpreted as teachers that exude good interpersonal skills may have positive influence on other teachers. The remaining three experts were agreeable with the framework and made no comments.

All the suggestions of the two members of the expert team were taken into consideration and changes were made in refining the framework. Other than the above suggestions, the five experts were in agreement with the nine constructs that could pave way for teachers to assume leadership roles in leading school change. The revised framework can be seen in Figure 6.
Figure 6 is the final framework on “Effective Teacher Leadership” for gifted education in Thailand, that were consensually validated by five leading experts from the field of gifted education. The framework design was based on the findings derived from the study that was conducted in Thailand’s one and only national high school for the gifted, thus, to some extent could serve as a reliable framework on effective teacher leadership for other gifted schools/programs in Thailand.
The framework comprises two rings; outer and inner rings that encapsulate a triangle. The outer ring represents the three major areas of concerned of the study, while the inner circle represents the constructs that would lead to effective teacher leadership practices, as represented in the big triangle. The framework is revolving with all three areas having equal importance, hence there is no particular start point as each area of the outer ring share a dyadic relationship with one another.

The outer ring is represented by (A) School Leaders, (B) Teacher Leaders and (C) Principle of Learning. Under (A) School leaders, there are two constructs; School leadership and climate; and Distributed Leadership. Under (B) Teacher leaders, there are six constructs that are said to promote and enhance teacher leadership. The six are Relationship & Positive Influence; Promoting Collaboration; Professional Learning Community, Professional Development; and Transformational Leadership. Under (C) Principles of Learning, there are two constructs that are said to have a good effect on gifted learners’ learning; Bloom’s Taxonomy and Problem-based Learning. When combined together, all the constructs under the three main areas of importance would lead to an effective teacher leadership practices in the school, as indicated by the triangle in the center.

The first area of importance concerns school leaders as indicated by (A). School leaders comprise two constructs related to the school and its climate. The first construct (1), is school leadership and climate. School leadership and climate involve ensuring that the school goals have been defined and communicated to all teachers; that the curriculum has been designed to challenge the gifted students, and are achievable; and that school leaders and teachers are working cohesively as a team and are in good partnership in leading school change. The second construct, Distributed leadership (2) involves teachers in decision making processes with
regards to school improvement, student learning and curriculum planning. It also involves the administrators and teachers sharing open communication and teachers are able to freely discuss their opinions towards school improvement and student learning; and that the teaching and learning environment is satisfactory.

The second area of importance is (B) and concerns teacher leaders. There are six constructs altogether. The first construct under teacher leaders is indicated under (4) relationship and positive influence. This involves teachers finding time to exchange ideas and reflect with colleagues on teaching practices; see teachers being persuasive and having positive influence on their colleagues; that teachers are attentive to their colleagues when they talk about their teaching experiences; teachers giving advice to their colleagues when they feel the idea is inappropriate; that teachers try to initiate new ideas and methods with their colleagues to improve teaching; that they are happy to assist their colleagues even in non-teaching related matters; and are respectful to their colleagues’ different beliefs and values. The second construct indicated as (5) is promoting collaboration. This involves teachers sharing teaching materials and strategies with fellow teachers; are able to seek help when the need arises for good and creative teaching ideas from colleagues; are comfortable having their class observed; are receptive to feedback and help from colleagues; and that there is a climate of trust and respect; and that collaboration is not only within the department but stretches beyond the department to other departments in the school. The third construct indicated as (6) is Professional Learning Community. This involves teachers in the school sharing good relationship with each other; that they actively participate in discussions regarding improvements in teaching through available channels such as social network, discussion forums etc.; teachers having regular scheduled time for reflection and discussions on teaching
practices; that teachers are active in sharing new ideas gained from reading, attending workshops; that teachers share instructional techniques and strategies in both informal and formal setting; and that teachers are receptive to critical feedback and comments for improvement. The fourth construct indicated as (7) is Professional Development. This involves teachers being supported with training needs; there are good professional resources, materials, and technology available; there is allotted time for teachers to develop professionally; the school frees time for teachers to develop; there is available financial assistance for individual development; and teachers themselves, are seekers of new knowledge to improve their professional skills. The last construct that concerns teachers, indicated as (6) is transformational leadership. This construct involves teachers taking effort to have small conversations with students, before and after class; there is integration of moral and ethics in lessons; that the learning goals are communicated to students and they are motivated to reach the goals; taking time to get to know students better, beyond class work so as to understand their interest, career aspiration, family background etc.; teachers talking to disruptive students and to find ways to assist the student; and that teachers to continuously use new and innovative instructional methods to engage their students.

The final area in the outer ring which is of importance to gifted education is the Principles of Learning as indicated by (C). There are two principles; Bloom’s Taxonomy and Problem-based Learning. Bloom’s Taxonomy as indicated by (7) involves teachers having the understanding of the taxonomy from their professional or teacher training; that teachers are aware of the various levels of thinking under Bloom and can consciously plan their lessons to gradually take students up the taxonomy levels; that inductive approaches are used more than deductive in guiding gifted students’ thinking, that teachers encourage the application of higher
order thinking skills in their gifted student, that the use of varied teaching strategies are used with gifted students; questioning, role-playing, brainstorming, concept-maps, inquiry learning etc.; and that assessments are used to improve students” higher order thinking skills. The ninth construct; Problem-based learning (9) involves teachers using effective questioning before class and throughout class; that significant real-life issues and authentic problems are introduced to students to solve; that students work in their peer-groups than individually; that teachers assign at least one complex PBL task to students; that teachers attempt to create new teaching strategies with other teachers; and finally, that teachers apply more open-ended type of questions in assessments to measure students” level of creativity and problem-solving skills.

When all the nine constructs are functioning, teacher leaders will emerge, consequently, leading to effective teacher leadership.

**Summary of Findings**

The findings of the research revealed crucial practices that must be implemented and promoted in order to facilitate and enhance effective teacher leadership in gifted education in Thailand. The research findings are presented according to the three research objectives as follows:

For research objective 1: to identify the effective teacher leadership for gifted education, a content analysis was undertaken. The researcher found three major areas comprising nine recurring themes. The three key areas are School leaders, Teacher leaders, and Principles of Learning. Under these areas, there are a total of nine constructs: (1) school leadership and
climate (2) distributed leadership (3) relationship and positive influence, (4) promoting collaboration, (5) professional learning community (6) professional development, (7) transformational leadership, (8) Bloom’s Taxonomy, (9) problem-based learning. The identified areas and their respective constructs were then used to design the research instrument „Teacher Leadership for Gifted Education Survey”. The instrument was validated for its item congruence by five experts from the field of gifted education. The selection of the experts were intentional so as they represent well the three major areas that emerged from the content analysis. The first area: „School leaders” was represented by two leading experts who were previous administrators of the gifted high school; „teacher leaders” was represented by two former science teachers of gifted education, and a gifted specialist with educational psychology background and a specialist in teacher education represented „Principles of learning”.

In studying research objective 2, to identify the current teacher leadership practices in gifted education in Thailand, the researcher chose to undertake a sequential mixed method design whereby the most popular research method was used: the explanatory mixed method design. In this study, three steps were undertaken in data collection; the quantitative data was launched first, followed with the qualitative data collection of interview. The final step was analyses on documents. The qualitative method was used to refine and confirm some pertinent issues that needed refinement from the quantitative findings.

The survey revealed that overall the school has a relatively good structure of teacher leadership in place, with strong consistencies in some of the identified constructs that would lead to effective teacher leadership. Teachers at the school under study demonstrated high individual-efficacies in collaboration; relationship and influence; and transformational leadership. The researcher can conclude that teachers at the school generally share and forge
good relationships with their teaching-peers, have a high level of collaboration with each other concerning teaching and learning, and are already leaders in their respective classrooms. All the three constructs above scored high mean scores of 4.12, 3.99 and 3.88 respectively out of a 5-point Likert scale of measurement. Medium consistencies were found in school leadership and climate (M=3.68); Bloom’s Taxonomy (M=3.61); problem-based learning (M=3.61); and professional development (M=3.57). The two constructs that were ranked 8th and 9th are professional learning community (M=3.38) and distributed leadership (M=3.15). Note that the two constructs were not termed „low“ or „weak” by the researcher as the mean scores were all still much above the mid mean of 2.50 of a 5-point Likert scale. However, these were areas that needed further scrutiny or enhancement so that Mahidol Wittayanusorn School can exemplify the effective teacher leadership practices for others to emulate; both for gifted programs as well as for general education practitioners.

Subsequent to the step 1- survey revelations, two sequential steps under qualitative data collection were executed. The researcher held step 2 - one-on one interviews using the purposive sampling, where 24 random Grade 12 (equivalent to Mathayom 6) students were asked to nominate their top-performing teachers in science, math and English. The researcher defined top-performing teachers as teachers that possessed good instructional strategies, excel in all aspects of teaching and learning. Six teachers were initially nominated, but interviews were conducted with only five teachers as the sixth teacher was unavailable during the week the interviews were scheduled. The interview focused on some outstanding findings from the quantitative data. The interviews provided some insightful elaborations to the investigated items. There were some interesting trends that resulted from the interview. Two complimentary components were that teachers were all highly satisfied with the teaching and learning facilities
of the school; especially the availability of extensive resources, teaching and learning tools, especially the experimental tools, technology, and the network with external alliances. The other component was the spirit of collaboration that permeated among the school teachers. The inquiry on the two principles of learning also confirmed that though some teachers were unaware of Bloom’s taxonomy theoretically, they did apply appropriate instructional strategies that incorporated the activation of Bloom’s thinking classifications in their lessons, especially the higher order thinking skills suitable for gifted students. One compelling observation was that four out of the five top-performing teachers were knowledgeable about Bloom’s Taxonomy and problem-based learning.

On the other hand, some components received only moderate response. All teachers were vocal with their thoughts on how school leadership can support the emergent of teacher leaders. The teachers consensually suggested three factors; giving teacher more time, value their opinions and to have more trust in teachers, and increased participation in professional development courses. The other less enthusiastic response was about the present school teachers’ skills in teaching gifted learners. Ironically, the same four teachers that were knowledgeable about Bloom’s Taxonomy were in agreement that teaching gifted students needed special skills that can be obtained from specific courses.

Step 3 and the final stage of the qualitative data saw the researcher analyzing school documents such as lesson plans, activity sheets, and assignment handouts. Document analysis was carried out to ascertain the extent of how Bloom’s Taxonomy and Problem-based learning were practiced and applied in classrooms. The analysis revealed strong presence of the features advocated under Bloom as good strategies in activating higher order thinking skills. The documents also provided detailed explanation and steps of classroom activities. The evidence
on other documents also manifests that problem-based learning tasks are implemented by the school teachers. One huge PBL task is the research projects that the gifted students undertake in order to graduate from the school.

For research objective 3: to develop an effective teacher leadership framework for gifted education in Thailand, saw the researcher consolidating the findings obtained from both quantitative and qualitative data (research objective 1 & 2) to come up with the framework design. The framework was based on the three major areas and their respective nine constructs that were said to promote teacher leadership in gifted education. The three key areas were school leaders, teacher leaders and principles of learning. Under school leaders, there were two prominent constructs of equal importance; Construct (I) school leadership and climate, and (II) distributed leadership. Under school leadership and climate, the school goals must be defined and communicated to all teachers. The curriculum goals must also be achievable by the students and it is essential that the school encourage teachers to emerge as leaders in order to achieve pedagogical excellence in the school. Distributed leadership indicated the priority for administrators and teachers to work cohesively and in partnership, and this includes participation of teachers in decision making concerning teaching and learning, as well as to uphold open communication to enable teachers to be able to express their opinions freely. The five subsequent constructs are related to teachers. They are (III) relationship and positive influence, (IV) collaboration, (V) professional learning community, (VI) professional development, and (VII) transformational leadership. These constructs involve individual efficacy in developing interpersonal skills as well as professional growth and exchange. The final two constructs (VIII) Bloom”s Taxonomy and (IX) Problem-based Learning are advocated as the two most important principles of learning that are best suited for gifted learners. There is
no pre-set direction for this framework. The framework works like a wheel where the relationships between these three areas are intertwined, revolving and dyadic. Ideally, in the 21st century, the role of leadership no longer lies with an individual but collectively.
CHAPTER V

CONCLUSION, DISCUSSION, AND RECOMMENDATIONS

The purpose of this study was to develop an effective teacher leadership framework for gifted education in Thailand. The framework design was based on the findings from both quantitative and qualitative data collection. The researcher applied the most popular mixed method strategy - the explanatory mixed method design strategy, whereby the data collection strategies were conducted in sequence. Four types of data collection were carried out: a content analysis, survey, interview, and document analysis.

The primary intention of this framework is to create awareness among school leaders and teachers that the 21st century school leadership involves collective participation from both teachers and school administrators in leading school change. Furthermore, teachers need to come out from their shadows and take leadership roles in order to achieve higher student achievement. Ultimately, it is the intention of the researcher that this framework serves as a feasible guideline that can be operationally implemented in other gifted schools or even regular schools in Thailand.

The research was conducted in January 2014 in three steps. In step 1, surveys were distributed to all 83 teachers employed in the school. The surveys were hand-delivered to those that were in school, and some were emailed to teachers that were pursuing their higher studies locally and overseas. A total of 77 surveys were collected at a return rate of 93%. This was then followed by step 2, whereby individual interviews with five top-performing teachers nominated by students. Step 3 saw the final procedure of data collection carried out. An
The research was driven by three research objectives as follows:

1. To identify the effective teacher leadership for gifted education.
2. To identify the current teacher leadership practices that exist in gifted education in Thailand.
3. To develop an effective teacher leadership framework for gifted education in Thailand.

The data collection addressing the research objectives was carried out quantitatively and qualitatively. The research procedures comprised three parts; Part 1 saw a content analysis carried out in response to research objective one. Part 2 saw a systematic and sequential data collection strategy involving a 3-step data collection, combining both quantitative and qualitative methods, where the findings of one method inform the other. First step in sequence was the administration of a survey. This was then followed with step 2 and step 3; a qualitative data collection comprising interview and document analysis. Part 3 saw the researcher addressing research objective three with a development of an effective teacher leadership framework.

**Conclusion**

The main intention of this research was to provide some form of knowledge to administrators and teachers concerning the importance of teacher leadership and its effect to students’ achievement. Teachers in gifted education especially, need to assume ownership of their profession and be leaders in their classrooms. As Harris and Muijs (2005) stressed, teacher
professionalism and expanded leadership roles serve students best as teachers are the closest to classrooms, and therefore are key change agents that can implement changes that make a difference to learning and learners.

The framework on the effective teacher leadership for gifted education is therefore based on the findings of this study. A content analysis, survey, one-on-one interview, and document analysis were executed. The first priority in the research journey involved an arduous content analysis in search of the recurring themes under teacher leadership and gifted education. These themes would later form the effective teacher leadership practices for gifted education. This was then followed closely by the design of the research instrument. A survey was then launched and the findings analyzed so that the following sequential steps in the data collection can be carried out. Individual interviews followed suit and the last step in the sequential mixed method design of data collection was the use of documents to provide an analytical perspective of the application of the two principles of learning in gifted classrooms.

The research conclusions are appended accordingly with their respective research objectives.

**Research objective one:** to identify the effective teacher leadership for gifted education. Data for the first research objective was obtained by reading numerous literature, books, research, journals and papers concerning teacher leadership and gifted education. Three major areas emerged comprising a total of nine constructs that were identified as effective teacher leadership for gifted education. The concerned areas were (A) school leaders, (B) teacher leaders, and (C) principles of learning. Under these areas were nine attributes, namely (I) school leadership and climate; (II) distributed leadership; (III) relationship and positive influence; (IV)
collaboration; (V) professional learning community; (VI) professional development (VII) transformational leadership; (VIII) Bloom’s Taxonomy and (IX) Problem-based learning.

A research instrument was then designed utilizing the nine attributes as the main pillars to effective teacher leadership for gifted education. Five experts representing each segment of the major identified areas (school leaders, teacher leaders and principles of learning) were invited to validate the items suitability; two administrators, two teachers, and a gifted specialist/educational psychology expert. These experts took appropriately two weeks to examine and validate the 50 items asked in the semi-structured survey. Comments were made and changes were implemented before the final outcomes of the items were found to be in congruence with the corresponding objective of the constructs under investigation.

**Research objective two: to identify the current practices of teacher leadership that exists in gifted education.** There were three steps of data collection in addressing research objective two comprising quantitative and qualitative methods. A survey was launched first, followed by the qualitative data collection. The purpose for the second and third data collection strategies were to serve as a process of further refinement and clarification on the findings from the survey.

The research instrument in the form of a Teacher Leadership for Gifted Education Survey was administered using the purposive sampling method. The entire teacher population of 83 teachers at Mahidol Wittayanusorn School (MWITS) was chosen as it is Thailand’s only national high school for the gifted, as well as it holding the largest population of 720 gifted students annually. Moreover, the school’s curriculum has been designed by the country’s top agency; the Institute of the Promotion of Teaching Science and Technology, making it a valid population. The returned survey rate was at 93%, with 77 out of the 83 teachers returning the
completed surveys to the researcher. There were a total of 60 questions in the survey; with 8 demographic questions, 50 structured questions related to the nine identified teacher leadership constructs, and 2 open-ended questions for teachers to provide suggestions and additional comments.

Step 2 saw the administration of individual interviews conducted with top-performing teachers nominated by 24 Grade 12 students who have been in the school the longest (3 years). The teachers represented both the science and non-science subjects. Five teachers were interviewed with each session lasting no longer than an hour. The interview consisted of seven questions focusing on some of the key findings from the survey that needed further elaboration and clarification. The note-taking method was used to ensure the confidentiality of the interviewees as all teachers are currently employed at the school.

Step 3 involved the examination of documents such as lesson plans, class worksheets, assignment handouts etc. which was mainly used to analyze if the documents corroborated with the teaching application of the two principles of learning under study.

**Research objective three.** The framework was developed by consolidating the findings from both research objective one and two. The results from each of the data collected were synthesized and evaluated by five experts with vast experience in gifted education. As the experts held key positions in their respective organizations, and one living abroad, an email validation was opted, with the condition that the researcher is available to meet any expert upon request. One expert requested for a face-to-face meeting to discuss the framework.
The preliminary framework underwent some minor changes and the experts arrived at a consensus that the nine constructs identified as attributes to effective teacher leadership for gifted education in Thailand are feasible and can be operationally implemented.

**Discussion**

**Research objective one.** A content analysis to find the effective teacher leadership for gifted education was undertaken. Three major areas with their corresponding nine constructs were identified as attributes to teacher leadership. The constructs are *school leadership and climate* (Bamburg & Andrews, 1990; Duke 1982, Green, 2010; Gupton; Harris & Muijs, 2005), *distributed leadership* (Ash & Persall, 2000; Bennet, Harvey, Wise, & Woods, 2003; Burke, 2003; Chrispeels, 2004; Conger & Pearce, 2003; Green, 2010; Gronn, 2000; Hulphia & Devos, 2009); *relationship and positive influence* (Barth, 2001; Crowther, Kaagen, Ferguson, & Hann, 2002; Harris & Muijs, 2003, 2005; Katzenmeyer & Moller, 1996: 2001); *collaboration* (Green 2010; Gupton, 2010; Hargreaves & Shirley, 2012; Mitchell & Sackney 2001); *professional learning community* (Hoy and Hoy, 2009; McLaughlin and Talbert, 1994; Newman et al., 2000; Rosenholtz, 1989; Toole, Seashore-Louis, 2002; Wiley, 2001); *professional development* (Blasé and Blasé, 2004; Hargreaves, 1994; Harris and Muijs, 2005; Hoy and Hoy, 2009); *transformational leadership* (Bass, 1998; Burns, 1978; Hoy and Hoy, 2009; Northhouse, 2010); *Bloom’s Taxonomy* (Anderson, & Krathwohl, 2001; Davis & Rimm, 2004; Tomlinson, Kaplan, Renzulli, Purcell, Leppien, & Burns, 1999; Dixon, Prater, Vine, Wark, Williams, & Hanchon, 2004; Vygotsky, 18th century; Gabler & Schroeder, 2003); and *Problem-based learning* (Gallagher & Stepian, 1996; Hmelo-Silver, 2004 Cochran-Smith & Lytle, 2009; Croft, 2003; VanTassel-Baska, 2003, Zimmerman, 2002).
The discussion below highlights the important roles these nine constructs play as key enablers to effective teacher leadership.

*School leadership and climate.* For the 21st century, the call is on for school leaders to be visionary leaders, individuals who can articulate the school’s vision to all stakeholders, especially teachers. Effective school leaders are also those that inculcate a collaborative school culture that focuses strongly on teaching and learning, and engage teachers and other stakeholders to share, create, manage and implement instructional programs that meet the needs of all students (Green, 2010; Gupton; Harris & Muijs, 2005).

*Distributed leadership.* For the 21st century, the concept of school leadership is non-hierarchical, with leadership roles shared and distributed with teachers, hence, resulting in a flatter organization (Gronn, 2000; Hulphia & Devos, 2009). This involves school leaders communicating and entrusting their faith, and trust in teachers; and their decisions in making contributory improvements to student learning (Green, 2010). It is also logical that no one individual has all knowledge, skills and abilities to accomplish all leadership functions (Conger & Pearce, 2003). By distributing leadership, school leaders are providing positive directions to teachers, ultimately elevating teachers to positions they have never experienced before, paving ways for teacher leaders to emerge.

*Relationship and positive influence.* Crowther et al. (2002) posited that for teachers to be leaders, they must be regarded as competent, confident and approachable by their colleagues. Therefore, the task of exchanging ideas and sharing can happen naturally only if the above attributes are present in a teacher. Katzenmeyer and Moller (1996; 2001) shared the belief that teachers’ individual powers of establishing good relationship and influence over others that differentiate a teacher leader from the cohort.
Collaboration. Culture of collaboration as Hargreaves and Shirley (2012) coined reflects the new reinvented “collective autonomy” whereby teachers uphold strong commitment to shared responsibility, are involved in rigorous inquiry not only towards improvement but innovation. Harris and Muijs (200) stressed on the necessity for collaboration. The scholars pointed to the numerous benefits from collaboration. Teachers’ knowledge, expertise and capacities within a subject area gets pooled and collected, resulting in increased opportunities for teachers to learn and improve from one another.

Professional learning community (PCL). Rosenholtz’s findings in 1989 clearly underlined the need for PLC to take place in schools. His findings showed that teacher networks, cooperation between peers and expanded professional roles all led to increased teacher efficacy in meeting students’ needs. This was reaffirmed by McLaughlin and Talbert, who in 1994 confirmed Rosenholtz’s findings that when teachers are engaged in learning communities, collaborative inquiry takes place, and teachers are able to learn and develop as well as share a body of wisdom from their classroom experience. Furthermore, it was found that forging professional relationship between teachers, where they learn and work together, was central to sustaining school effectiveness (Newman et al., 2000).

Professional development. Over the years, research has singled out professional development as key component in driving successful school-level change and development (Hargreaves, 1994). Compelling research evidence has also supported the fact that when teacher learns, improvements are noticeably seen in student learning and achievement. Harris and Muijs (2005) also stressed on the importance of professional development whereby if continuously sought, can have positive impacts on curriculum and pedagogy. Furthermore, with professional
development, teachers find new and innovative instructional methods that can lead to sustainable changes and improvements to student learning.

*Transformational leadership.* Northouse (2010) defines transformational leadership as where leaders display charisma, trustworthiness, creativity, and high levels of articulation skills. Bass in 1995, described teacher leaders as „individuals acclaimed not only for their pedagogical excellence, but also for their influence in stimulating change and creating improvement in the schools…“. Therefore it is reasonable to say that the examination of teacher leaders’ classroom behaviors using transformational leadership as a frame of reference explains why excellent teachers tend to become teacher leaders.

*Bloom’s Taxonomy.* One of the most asked questions faced by educators are how students learn. The answer lies in Bloom Taxonomy. Bloom’s Taxonomy provides a strong foundation for teachers to understand how their students’ process their thinking through the multi-tiered principles of thinking. The hierarchical framework requires the accomplishment of a prior skill before moving on to another complex level, hence teacher should not jumpstart from any tier but gradually design their lessons to guide students from one tier to another. For gifted students, teachers must be aware of how to activate these intellectual students’ higher order thinking.

*Problem-based learning.* The mainstays of this principle of learning are communication skills, cooperative learning, self-responsibility, and self-evaluation. Constructivist in nature, PBL also provides room for independent learning which is highly suitable for gifted students. Gallagher and Stepien (1996) also stated that in searching for solution to authentic problems, students simultaneously learn content and research skills, which activate their higher order thinking where students will analyze and evaluate before creating a solution. Zimmerman
(2002) pointed out to the large gains received by students. Due to the open-ended nature of the problem, students are exposed to experimental learning which sees them investigating, explaining the phenomena before finally arriving to a meaningful resolution. Therefore, PBL is one of the foremost principle of learning advocated by scholars to be suitable for gifted students.

These nine constructs were then used to design the research instrument of 50 questions, with each construct having an average of 6 questions.

**Research objective two.** The findings will be discussed in three parts based on the 3-step sequence of the data collection. First step was a survey administered to all teachers at Mahidol Wittayanusorn School. The survey revealed that overall; the teacher leadership practices are visibly present at the school, though not all nine constructs showed similar consistencies. However, all nine constructs had means that were ranging from 3.15 to 4.12. None of the constructs were at the mid-point mean of 2.50 based on the 5-point scale of Likert measurement. This reaffirms that though there are glimpses of teacher leadership at the school, the trend of some of the practices are not significantly experienced by teachers.

Three constructs that were present significantly stronger than the others were **collaboration, relationship and positive influence; and transformational leadership.** It is interesting to note that these three constructs are concerned with a teacher’s self-efficacy; especially their interpersonal skills that they share with their teacher-colleagues and students. In short, these attitudes are within the control of individual teachers. Findings under **relationship and influence** indicated that the teachers were highly successful in respecting the different values and beliefs of their colleagues, that they were good listeners in exchanging teaching
experiences, that they were happy to assist their colleagues in non-related teaching matters. As for collaboration, teachers showed positive reactions to receiving feedback and comments from fellow teachers in an atmosphere where trust and respect among teachers prevail. Teachers were happy sharing teaching materials and were open to asking for help from other teachers when the need arises for some creative teaching ideas. In terms of transformational leadership, the teachers scored significantly in the communication of learning goals to students and motivating their students towards learning goal attainment. Teachers also practiced the integration of moral issues and ethics in classroom learning. In creating good relationships with students, the findings indicated that teachers made time to have small conversations with their students, before and after class. This supports the research findings which purported that a school’s learning outcome is associated with more positive teacher and student relationship (Gehlbach et al, 2011; Moos & Moos, 1978)

Four constructs that scored relatively well within the mean range of 3.50 – 3.70 were school leadership and climate, Bloom’s Taxonomy, problem-based learning, and professional development. Findings revealed that teachers scored relatively well with the use of differentiation strategies in engaging students. They were comfortable with the use of questioning, role-playing, debates, brainstorming, concept-maps, inquiry-based learning etc. The continuous use of varied teaching methods have been found to result in higher student engagement and subsequently, successful learning. Fenner et al. (2010) reaffirmed this when they found in their study that, students’ motivation level increased with teachers’ good instructional designs. An item under school leadership and climate that scored relatively well was the definition and communication of the school goals to teachers. Teachers were well aware of the school’s goals. The two items under the respective principles of learning that
scored well with the teachers were the use of effective questioning in classrooms. Teachers professed that they used triggering, probing, analyzing, redirecting, follow-up types of questioning in encouraging the application of the gifted students’ higher order thinking skills. Under professional development, the findings revealed that teachers were all generally happy with the teaching and learning resources, materials and technology available at the school. Furthermore, teachers also indicated that they were consistently searching for new teaching techniques to improve their professional skills.

Two constructs that were ranked at the moderate end of the means score ranging from 3.15 to 3.38 were distributed leadership and professional learning community. The former ranked the lowest of the nine constructs. One significant item that teachers wanted was to see a more open communication channel between administrators and teachers where discussions involving school improvement and student learning could take place smoothly. Besides that, under professional learning community, teachers felt that they needed more time to develop professionally.

Step 2 of the data collection, was a one-on-one interview. Top-performing teachers were interviewed and there were 7 questions posed to clarify some of the findings from the survey. The interview findings revealed that teachers were generally very happy and impressed with the school’s facilities in terms of the teaching and learning facilities. Teachers felt that the equipment and resources were befitting the needs of a special education. The teachers also agreed, albeit not unanimously, that the level of collaboration existing between teachers were good, where teachers were able to freely discuss about their teaching methods, teaching materials etc. with their colleagues. This correlated with the findings from the survey, where collaboration scored the highest mean. Similarly, some significant responses from the interview
supported and confirmed the findings of the survey. The issue of time and knowledge were the two significant issues brought to the researcher’s attention. All five teachers cited teachers in the school lacked time as the obstacle to their professional growth and development, and all teachers agreed that the teachers teaching in a gifted school should undergo training on how to teach gifted students, as the basic knowledge in teaching alone may be insufficient. This is parallel to what six gifted experts agreed on when they were asked of the “core non-negotiables” that teachers of the gifted ought to have. Gallagher, Kaplan, Reiss, Renzulli, Tomlinson, and VanTassel-Baska believed that teachers need to be aware and understand the different services and methods available to meet these gifted students’ needs and if teachers do not possess this background in existing methods, it is unlikely that implementation will occur. The scholarly six argues that the scope of the teaching and learning need to move beyond low level processing and into more advanced areas of knowledge and skills, and therefore it is important that teachers know how to take their students gradually up the taxonomy of how human processes their thinking.

An interesting note is that only four out of the five teachers had an understanding of Bloom’s Taxonomy. However, the teacher that was not familiar with Bloom Taxonomy did demonstrate the application of the thinking classifications in the teaching methods used in the classroom as seen in the documents. This particular finding obtained from the interview helped provide further clarification to the survey findings whereby only a medium mean was scored for the understanding on Bloom’s Taxonomy. Although initial findings from the survey revealed that teachers belonged in two extremes; that is, they were either “knowledgeable about Bloom” or “not knowledgeable about Bloom”; sequential data collection of the interview helped allay this shortcoming to some extent. From the interview, it was found that the top-performing
teachers were already practicing the taxonomy in their classrooms, although one may be unaware of it theoretically. On the other hand, this does not necessary mean that all teachers at the school who are unaware of Bloom”s Taxonomy are applying the thinking classifications in their classrooms. Leta Hollingworth, in her teaching for the gifted cautioned that when teachers are not adequately equipped with knowledge and skills, complex teaching methods will not prevail. Pedagogy excellence can only be attainable if it includes curriculum differentiation, higher-order thinking, and inquiry-based teaching, and that requires teachers”” understanding of intellectual conceptual knowledge and skills appropriate for gifted learners. Therefore, this matter on teachers”” understanding of Bloom needs further investigation.

The interview also shed some pertinent information on teachers”” use of problem-based learning tasks in their teaching. Four teachers from the science subjects provided valuable information as to why PBL tasks were not widely assigned. The teachers were already using inquiry-based learning method in their teaching, which is one of the other highly advocated principles of learning suitable for gifted science students. Moreover, the teachers felt that the students” research projects were problem-based in nature hence PBL tasks were not often assigned to students due to it being time-consuming and complex. However, the interview obtained from the non-science teacher revealed that PBL is practiced at least once a semester.

Step 3 and the final step of data collection saw the examination carried out on documents in support of the application of the two principles of learning in classrooms. The documents analyzed were lesson plans, class worksheets, assignment handouts and mini-projects. The findings from documents revealed that these top-performing teachers apply instructional strategies that trigger the gifted students”” higher order thinking, and all teachers
apply PBL tasks in their teachings; some as classroom tasks and some as the students’ research project which is one of the school’s graduation requirements.

**Research objective three.** A framework was designed and developed through the synthesis of findings from content analysis, survey, interview, and document analysis. The framework encompasses three major areas and their corresponding nine constructs that are said to contribute to effective teacher leadership for gifted education. The three major areas are indicated in the outer ring, while each of their respective constructs located in the inner ring. The triangle represents the ultimate output, which is to achieve effective teacher leadership for gifted education in Thailand. There is no pre-directional start point as each area and construct share equal importance. The relationship between each area is dyadic, intertwined and revolving.

The leadership for the 21st century calls for a reconceptualization of the school, whereby to provide effective leadership, school leaders must make a connection with stakeholders inside (teachers, students) and outside the school (community), and as Green (2010) has listed as one of the implications of leadership. Furthermore, he stated that, it is also largely the depth of the relationship that exists between and among individuals that contributes to a leader’s success in school. If this is true, collaboration is the best practice that must prevail. Findings from this study have already revealed that at Mahidol Wittayanusorn School, collaboration is the highest ranked construct out of the nine listed teacher leadership attributes. Green (2010) went on to mention that, an effective 21st century school is where individuals work in concert with each other to enhance student achievement. Staff members have high regard for one another, trust one another, and respect each other’s opinion. Once again, per item score, this was the highest
item out of the total 50 items that was scored strongly by teachers at Mahidol Wittayanusorn School.

Therefore, in conclusion, the researcher believes Mahidol Wittayanusorn School does show some exemplary teacher leadership practices as mentioned in the preceding paragraph. Collaboration, and trust and respect for each other’s beliefs and values are the constructs that can be used advantageously. However, to provide an excellent framework of teacher leadership practices for gifted education or general education, more effort must be focused on improving two of the lower ranked constructs, especially professional learning community and distributed leadership. Professional learning community can be immediately promoted at the school, as collaboration is already present; however, teacher has mentioned that because of time constraint, it has prevented them from participating in more teaching and learning exchanges with their peers or self-reflection into their own practices. Similarly, collaboration should not stop at teacher-level only, but must spill over to school leadership so that leadership is more dispersed, distributed and collectively shared.

**Recommendations**

Teacher leadership is one of the mainstays of a successful school. Research over the years have revealed that despite effective school leaders having positive influence on student learning success, it is the effort of teachers that directly affected students’ achievement (Leithwood and Jantzi, 2000). This sentiment was also shared by Eggen and Kauchak (2006), where they stated matter-of-factly that, teachers are the most essential educational determinants of student learning and development. Hargreaves and Shirley (2012) also supported this when
they claimed that teaching has been statistically found to have the strongest influence within schools on student achievement. Therefore, the call for teachers to assume leadership has never been stronger in the 21st century.

This study was set out to determine the effective teacher leadership for gifted education in Thailand. The findings from the study revealed that some exemplary teacher leadership practices are already visibly permeating at the country’s only national high school of the gifted. However, based on some of the findings of the study, the following recommendations are offered to both school leaders and future researchers:

**Recommendation to School Leaders**

1. Make more participatory vs authoritative decision making on issues regarding teaching and learning. More participatory effort from many individuals than a single individual has been advocated for today’s schools.

2. Practice open communication with teachers so that expression of ideas and thoughts on teaching and learning improvements can occur.

3. Provide teachers with sufficient time to take stock of their teaching practices, undertake better lesson planning, as well as participate in more collaborative acts with their colleagues in either the exchange of teaching ideas, or the creation of a professional learning community. Ovando (1994) in his study revealed that a central component leading to school success is „having the time to meet”. Schools that were on the road to improvement gave teachers dedicated time to collaborate with one
another. Furthermore, the world’s top-performing schools such as in Finland and Singapore are practicing teach less learn more (TLLM) practice.

4. Encourage teachers to undertake on-going professional development courses to develop their skills. Six renowned scholars in gifted education stressed on the importance of teachers teaching gifted students to know the various teaching methods to meet their students’ needs. These scholars believed that without proper gifted training, the implementation of good instructional strategies for the gifted will not take place.

5. This new knowledge on the nine constructs can be implemented in schools as the nine constructs were identified through arduous reading of literature, papers and books etc. Furthermore, these nine constructs are also present at the country’s number one high school from findings of survey, interview and document analyses. Therefore, the framework serves as a good model for effective teacher leadership practices. The nine constructs provide good start-up points for school leaders and teachers to explore in the hope of achieving pedagogical excellence in classrooms.

**Recommendation for Future Research**

1. One other data collection that can help examine if teachers are practicing some of the advocated principles of learning suited for gifted learners is to conduct classroom observations.

2. More research should be undertaken focusing on distributed leadership, one of the
least perceivable attributes at the school under study. Lashway (2003) termed distributed leadership as being in its embryonic stage where more investigation should be underway to elucidate the relationship between distributed leadership and school improvement. Furthermore, with distributed leadership representing a powerful concept of new thinking about school leadership today, Harris (2005) reiterated the high need to identify what constitute distributed leadership, and the conditions for it to flourish and grow in a school environment.
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APPENDIX A

Content Analysis for Effective Teacher Leadership

School goals                                     Goal
Instructional goals                                                            Defining & communicating
Performance goals                                                                      school goals
Communicating goals                            defining
Defining goals
School climate                       Climate in school
Organizational culture
Supportive                                                                        School positive climate
Encouraging                               Positive
Nurturing
Recognition
Two way communication                          Open communication            Distributive leadership
Decision making                                                                 participatory
Instructional leadership
Shared leadership
Congeniality                             Build relationship
Persuasive
Good listener                                                                         Building relationship &
Trust & Respect                                                      Influence       Influencing others
Collegiality
Modeling
Aware of differences
Promote teamwork
Establish cooperation                                        Promoting collaboration
Teacher collaboration
Collaborative instruction
Collaborative network
Create teacher network
Peer sharing/exchange                        Create
Peer learning
Peer reflecting
Shared purpose
Caring
Intellectual Reflection
Pedagogical knowledge
Shared decision
Joint collaboration
Inquiry spirit
Commitment to learn
Professional teacher
Formal learning
Informal learning
Access new ideas
Experiment
Promote coaching

Promoting collaboration
Creating
Professional
Learning
Community

Enhancing
Professional
Development
APPENDIX B

Reading list for content analysis


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APPENDIX C
The Item Objective Congruence Form
Content Validity for Questionnaire

This questionnaire is intended to study the current practices of teacher leadership in gifted education in Thailand, specifically at Mahidol Wittayanusorn School. The questionnaire will be distributed to all teachers currently teaching at the school, both local and foreign teachers. The questionnaire with a total of 60 questions is divided into three parts.

Part 1: 50 questions about the current practices of teacher leadership.
Part 2: 2 open-ended questions on suggestions for development of effective teacher leadership, and any teaching/instructional methods that the respondent has introduced in the classroom.
Part 3: 8 questions on the demographic information of the respondents.

Please determine the content validity score as the following:
The score = 1, if you are sure that this item really measures the attribute.
The score = -1, if you are sure that this item does not measure the attribute.
The score = 0, if you are not sure that the item measures or does not measure the expected attribute.

Expert’s Information on Content Validity of the Research Instrument.
Expert’s Full Name: _____________________________
Academic Rank: ____________   Highest Degree: _____________________________
University you obtained the degree _________________________________________
Work Position: _________________________________________________________
Organization: __________________________________________________________
Years of Experience in gifted education___________________________________
Your affiliation with Mahidol Wittayanusorn School (eg. Former director, school board member, ex-teacher etc.)
**Part I (Please tick (√) accordingly under the level of appropriateness)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Questions</th>
<th>Level of Appropriateness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The school goals are defined and communicated to me.</td>
<td>1 0 -1 Comments</td>
</tr>
<tr>
<td>2.</td>
<td>The curriculum goals are achievable by my students.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>The administrators are aware of and recognize my teaching skills of gifted students.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>The administrators welcome and encourage teachers to give ideas and opinions in improving student learning (eg. <em>curriculum goals, assessments, class groupings, teaching methods etc.</em>)</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>The administrators encourage teachers to be leaders in the</td>
<td></td>
</tr>
</tbody>
</table>

**School Leadership & Climate**

*Defining and communicating school goals*

**School leadership** refers to the type of leadership displayed by the school administrators or principals who lead and manage the school.

**School climate** is a characterization of the internal climate of the school that encompasses school’s atmosphere, tone, the personality or ethos of the school (Green, 2010).

**School goals** refer to the vision and mission of the school.

**Curriculum goals** refer to the goals that have been prescribed in the course outline based on the school’s goals and objectives.

**Teaching skills** include instructional methods and strategies used in teaching.
6. The administrators and teachers share open communication.

7. The administrators involve teachers in decision-making concerning school improvement, student learning, curriculum planning etc.

### Teacher Leadership

*Building relationship and influencing others*

**Teacher leadership** is the process by which teachers, individually or collectively; influence their colleagues, principals, and other members of the school community to improve teaching and learning practices with the aim of increased student learning and achievement (York-Barr & Duke, 2004).

<table>
<thead>
<tr>
<th>Item</th>
<th>Questions</th>
<th>Level of Appropriateness</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>I find time to exchange ideas and reflect with my colleagues on our teaching practices.</td>
<td>1</td>
</tr>
<tr>
<td>9.</td>
<td>I consider myself persuasive and can influence my colleagues.</td>
<td>0</td>
</tr>
<tr>
<td>10.</td>
<td>I listen attentively to my colleagues when they talk about their teaching experiences.</td>
<td>-1</td>
</tr>
<tr>
<td>11.</td>
<td>I give advice to my colleagues when I feel an idea is not appropriate.</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>I try to initiate ideas or new methods with my colleagues to improve our teaching.</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>I am happy assisting my colleagues in non-teaching related issues (eg. the use of audio-visuals, classroom equipment, Microsoft skills or other programs, etc.)</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>I respect and understand the different values and beliefs of my colleagues.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Teacher Leadership</strong></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------------------------</td>
<td>---</td>
</tr>
<tr>
<td>15.</td>
<td>I share teaching materials and teaching strategies with my colleagues.</td>
<td>1</td>
</tr>
<tr>
<td>16.</td>
<td>I seek help for good and creative teaching ideas from my colleagues.</td>
<td>1</td>
</tr>
<tr>
<td>17.</td>
<td>I am comfortable having my class observed anytime by my colleagues.</td>
<td>1</td>
</tr>
<tr>
<td>18.</td>
<td>I welcome constructive feedback and help from my colleagues.</td>
<td>1</td>
</tr>
<tr>
<td>19.</td>
<td>There is a climate of trust and respect for each other among colleagues.</td>
<td>1</td>
</tr>
<tr>
<td>20.</td>
<td>There is strong collaboration among teachers in my department with teachers in other departments.</td>
<td>1</td>
</tr>
</tbody>
</table>

**Teacher Leadership**

*Creating Professional Learning Community*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.</td>
<td>Teachers in the school share good relationship with each other personally and professionally.</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Teachers in my school actively engage in discussions regarding improvements in teaching through social network, discussion forums etc.</td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Teachers in my department have a regular scheduled time to reflect and discuss teaching practices. (<em>regular= at least once a month</em>)</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>Teachers in my department actively share new ideas gained from reading, attending training or workshops with each other.</td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>Teachers in my department discuss and share new instructional techniques and strategies in a formal/informal setting (excluding department meetings etc.).</td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>Teachers in my department welcome critical feedback and comments from colleagues.</td>
<td></td>
</tr>
</tbody>
</table>
## Teacher Leadership

### Enhancing Professional Development

<table>
<thead>
<tr>
<th>Item</th>
<th>Questions</th>
<th>Level of Appropriateness</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.</td>
<td>Teachers are supported with regular training sessions on latest instructional practices, attend workshops and conferences. (<em>can be either from school or teacher initiative</em>)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>Teachers are supported with professional resources, materials and technology.</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>29.</td>
<td>Teachers are allotted and encouraged to dedicate fixed-hours of time towards professional development.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>My school frees time for teachers to develop professionally.</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>31.</td>
<td>My school provides financial program for individual development.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>I try to search and read new teaching techniques to improve my professional skills.</td>
<td>0</td>
<td>-1</td>
</tr>
</tbody>
</table>

## Transformational Leadership

Transformational Leadership is where leaders display charisma, trustworthiness, creativity, and high levels of articulation skills, and their exceptional communication skills allow them to navigate through their organizations with positive self-assurance (Northouse, 2010).

<table>
<thead>
<tr>
<th>Item</th>
<th>Questions</th>
<th>Level of Appropriateness</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>33.</td>
<td>I make small conversations with students before and after class to get to know them better as individuals.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>I integrate my lessons with issues on morality and ethics.</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>35.</td>
<td>I communicate the school’s goals to my students and motivate them towards the goals.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td>I establish personal relationships with my students (<em>eg. their family background, their aspiration, understanding them as a person</em>).</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>37.</td>
<td>I avoid distractions from individual students (<em>eg. students who</em>...</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
are not paying attention, unfocused, talking, playing their computer, mobiles while teacher is teaching etc.) by talking to them and try to find ways to solve the problem.

38. I use new instructional approaches and innovative ways in motivating my students to learn.

<table>
<thead>
<tr>
<th>Item</th>
<th>Questions</th>
<th>Level of Appropriateness</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>39.</td>
<td>I have an understanding of Bloom’s Taxonomy of Learning from my professional/teacher training.</td>
<td>1 0 -1</td>
<td></td>
</tr>
<tr>
<td>40.</td>
<td>I am aware of the varying levels of thinking in Bloom and consciously plan my lessons to take my students gradually up the taxonomy levels.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41.</td>
<td>I use the *inductive approach more than the deductive approach in my teaching to guide students thinking. (Inductive approach analyzes pertinent facts to generate a concept or principle. Deductive approach defines a concept or principle then develops it with facts)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42.</td>
<td>My lessons encourage the application of the higher order thinking skills (analyze, evaluate and create).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>43.</td>
<td>I use questioning, role-playing, debates, brainstorming, concept maps, peer interaction etc. in my classrooms (please specify in comment box your most used instructional</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
I see assessments as a measure of improving my students’ higher order thinking skills.

**Principles of Learning**

**Problem-based learning**

**Problem-based learning** is when students immersed in real-world, complex situations in their learning of the curriculum whereby open-ended problems are posed to challenge students to think of the many ways of solving a problem.

<table>
<thead>
<tr>
<th>Item</th>
<th>Questions</th>
<th>Level of Appropriateness</th>
<th>Comments</th>
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<tbody>
<tr>
<td>45.</td>
<td>I use effective questioning (<em>eg. trigger, probe, analysis, redirect, follow-up etc. type of questions</em>) in starting my lesson and throughout my lesson.</td>
<td>1 0 -1</td>
<td></td>
</tr>
<tr>
<td>46.</td>
<td>I introduce significant real-life issues and authentic problems to my students to solve.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47.</td>
<td>I do more *peer-group in the classroom tasks than allow students to work individually. (<em>peer-group refers to grouping students to work cooperatively together</em>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48.</td>
<td>I assign students at least one complex task in one semester to allow for self-directed study in their groups to solve a problem.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>49.</td>
<td>I initiate new teaching strategies with other teachers (<em>eg. team-teaching, peer-learning among students, interdisciplinary learning with teachers from other departments etc.</em>).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50.</td>
<td>I prefer using open-ended questions in assessments to measure my students’ creativity and problem-solving skills.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX D

List of Experts for Content Validity of Research Instrument

1. Dr. Thongchai Chewpreecha, former school director of Mahidol Wittayanusorn School, former President of Institute for the Promotion of Science and Technology – IPST.

2. Dr. Linda Yeh, Department of Special Education, Faculty of Education, Srinakharinwirot University.

3. Dr. Washirasorn Saengsuwan, Associate Dean for Academic Affairs, Faculty of Education, Suan Sunandha Rajabhat University, former Chemistry teacher of Mahidol Wittayanusorn School.

4. Dr. Sumalee Waiyarod, Postdoctoral research fellow at Harvard School of Engineering and Applied Sciences, former Physics teacher of Mahidol Wittayanusorn School.

5. Ms. Vachiravan Bunnag, Assistant Principal, Mahidol University International Demonstration School. Former Assistant Principal and Department Head of Social Science and Arts, Mahidol Wittayanusorn School.
APPENDIX E

Questionnaire for Teachers at Mahidol Wittayanusorn School

Teacher Leadership for Gifted Education

This survey is being conducted with all teachers currently teaching at Mahidol Wittayanusorn School, the national science school for the gifted in Thailand. The purpose of the survey is to investigate your perception on teacher leadership. Your responses are completely confidential and will assist our school in any improvement efforts especially for teachers. Please take a few minutes to complete the questionnaire. If you have any additional comments, please include them at the space provided. Thank you for your kind participation.

*Teacher Leadership is defined as the process by which teachers, individually or collectively; influence their colleagues, principals, and other members of the school community to improve teaching and learning practices with the aim of increased student learning and achievement.*

For the following statements, please circle the number that best describe your feelings.

1. The school goals are defined and communicated to me.
2. The curriculum goals are achievable by my students.
3. The administrators encourage teachers to be leaders in the school.
4. The administrators and teachers work positively as a team and share good partnership.
5. The administrators involve teachers in decision-making concerning school improvement, student learning, curriculum planning etc.
6. The administrators and teachers share open communication where teachers are able to freely discuss their opinions and

<table>
<thead>
<tr>
<th>No</th>
<th>Questions</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The school goals are defined and communicated to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>The curriculum goals are achievable by my students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3.</td>
<td>The administrators encourage teachers to be leaders in the school.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<td>4.</td>
<td>The administrators and teachers work positively as a team and share good partnership.</td>
<td>1</td>
<td>2</td>
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<td>5.</td>
<td>The administrators involve teachers in decision-making concerning school improvement, student learning, curriculum planning etc.</td>
<td>1</td>
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<tr>
<td>6.</td>
<td>The administrators and teachers share open communication where teachers are able to freely discuss their opinions and</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
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<tr>
<td></td>
<td>concerns towards school improvement and student learning.</td>
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<td>7.</td>
<td>I am satisfied with the teaching and learning environment that exists in the school.</td>
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<td>2</td>
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<td>8.</td>
<td>I find time to exchange ideas and reflect with my colleagues on our teaching practices.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
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<td>9.</td>
<td>I consider myself persuasive and can influence my colleagues.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>10.</td>
<td>I listen attentively to my colleagues when they talk about their teaching experiences.</td>
<td>1</td>
<td>2</td>
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<td>5</td>
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<tr>
<td>11.</td>
<td>I give advice to my colleagues when I feel an idea is not appropriate.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12.</td>
<td>I try to initiate ideas or new methods with my colleagues to improve our teaching.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13.</td>
<td>I am happy assisting my colleagues in non-teaching related issues (eg. the use of audio-visuals, classroom equipment, Microsoft skills or other programs, etc.)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14.</td>
<td>I respect and understand the different values and beliefs of my colleagues.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>15.</td>
<td>I share teaching materials and teaching strategies with my colleagues.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
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<tr>
<td>16.</td>
<td>I can seek help whenever the need arises for good and creative teaching ideas from my colleagues.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>17.</td>
<td>I am comfortable having my class observed anytime by my colleagues.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18.</td>
<td>I welcome constructive feedback and help from my colleagues.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19.</td>
<td>There is a climate of trust and respect for each other among colleagues.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20.</td>
<td>There is strong collaboration among teachers in my department with teachers in other departments.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>21.</td>
<td>Teachers in the school share good relationship with each other personally and professionally.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>22.</td>
<td>Teachers in my school actively engage in discussions regarding improvements in teaching through social network, discussion forums etc.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23.</td>
<td>Teachers in my department have a regular scheduled time to reflect and discuss teaching practices. (*regular=at least once a month)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24.</td>
<td>Teachers in my department actively share new ideas gained from reading, attending training or workshops with each other.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>25.</td>
<td>Teachers in my department discuss and share new instructional techniques and strategies in a formal/informal setting (excluding department meetings etc.).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26.</td>
<td>Teachers in my department welcome critical feedback and comments from colleagues.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27.</td>
<td>Teachers are supported with regular training sessions on latest instructional practices, attend workshops and conferences. (can be either from school or teacher initiative)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>28.</td>
<td>Teachers are supported with professional resources, materials and technology.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>29.</td>
<td>Teachers are allotted and encouraged to dedicate fixed-hours of time towards professional development.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>30.</td>
<td>My school frees time for teachers to develop professionally.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>31.</td>
<td>My school provides financial program for individual development.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>32.</td>
<td>I try to search and read new teaching techniques to improve my professional skills.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>33.</td>
<td>I make small conversations with students before and after class to get to know them better as individuals.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>34.</td>
<td>I integrate my lessons with issues on morality and ethics.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>35.</td>
<td>I communicate the learning goals to my students and motivate them towards the goals.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
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<tr>
<td>36.</td>
<td>I establish personal relationships with my students (e.g. <em>their family background, their aspiration, understanding them as a person</em>).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>37.</td>
<td>I avoid distractions from individual students (e.g. <em>students who are not paying attention, unfocused, talking, playing their computer, mobiles while teacher is teaching etc.</em>) by talking to them and try to find ways to solve the problem.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>38.</td>
<td>I use new instructional approaches and innovative ways in motivating my students to learn.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>39.</td>
<td>I have an understanding of Bloom’s Taxonomy of Learning from my professional/teacher training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>40.</td>
<td>I am aware of the varying levels of thinking in Bloom and consciously plan my lessons to take my students gradually up the taxonomy levels.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>41.</td>
<td>I use the <em>inductive approach</em> more than the deductive approach in my teaching to guide students thinking. (<em>Inductive approach analyzes pertinent facts to generate a concept or principle. Deductive approach defines a concept or principle then develops it with facts</em>)</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>42.</td>
<td>My lessons encourage the application of the higher order thinking skills (analyze, evaluate and create).</td>
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<td>2</td>
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<td>5</td>
</tr>
</tbody>
</table>
| 43. | I use questioning, role-playing, debates, brainstorming, concept maps, peer interaction etc. in my classrooms. *(please specify below your most used instructional technique. You may specify more than one technique)*  
*Technique used:__________________________________________________________________________  
______________________________________________________________________________________ | 1 | 2 | 3 | 4 | 5 |
| 44. | I see assessments as a measure of improving my students’ higher order thinking skills. | 1 | 2 | 3 | 4 | 5 |
| 45. | I use effective questioning (e.g. *triggering, probing, analyzing, re-directing, follow-up etc. type of questions*) in starting my  
questioning, role-playing, debates, brainstorming, concept maps, peer interaction etc. in my classrooms. *(please specify below your most used instructional technique. You may specify more than one technique)*  
*Technique used:__________________________________________________________________________  
______________________________________________________________________________________ | 1 | 2 | 3 | 4 | 5 |
lesson and throughout the course of my lesson.

46. I introduce significant real-life issues and authentic problems to my students to solve.  
   1 2 3 4 5

47. I do more *peer-group in the classroom tasks than allow students to work individually. (peer-group refers to grouping students to work cooperatively together)  
   1 2 3 4 5

48. I assign students at least one complex task in one semester to allow for self-directed study in their groups to solve a problem.  
   1 2 3 4 5

49. I create new teaching strategies with other teachers.  
   1 2 3 4 5

50. I prefer using open-ended questions in assessments to measure my students’ creativity and problem-solving skills.  
   1 2 3 4 5

Part II.
51. What other factors that can lead to effective teacher leadership in our school? (you may write at the back of the questionnaire if you need space)  
____________________________________________________________________________

52. What teaching/instructional methods have you introduced in your classroom in the last one year? (please specify or briefly describe)  
____________________________________________________________________________

Part III About You  
53. What is your sex? □ Male □ Female

54. What is your age? □ 21-25 □ 36-40 □ 51-55 □ 26-30 □ 41-45 □ 56 years and above □ 31-35 □ 46-50

55. What is your highest educational qualification? Please select where appropriate.
   o Bachelor __________________________________________
      Major __________________________ University_____________________________
   o Masters __________________________________________
      Major __________________________ University_____________________________
   o Doctor __________________________________________
      Major __________________________ University_____________________________
56. Are you currently studying or do you have plans to pursue a higher degree? Please select where appropriate.

  □ I am currently studying ________________________________________________
  □ Yes, I have plans to pursue a higher degree
  □ No, I have no plans to pursue a higher degree

57. How long have you been a professional teacher in this school? ____________________

58. Have you had any training in gifted students/gifted education? (please specify)

59. What is the subject(s) that you are teaching? ____________________________________________

60. What grade level(s) are you teaching? ____________________
1. What is your definition of gifted students?
2. Does the teaching and learning environment in the school facilitate student learning? Provide a reason for your answer.
3. How do you think the school leadership can help teachers to emerge as leaders?
4. What is the current level of collaboration that exists among teachers in your department? Please explain.
5. Do you feel teachers are generally equipped with sufficient skills in teaching gifted students?
6. Are you familiar with Bloom’s Taxonomy of learning? How do you structure your lessons based on this taxonomy especially in the application of higher order thinking skills. (analyze, evaluate and create) Please briefly explain.
7. How often do you use problem-based learning technique in your teaching?
APPENDIX G – Teacher 1

Lesson Plan 9 (Week 5)       Date: Wed, June 19, 2013

Objectives:

1. Role-play news talk from selected news articles.

   Materials: a) newspapers from both The Nation and Bangkok Post.

   b) news talk samples from CNN, The Nation Channel

Procedures:

1. SPEAKING (ROLE PLAYING AS NEWSCASTERS) (50 min)

   - T explains the role of newscasters, news presenters.
   - T distributes sections of newspaper for SS to work in groups of 2 or 3.
   - T gets SS to use their creativity in “producing” a lively script of a news talk, news interview based on the news that they have selected. T gives Ss 20 minutes to work on a 2-minute news show.
   - T reminds SS that the objective is to ensure the audience understands the key message, incidences. **Primary importance: how to make the news interesting that the viewers will not change the channel. Tip: Name your channel/news program, can do live, telephone interviews, or by correspondence etc.**

REMINDER: (REPEAT REMINDER)

T reminds Ss once again that the assignment on “one-on-one” interview on their careers will be conducted next week. T releases interview cue.

T informs SS to bring their laptops as while their friends are being interviewed, the rest will be assigned to their groups to start working on their project work.
APPENDIX H – Teacher 1

PICTURE DISCUSSION

Assessment Criteria:

- Interpretation and Explanation
  - interpret and explain the situations in the picture with supporting details.

- Language
  - use a variety of appropriate vocabulary and structures to complete the task.

- Coherence
  - develop ideas in a clear and coherent manner.

To achieve Band 1 (10-12 marks), criteria is:
1. Thoughtful interpretation supported by detailed observations.
2. Wide and suitable range of vocabulary and sentence structures.
3. Develop interpretation coherently on any aspect of the picture and is satisfying to the listener.

Always prepare your answers to these 3 questions during the preparation time:

Q1. What do you think is happening here?
Q2. What do you think he/she might be thinking / feeling?
Q3. What might happen next? OR What do you think happened prior to this event?

3 GOLDEN RULES (for answering examiner's questions):

- Every inference should be supported by an observation from the picture.
- ALWAYS link your inferences to answering the examiner’s question
- Use vivid verbs and precise vocabulary wherever possible

Q1. What do you think is happening here?
3-Step Approach
1. Use background details to infer the occasion / event.

2. Use the central figure in the picture to make an inference about the occasion / event by explaining his/her role in the event.

3. Make inferences with supporting details about ALL the main characters in the picture from left to right. For each character, use one or more of the following strategies:-

   (a) Describe the character’s dressing and use it to make inferences about the event or his/her identity or role in the event.

   (b) Describe the character’s facial expression and use it to make inferences about his thoughts / feelings on what he’s doing.

   (c) Describe the character’s actions/posture and use them to make inferences of the character’s thoughts/feelings OR the event.

   (d) Describe how the character is interacting with another character and make inferences about their relationship.

Q.1 ‘What do you think is happening here?’
How to Apply Step 1
(Using background and other details to infer the event)

➢ Using background details to make an inference about the occasion / event.

Eg. In the background, I can see elaborate paintings hanging from the wall and marble pillars supporting the building. [observations] These furnishings indicate that the place could be an Art Museum and this event may be a learning journey to the museum. [interpretation]

➢ Using the people’s actions or expressions to make an inference about the event.

Eg. The students behind the guide are all clutching writing pads with the same emblem on them. They are responding enthusiastically to his explanation and following closely behind him. [observations] This supports my view that they are on a learning journey at the museum. [interpretation]

How to Apply Step 2
(Using the central figure to infer his role in the event)

➢ Using the people’s dressing to make an inference about their role in the event.

Eg. The person in the middle of the picture is clad in a traditional western suit complete with a cravat and knee-length cotton stockings. [observations] It reminds me of the dressing of Sir Stamford Raffles. He could be a teacher or a guide at the museum dressed to play this role for the occasion. [interpretation]
How to Apply Step 3  
(Making inferences about the main characters from left to right or from foreground to background)

- Using a person’s actions to infer his relationship with another person.

Eg. On the extreme left of the picture, a man dressed in a striped polo t-shirt is bent over an elderly lady. He appears to be monitoring the progress of the health check-up with great concern. [observations] He is probably a close family member of the elderly lady and has accompanied her to the health screening. [interpretation]

4 useful strategies:

1. Use the person’s expression or body language to infer what he/she is thinking or feeling.
   Eg. The man on the extreme right is resting his face on his right hand, appearing to be deep in contemplation. He has a grim expression on his face. [observations] He could have a problem on his mind and is mulling over the alternatives for the solution to the problem. [interpretation]

2. Use the person’s dressing to infer what he/she is thinking or feeling.
   Eg. As the man is dressed in a formal long sleeved shirt which is suitable for work in the office, he is probably on his way back from work. [observations] Thus, he may be pondering over a problem which he has just encountered at his workplace. [interpretation]

3. Use the actions of other people in the picture to infer the thoughts/feelings of the person.
   Eg. The third man from the right of the picture is glancing at the man beside him who is beaming delightedly while clasping a toddler in his arms. [observations] As he looks to be of a similar age to the man beside him, the toddler may have reminded him of his own grandchildren. He could be making a comparison in his mind between the toddler and his own grandchildren. [interpretation]

4. Use the background details or event to infer the thoughts/feelings of the person.
Eg.

There is a man seated beside the lady who is dozing off. He seems to be staring blankly into the distance. As this appears to be the interior of an MRT train, [observations] the man may be wondering how long the journey would last and when he would arrive at his desired destination. [interpretation]
APPENDIX I – Teacher 1

Lesson Plan 19 (Week 11)      Date: Wed, Jul 31, 2013

Objectives:
1. Understand natural speech, identify topic of conversations and make inferences.
2. Understand the requirements of Project Work and deadlines.
3. Listen to dialogues and brief lectures (in preparation for exit examination)
4. Describe and analyze charts, graphs etc. using appropriate words.

Materials:  a) IELTS Listening and CDs and question sheets. b) Descriptive Writing handout.

Procedures:

1. LISTENING (45m)
   • T plays recordings for Ss and gets Ss to practice section by section.
   • T them tackles the areas of difficulties where most Ss have problems.

2. WRITING (Descriptive) (50m)
   • T provides an introduction on Descriptive writing.
   • T explains the various aspects on descriptive writing, the reference structure, the verbs to use etc.

Reminder:
Introduce Project Work. Get Ss to submit choice of topics by 2/8 (Friday) and group members.
T will email a guideline on PW framework.

1. Topic submission for approval & Group members     August 2
2. Framework & recommended measures to be submitted for approval     August 16
3. Completed work                                     September 6
4. Display board                                      September
   11
IELTS Writing Task 1 Guidelines

Understanding Writing Task 1

Writing Task 1 is designed to test your ability to interpret and present information that is given in short form, often as data within a diagram, graph, chart or table. You must present the information in your own words as complete sentences within paragraphs, that is, not in note form unless specifically requested. The minimum number of words you are required to write is 150. You are not asked to give opinions, make assumptions, or draw conclusions about the information given.

The information may be presented to you in a number of ways, for instance, as:

- A graph
- A bar or pie chart
- A table of information
- A diagram of the stages of a process or procedure
- A sequence of events
- A picture of an object showing how it works

There might be a combination of graphs, tables and charts, and you may be asked to compare the information given. Sometimes, however, even when the question does not specifically ask you to compare information, you will probably find it necessary to do so. Remember to compare the information shown, if it helps you with your description.

Alternatively, you may be asked to use the information given to support a written statement. First of all, you must fully understand the task and what you are asked to do. Spend a minute or two working out what it is you are looking at, and what information you must give.

Plan the Number of Paragraphs

Once you have read the task carefully and you are sure of what to do, you need to plan your answer. Since you have only 20 minutes to complete the task, you do not have time to write a detailed plan on paper. Instead, you should look for the main features of the diagram, table, chart, process, etc. This will assist you to determine the number of paragraphs to write before you begin.

Look at the model answer for Task 1 of Writing Test One (IELTS 7, Page 53)
Writing Task 1

The graph below shows the consumption of fish and some different kinds of meat in a European country between 1979 and 2004.

Summarise the information by selecting and reporting the main features, and make comparisons where relevant.

Write at least 150 words.

To begin with, you will need an introductory paragraph describing the graph. Then you should note the breakdown of the information presented. You could either write 4 body paragraphs according to the line graphs (Chicken, Beef, Lamb and Fish), and ensure that you roughly work this out before you begin to write. Note that you do not need a ‘separate’ conclusion for Writing Task 1.
You should also decide what the **main topic** of each paragraph will be before you write. In general, you should aim to write a total of between 3 and 5 paragraphs for Writing Task 1.

The model answer for Task 1 of Writing Test One is written in 4 paragraphs:

- **Paragraph 1** - The introduction
- **Paragraph 2** - The consumption of the 4 types of meat in the early years
- **Paragraph 3** - The consumption of the 4 types of meat throughout the 25 years
- **Paragraph 4** - The consumption of the most popular meat & conclusion OR
- **Paragraph 5** - Conclusion

Sometimes, it is a good idea to join together the introduction and the first body paragraph, but only in Writing Task 1. If there is quite a lot of information to include in your answer, you might not be able to complete the task in 20 minutes if you write a long introduction. However, an introduction that is too short, for instance, a single short sentence, will not work as a paragraph. Similarly, you might need to **join paragraphs** that contain more than one main idea, but only do this in Writing Task 1.

Remember: Plan the number of paragraphs before you begin, by noting the main features of the data within the diagram, graph, chart, etc.

**Use „Reference” Structures**

When referring to a diagram, chart, table, etc. use „reference” structures such as those given below. This will assist the reader to know where your information comes from, and will effectively lead in to what you have to say.

<table>
<thead>
<tr>
<th>The table/chart diagram graph</th>
<th>shows (that)…</th>
<th>According to the As (is) shown in the As can be seen from the</th>
<th>table/chart, diagram, graph, figures</th>
<th>…</th>
</tr>
</thead>
<tbody>
<tr>
<td>figures statistics diagram</td>
<td>show (that)…</td>
<td>It can be seen from the We can see from the It is clear from the It is apparent from the</td>
<td>table/chart diagram graph figures</td>
<td>(that)…</td>
</tr>
<tr>
<td>shows how describes how illustrates how</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Be careful not to use these „reference” structures too frequently to avoid unnecessary repetition.

**Write a Descriptive Introduction 1**

All Writing Task answers require an introduction, which should begin with a **topic sentence**. The topic sentence of the introduction is a general statement that explains what it is that is being described in the task. Imagine that the reader does not have the task in front of him or her. You must tell the reader in words what you see.

Look at the introduction to the model answer for Task 1 of Writing Test One:
The graph illustrates changes in the amounts of beef, lamb, chicken and fish consumed in a particular European country between 1979 and 2004.

The general statement (topic sentence) of the introduction is shown in bold print. It tells the reader the information of the line graph and that shows the amount of fish and meat consumption. This sentence is informative, and gives a clear indication of what the reader needs to know to understand the rest of your written work.

**Important note:** One problem is that a suitable general statement may already be given as part of the question. In that case do not copy the sentence word for word. Instead, you should either rearrange the words to say what has been said in a slightly different way, and/or give additional information.

The next sentence describes how the writer has decided to group the information, and gives an idea of how the body of the piece of writing is constructed. The effect is similar to a „map”, which provides the reader with a sense of direction. The reader knows that the next paragraph will describe the early consumption of each kind of meat, and fish, and the paragraph after that will describe, and compare the consumption of each kind of meat throughout the 25 years.

The next paragraph should focus on the highest kind of meat consumed, which is chicken, followed by a conclusion.

**Present Statistics Effectively**

If you are asked to organize and present data in your answer, you will need to include the given statistics in an effective manner. You may also be asked to compare statistical data. You may present them

… as numbers expressed in word („twice the profit”, „three-fold”, etc.)
… as numbers listed in the order mentioned using the word „respectively”

<table>
<thead>
<tr>
<th>Statistics are often expressed in percentages:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The EEC and the USA both had 10%.</td>
</tr>
<tr>
<td>The profit rose to 10%.</td>
</tr>
<tr>
<td>The monthly profit increased by 10%</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Slovakia had the largest percentage of students</td>
</tr>
<tr>
<td>Slovakia had 10% of the students.</td>
</tr>
<tr>
<td>10% of the students were from the Federation of Russia.</td>
</tr>
<tr>
<td>France accounted for 10% of the students.</td>
</tr>
<tr>
<td>They made twice the profit percentage of profit in May than in March.</td>
</tr>
<tr>
<td>The profit percentage doubled from March to May.</td>
</tr>
</tbody>
</table>
Company A’s profit percentage rose steadily, whereas that of Company B fell slightly. There were more males than females (10% and 5% respectively).

Note also the following structures for presenting numbers and statistical data:

<table>
<thead>
<tr>
<th>School A has</th>
<th>almost/nearly approximately about just over over</th>
<th>a/one quarter of a/one third of a/one half of three quarters of</th>
<th>the (total) number of students.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>almost/nearly approximately about just over over</td>
<td>a quarter half three quarters twice three times</td>
<td>as many students as much space</td>
</tr>
<tr>
<td></td>
<td>as many (students) as as much (space) as School B.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Express Changes in Data Effectively

If Writing Task 1 is a graph, table or chart, you should notice first if the information is fixed in time or changes over time. If the information changes over time, you need to express those changes by using words and phrases which describe how it has changed.

The figures given can either increase or decrease, fluctuate, or remain stable (stay the same). Increases, decreases and fluctuations can be expressed in either of two grammatical ways:

- Verb + adverb form
- Adjective + noun form
Look at the following table:

<table>
<thead>
<tr>
<th>The number of (cars)</th>
<th>increased</th>
<th>suddenly</th>
<th>from (June) to (December).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>jumped*</td>
<td>rapidly</td>
<td>between (June) and</td>
</tr>
<tr>
<td></td>
<td>rose</td>
<td>dramatically</td>
<td>(December).</td>
</tr>
<tr>
<td></td>
<td>decreased</td>
<td>significantly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dropped</td>
<td>sharply°</td>
<td></td>
</tr>
<tr>
<td></td>
<td>fell</td>
<td>steeply°°</td>
<td></td>
</tr>
<tr>
<td></td>
<td>fluctuated*°</td>
<td>steadily*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>gradually*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>slowly*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>slightly</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>from (June) to (December).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>between (June) and (December).</td>
<td></td>
</tr>
</tbody>
</table>

| There was a (very) | sudden            | increase          | In the consumption of chicken |
|--------------------|-------------------|-------------------| in the number of (cars).    |
|                    | rapid             | jump*             | from… to… .                 |
|                    | dramatic          | rise              | between… and… .             |
|                    | significant       | decrease          |                          |
|                    | sharp°            | drop              |                          |
|                    | steep°            | fall              |                          |
|                    | steady*           | fluctuation*°     |                          |
|                    | gradual*          |                   |                          |
|                    | slow*             |                   |                          |
|                    | slight            |                   |                          |

*° Note that not all of the word combinations are possible.

Little or no change can be expressed in the following way:

<table>
<thead>
<tr>
<th>The number of fish consumption levels</th>
<th>remained</th>
<th>steady</th>
<th>from (June) to (December).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>stayed the same</td>
<td>stable</td>
<td>between (June) and (December).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Although it remained the least popular food.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>There was</th>
<th>little</th>
<th>change</th>
<th>from… to… .</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>hardly any</td>
<td>in the number of (cars sold)</td>
<td>between… and… .</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Notice how the words and phrases for expressing data changing with time apply to a graph:

Look at the following graphical detail taken from Task 1 of Writing Test Four:

![Graphical Detail](image)

The situation at the highest and lowest points of a graph can be expressed in the following way:

<table>
<thead>
<tr>
<th>The monthly profit</th>
<th>peaked</th>
</tr>
</thead>
<tbody>
<tr>
<td>The figures</td>
<td>reached a peak/a high (point) in (December).</td>
</tr>
<tr>
<td>The situation</td>
<td>bottomed out</td>
</tr>
<tr>
<td></td>
<td>reached rock bottom/the bottom/a low (point) at (20%).</td>
</tr>
<tr>
<td></td>
<td>hit a trough</td>
</tr>
</tbody>
</table>

Use the Correct Tense/Voice

It is important to use the correct grammatical tense or voice each time you use a verb. If the Writing Task is a process or procedure, use the present tense and the passive voice to describe the steps or stages. You can also use the gerund form of the verb (the “-ing” form used as a noun), and the infinitive with “to” construction after “it is necessary” and “it is important” etc.

Do Not Add a „Separate“ Conclusion

There is no need to write a „separate“ conclusion as you must do in Writing Task 2. This is because you are not being asked to conclude an argument, or evaluate your discussion of a topic, as in Writing Task 2. **Remember, your opinions are not required in Writing Task 1.**

Try to do so by giving more detail, and not by giving opinions.

Sample:

Overall, the graph shows how the consumption of chicken increased dramatically while the popularity of these other foods decreased over the years.

**In Writing Task 1, your personal opinions about the topic are irrelevant.**
HOMEWORK: **WRITING TASK 1**

You should spend about 20 minutes on this task.

*The graph below shows the proportion of the population aged 65 and over between 1940 and 2040 in three different countries.*

*Summarize the information by selecting and reporting the main features, and make comparisons where relevant.*

Write at least 150 words.
APPENDIX J – Teacher 1

Round Table Guidelines
for Moderators and Panel Members

The Round Table Format

Round Tables are highly interactive. They reflect a wide range of points of view and seek to bring all parties to the table in a major discussion format. The actual size of the audience ranges from 100-500 participants but for our roundtable, we may have some sit-in guests. Sessions are for the entire 2-hour period, including as much time as possible for questions from the audience. The timetable should be strictly adhered to.

Opening remarks are brief in order to allow maximum time for audience participation. Each panelist speaks for a maximum of three minutes to lay out the issues. There is ample time for speakers to elaborate on their views when they are called upon by the Moderator and audience.

Speakers are encouraged to highlight specific examples or case studies relevant to the topic of the Round Table. Speakers” introductory remarks should be brief, and challenge the audience with new and provocative ideas.

The Role of the Moderator

Opening the session: The Moderator introduces the panelists and the main themes of the session and reminds the audience that there will be time for questions during the Round Table. He/she lays the ground rules for the session, including setting the time limits for remarks by the speakers, reminding participants to identify themselves before posing brief and concise questions and directing the questions and answers.

Moderating the session: The Moderator ensures that the discussion among the panelists and with the audience is dynamic and focused. He/she ensures that the time limits for speakers and questioners are respected. Once the panel has made their opening remarks, the Moderator will then take 1-2 minutes to summarize these positions. If questions are not readily forthcoming from the audience, the Moderator is prepared to ask a leading question to generate discussion.

Closing the session: The Moderator plans the overall timing of the session in order to close on time. It is essential not to overrun the allotted time because the room must be set up for the next session. The Moderator concludes the session with a short 1 minute summary of the key points made during the discussion and Q&A.

Rules:

- Each panelist is allowed 2 minutes to present their views. So that means even if you are working in pairs, you still have that allocated 2 minutes each.
Stick to your time, the moderator will be the timekeeper as well as to ensure that you abide to the rules.

Everyone is requested to at least ask 1 question. (You will be marked on participation)

Panelist

As a panelist, your 2-minutes include the following:

1. State who you are and where you are from. (eg. not XXX of MWITS, but XXX, the Minister of Education etc.) Role-play who you are well. (This involves serious and focused acting)
2. Your views on the topic, based on facts (where possible) for eg. the minimum working age for children is … state the fact, don’t increase the age on your own, from a case that happened etc, on statistics.
3. In some cases, you need to be imaginative and creative to fight your case.

Audience role: To express your opinion on the issue, suggest a solution/s where possible, asks questions to those members of the panel that you disagree with or points that you need clarification during the Q&A time.

Moderator

As a moderator you must open the floor, which means you need to introduce the panelists and the roundtable topic.

1. You then state the time limit for each panelist and introduce the 1st speaker etc. and so on.
2. Once any panelists exceed the time, or you know may not finish on time, interrupt gently and note to the panelist how much time he/she has remaining.
3. Keep to the time strictly. Once each panelist has spoken, introduce the other.
4. Questions/clarifications are allowed only after everyone on the panel has spoken. As a moderator, you need to have a set of back-up questions ready if there are no questions from members of the audience and other panelists.

Lastly, BE ORIGINAL in your thinking, don’t stick to the norms, or what you have read but real creative and never-thought before solutions!! Important reminder: This is an academic work, so be serious, focused and ROLE PLAY your parts well.

Good Luck.
Roundtable Topics

1. Child Labor: Should the minimum legal working age for children in Thailand be lowered, and without conditions, given the consent from parents?

Panelists:

For: President of Federation of Thai Industries (Ice/Pek), Very poor parents (Vee/Rung);

Against: Minister of Education (Oon) ; NGOs for Children Foundation: (Kodomo, Tul)

Moderator: PP (Total time: approx. 25 mins)

2. Social: Everyone knows that Thailand will benefit economically from having a casino, what’s stopping us?

Panelists:

For: Prime Minister of Thailand (PP/Po); Gambler (Boss); Ordinary Citizen (Tod/Prem)

Against: Religious Leaders (Nink - Christian Priest, Klam -Buddhist Monk) ; Social Critic (Nut)

Moderator: Pek (Total time: approx. 30 mins)

3: Social: Is euthanasia humane? Do we have the right to put an end to the life of our loved ones?

Panelists:

For: The patient’s gay life partner (Jatucom), Doctor (Pong)

Against: Religious leader (Christian Priest: Bomb), Doctor (Arm Sorawit), Patient’s female best friend (Puan)

Moderator: Tul (Total time: approx. 20 mins)

Note: The patient is a male
APPENDIX K - Teacher 2

Class Activity 3

Student Name: Student ID

Plant Growth

Plants grow in two stages; primary growth and secondary growth but monocotyledon has only a primary growth.

Objective

1. Students will be able to explain the growth stages of plants

Instructions: Please draw a diagram depicting the growth stages of plants

<table>
<thead>
<tr>
<th>Growth Stage</th>
<th>Vocabulary</th>
<th>Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary growth</td>
<td>Protoderm, ground meristem, procambium</td>
<td></td>
</tr>
<tr>
<td>Epidermis</td>
<td>Endodermis</td>
<td></td>
</tr>
<tr>
<td>Pericycle</td>
<td>Ground tissue</td>
<td></td>
</tr>
<tr>
<td>Ground tissue</td>
<td>Vascular tissue</td>
<td></td>
</tr>
<tr>
<td>Cortex</td>
<td>Stele</td>
<td></td>
</tr>
<tr>
<td>Stele</td>
<td>Primary xylem</td>
<td></td>
</tr>
<tr>
<td>Primary phloem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth Stage</td>
<td>Vocabulary</td>
<td>Diagram</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Secondary growth</td>
<td>Secondary xylem, Secondary phloem, Cork, vascular cambium, cork cambium, Phelloderm, periderm</td>
<td></td>
</tr>
</tbody>
</table>

**Dicotyledon Stem**

<table>
<thead>
<tr>
<th>Growth Stage</th>
<th>Vocabulary</th>
<th>Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary growth</td>
<td>Protoderm, ground meristem, procambium</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Epidermis, ground tissue, vascular tissue, pith, cortex, stele, primary xylem, primary phloem</td>
<td></td>
</tr>
<tr>
<td>Growth Stage</td>
<td>Vocabulary</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Secondary Growth</td>
<td>Secondary xylem, Secondary phloem, Cork, vascular cambium, cork cambium, Phelloderm, periderm</td>
<td></td>
</tr>
</tbody>
</table>

Diagram: Circle representing a growth stage with labeled parts.
APPENDIX L - Teacher 2

Class Activity 11

Structure and Type of Fruits (Please read Campbell, page 856)

1. Please examine the structure of the various fruits and draw the structure and its relevant fruit parts.

Student’s note: Please examine the fruit key and their distinguishing features. Also, please draw the structure and name their relevant parts.

Fruits - Key

1. Fruits that develop from a cluster of flowers that are closely and tightly formed…. multiple fruit.

1. Fruits that develop from a single flower

2. From many carpel that are derived independently ….aggregate fruit.

2. From a single carpel or many carpel that are formed together……simple fruit

3. Fleshy Fruit

4. Fruit flesh which is not pericarp because it is not developed from the ovary wall.

Pericarp is the flesh of the ripened fruit……………………pome

4. The flesh is pericarp

5. pericarp is clearly divided into 3 layers. Endocarp is hard with a single pit or stone…drupe

5. pericarp that is not clearly divided into 3 layers. Endocarp is not hard, with many pits.

6. exocarp with oil gland……hesperidium

6. exocarp without oil gland

7. exocarp with hard or leathery rind ………pepo

7. exocarp which is not hard or leathery ……berry
<table>
<thead>
<tr>
<th>Multiple Fruit</th>
<th>Aggregate Fruit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of fruit ……………</td>
<td>Name of fruit ……………</td>
</tr>
<tr>
<td>Pome</td>
<td>Drupe</td>
</tr>
<tr>
<td>Name of fruit ……………</td>
<td>Name of fruit ……………</td>
</tr>
<tr>
<td>Number of carpel ……………</td>
<td>Number of carpel ……………</td>
</tr>
<tr>
<td>Number of locule ……………</td>
<td>Number of locule ……………</td>
</tr>
<tr>
<td>Hesperidium</td>
<td>Pepo</td>
</tr>
<tr>
<td>Name of fruit ……………</td>
<td>Name of fruit ……………</td>
</tr>
<tr>
<td>Number of carpel ……………</td>
<td>Number of carpel ……………</td>
</tr>
<tr>
<td>Number of locule ……………</td>
<td>Number of locule ……………</td>
</tr>
</tbody>
</table>
APPENDIX M – Teacher 3

Science Writing Heuristic

**Topic** The effect of temperature on exothermic and endothermic reaction rate

Group members (please locate your name at the first)

_____________________________
_____________________________

1. **Beginning ideas - What are my questions?**

Does temperature have an effect on endothermic and exothermic reaction rate?

2. **Tests - What did I do?**

**First Experiment**

1. Fill 5 ml. of Hydrogen Peroxide and 5 ml. of detergent in a test tube.
2. Take the temperature in the test tube.
3. Add 5 ml. of KI in the test tube.
4. Count time when start add KI in the test tube and stop time when the gas in the test tube stream to the top of the test tube.
5. Doing it again but change temperature of substance to high temperature and low temperature.
6. Observer, take the temperature and save the results.

**Second Experiment**

1. Fill 10 ml. of Sodium bicarbonate.
2. Take the temperature in the test tube.
3. Add 10 ml. of Citric acid then use Carbon dioxide detector to taking the temperature in the test tube for 10 second. (average 8-12 sec.)
4. Doing it again but change temperature of substance to high temperature and low temperature.
5. Observer, take the temperature and save the results.
Lesson Plan No. 1 Subject Scientific Inquiry and the Nature of Science Sci30291
Grade 10 Second semester Academic Year 2012
Topic Introduction to Scientific Inquiry Time 5 Periods

1. Concept

Science is a way of learning about the natural world. Science also includes all the knowledge gained by exploring the natural world. Scientists use skills such as observing, inferring, predicting, classifying, evaluating, and making models to study the world. Scientific inquiry usually refers to the diverse ways in which scientists study the natural world and propose explanations based on the evidence they gather.

2. Learning Outcome

2.1 Students understand what is science also could give the examples of science.

2.2 Students understand the meaning of scientific inquiry and realize how it important.
3. Objective
Content objectives:
3.1 Students could explain and give example of the process of science.
3.2 Students could explain and give example of scientific inquiry.
3.3 Students could illustrate the importance of science and scientific inquiry.

Behavioral/Performance Objectives:
Use inquiry method to understand the learning objects:
3.4 Ask questions.
3.5 Make meaning through investigation, discussion, research, and reflection from multiple sources.
3.6 Apply critical thinking skill to analyze and synthesize evidence and information while investigating questions.
3.7 Design, conduct, and report the findings of scientific investigation while using oral, graphic.
3.8 Demonstrate an understanding of science processes and science content as well as the ability to apply them to everyday situation.

4. Content
Science is a way of learning about the natural world. Science also includes all the knowledge gained by exploring the natural world. Scientists use skills such as observing, inferring, predicting, classifying, evaluating, and making models to study the world.

Observing means using one or more of your senses to gather information. It also means using tools to help your senses. A quantitative observation deals with numbers, or amounts. A qualitative observation deals with descriptions that cannot be expressed in numbers.

When you explain or interpret the things you observe, you are inferring, or making an inference. Inferences are based on reasoning from what you already know. Predicting means making a statement or claim about what will happen in the future based on past experience or evidence. Predictions and inferences are closely related. While inferences are attempts to explain what is happening or has happened, predictions are statements of claims about what will happen.

Classifying is the grouping together of items that are alike in some way. Evaluating involves comparing observations and data to reach a conclusion about them.

Making models involves creating representations of complex objects or processes. Some models can be touched,
such as a map. Others are in the form of mathematical equations or computer programs. Model help people study things that cannot be observed directly.

**Scientific Inquiry**

Thinking and questioning is the start of a **scientific Inquiry** process. Scientific inquiry refers to the diverse ways in which scientists study the natural world and propose explanations based on the evidence they gather. Scientific inquiry often begins with a **question** about an **observation**. In trying to answer a question, you are developing a **hypothesis**. A hypothesis is a possible answer to a scientific question.

After developing a hypothesis, we are ready to test it by designing an **experiment**. An experiment must follow sound scientific principles for its result to be valid.

**Variables** are the factors that can change in an experiment. The one variable that is purposely changed to test a hypothesis is the **manipulated variable**, or independent variable. The factor that may change in response to the manipulated variable is the **responding variable**, or dependent variable. All other variables must be kept the same. An experiment in which only one variable
is manipulated at a time is called a **controlled experiment**. In any experiment there is risk of introducing bias.

**Data** are facts, figures, and other evidence gathered through qualitative and quantitative observations. After data have been collected, they need to be interpreted. Then you can draw **conclusions** about your hypothesis. A conclusion is a summary of what you have learned in an experiment.

**Communicating** is the sharing of ideas and results with others through writing and speaking. Scientists communicate by giving talks at scientific meeting, exchanging information on the internet, or publishing articles in scientific journals.

4. Activity (5 E Inquiry model)

4.1 Engage and Explore

To teach this lesson with an emphasis on inquiry, begin with the Inquiry Warm-Up activity by using the “What is Science?” worksheet.

After the Inquiry warm-up worksheet, students will design and conduct a scientific experiment on fruit cell. Focus on the Inquiry skill for the lesson. Teachers show how to create electric current by using coins and fruit. Students make observation about those
two experiments and they are asked to post a question about their observation. Lead a discussion for helping student set their hypothesis. Then students are asked to explore their answers which related to their hypothesis.

4.2 Explain
Explain to students that one way scientists test a hypothesis is by designing and conducting experiments according to certain principles. By following these principles, they and other scientists can trust that the results of the experiment prove or disprove a hypothesis. After students finish their investigation, call on volunteers to share their experiments, results and their conclusion with whole class.

4.3 Elaborate
Let students study about the misconception of falling objects; heavier objects fall faster than lighter ones. Then they were asked to explain why this statement is not true by using scientific inquiry skill.

4.4 Evaluation
After students finish those activities, have them evaluate their understanding by completing the examination.

6. Instructions
6.1 “What is Science?” worksheet.
6.2 Coin cell experiment
6.3 Fruit cell experiment
6.4 Students’ experiments (6 experiments / class)
6.5 Evaluation worksheet

7. Assessment
7.1 Assessment process
Observation
- Students’ discussion
- Students’ inquiry skills
7.2 Assessment tool
Students’ worksheets
Observation list
7.3 Criteria
Students have their score more than 60%

8. Teachers’ note (after class)

………………………………………………………………………………………………………………
………………………………………………………………………………………………………………
9. Comment and Suggestion
Activity Sheet

What is Science?

From http://bowshooter.blogspot.com/2011/02/nasa-iss-camera-club-meeting.html

NASA studies how microgravity, or very little gravity, affects humans, plants, crystals, and liquids. For example, NASA has found that the muscles and bones of astronauts weaken during space missions. Plants grow in different directions, crystals grow larger, and water does not pour as it would on Earth, but falls out in spheres.

What other ideas might NASA study in space?

What might an astronaut record in space using camera?
What other instruments might they use?

What questions would you like answered about space?

Science or learning about the natural world is a process that includes posing questions and gathering evidence.

Appendix O– Teacher 4

Experiment: Transpiration and Leaf Surface Area

Introduction
In any plant growth development, transpiration is essential to reduce the temperature of leaves as well as allowing the roots to draw water and nutrients. Transpiration rates of plants vary widely depending on type of plant and the environment. Transpiration of plants can be measured if the leaf surface area is the same regardless of the plant species.

Objective
1. To study the transpiration differences of upper and lower leaf surface.
2. To study the transpiration differences of plants growing in shade and plants that
receives direct sunlight.
3. To understand the relationship between transpiration and leaf surface area.

**Materials and Tools**

1. Leaf
2. Tweezers
3. Clothes - pegs (2pcs)
4. Cobalt-chloride paper
5. Microscope slide (2 pcs)
6. Planimeter ruler

**Experiment Procedure**

Compare transpiration rates of plants growing in shade and plants receiving direct sunlight.

Conduct an experiment the transpiration rate of the leave that grow in shade using the cobalt-chloride paper. The conditions when dry will result in a blue color but if moist, will result in a pink color. Please use the tweezers to pick the cobalt-chloride paper from the bottle and place it on the upper surface (upper epidermis) of the leaf (see picture 1). Then place the slide on the cobalt-chloride and another slide under the leaf (lower epidermis). (see picture 1) Now, use the clothes-pegs to clip both the slides.

![Diagram](image)

Picture 1: The experiment to determine the transpiration of plant using cobalt-chloride paper

Note: Please do not remove the leaf from the stem during the experiment

1. Please time the color-change effect of the cobalt-chloride paper from blue to pink. Please record the results in the table below.
2. Please record the transpiration rate of the lower epidermis in the table below.
3. Please record the transpiration rate of the leaf that receives direct sunlight, both the upper and lower epidermis, by using the cobalt-chloride paper.
Experiment Results
Name of Plant .................................

<table>
<thead>
<tr>
<th>Leaf</th>
<th>Time used in color-change from blue-pink (mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Plant in Shade</td>
</tr>
<tr>
<td></td>
<td>Upper epidermis</td>
</tr>
<tr>
<td>Leaf 1</td>
<td></td>
</tr>
<tr>
<td>Leaf 2</td>
<td></td>
</tr>
<tr>
<td>Leaf 3</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
</tr>
</tbody>
</table>

Discussion and Findings

Post-experiment questions
1. Is there a difference in the transpiration rate of upper epidermis and lower epidermis of the plant in shade and plant in direct sunlight? If yes, why?

2. Which leaf surface area experience a higher rate of transpiration and why?

3. Please explain if the method of placing the cobalt-chloride on the same leaf, but in different positions has an effect on the experiment results?

Reference : คณาจารย์ภาควิชาพฤกษศาสตร์. 2549. ปฏิบัติการพฤกษศาสตร์ทั่วไป. สานักพิมพ์มหาวิทยาลัยเกษตรศาสตร์, กรุงเทพฯ.
วันเพ็ญ ภูติจันทร์. 2548. สรีรวิทยาทั่วไป. สานักพิมพ์โอเดียนสตรอ, กรุงเทพฯ.
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Appendix P – Teacher 4

Adapted in November, 2013. Biology Department, Principle Techniques for Biology Research

In-Class Task
Students were taught how to extract sodium from plants in which they were grown under salt stress conditions.
**Homework**  
Group Activity (5 points)

Please carry out a research by reading journal articles on mineral elements or other heavy metal that are not sodium or potassium. At least no more than two types of minerals or heavy metal can be chosen, and briefly explain the following:

1. How did you extract your chosen mineral or heavy metal from the plants?  
2. Briefly explain in your analysis, what instrument was used?

Please submit your report with the journal article attached as reference. Groups that do not attach the journal article will receive no marks.

Submission deadline: Thursday, February 13, 2014, no later than 16:00 hours.

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**Appendix Q – Teacher 4 & 5**
• **Leak (v/n)** = (of a liquid or gas) to escape from a hole or crack in a pipe or container or (of a container) to allow liquid or gas to escape

• **Spill (v)** = to (cause to) flow, move, fall, or spread over the edge or outside the limit of something

  (n) = an amount of something that has come out of a container

• **Pipeline (n)** = a very long large tube, often underground, through which liquid or gas can flow for long distances

• **Offshore (adj)** = away from or at a distance from the coast

**What do see from the pictures?**
• Disaster (n) = (an event that results in) great harm, damage, or death, or serious difficulty:
• Evacuate (v) = to move people from a dangerous place to somewhere safe
• Latest (n/adj) = the most recent news or technical development
• Underestimate (v/n) = to fail to guess or understand the real cost, size, difficulty, etc. of something

around/round the clock (idiom) = all day and all night

Doctors and nurses worked around the clock to help the people injured in the train crash. This station broadcasts news round the clock.

Watching vdo from the websites
http://www.youtube.com/watch?v=T5EfsuYrx2Y
http://www.youtube.com/watch?v=s7g4tMIIcmk
http://www.youtube.com/watch?v=UfiwO7ZIFlk
http://www.youtube.com/watch?v=J4w7ceKNRd8
http://www.youtube.com/watch?v=7UVYWycwsh8
http://www.youtube.com/watch?v=Ttn7LEKexzs
(only from 1.31-8.59)
Is this incident a natural phenomenon?
GROUP ACTIVITIES

1. Searching more information on oil spill in Thailand

2. Taking note on your notebooks (individual):
   - What are the causes of the incidence/disaster?
   - What are your solutions?
   - What are the effects of oil spill?

3. Presenting in front of the class (with ppt)
Activity: Motion and Measurements

Learning Process

1. How to Build Interest

Get students to share their ideas about quantities that are related to motion, as well as to explain how each quantity is related.

2. Stages in Exploring and Discovering

2.1 Teacher will lead with discussions on distance and displacement, and highlight them with examples. Teacher will then explain the method used to calculate displacement by vector quantity.

2.2 Teacher will conduct a demonstration on how to measure velocity using a time-measurement tool. This is to enable students to observe the relationship between displacement and velocity.

2.3 Students are then given an opportunity to conduct an experiment on motion of free falling objects. Prior to that, teacher will provide some explanation on the experiment procedures as well as, provide suggestions on how to use the apparatus.

3. Discussions and Conclusion

3.1 Teacher opens the floor for class discussions on students’ findings, and allows students to make meaningful conclusions on the average rate of change of velocity, rate of change of velocity at a point, velocity and velocity at a point.

3.2 Teacher then continues to explain on acceleration, along with examples on how to calculate acceleration. Students are then asked to bring their findings to discuss, and come to a conclusion that the earth’s acceleration due to gravity is approximately at 9.8 m / s^2.
4. Knowledge Extension

4.1 Teacher gives students knowledge on the relationship between displacement and velocity using integral methods along with some calculation examples.

4.2 Teacher gets students to discuss a scenario where students are on another planet. Students are asked to investigate if the acceleration will have the same value as if there were on earth.

4.2. Get students to examine a graph and come up with ideas on which quantity we are able to find from the graph. The graph illustrates the relationship between displacement, velocity, acceleration and time.

4.3. Teacher and students discuss the gradient of the graph, between displacement, velocity and time under three conditions: motion without acceleration; constant acceleration; and non-constant acceleration.

4.4. Teacher leads a discussion with students about the area under the graph obtained from graph between velocity, acceleration and time, under three conditions: motion without acceleration, constant acceleration, and non-constant acceleration.

4.5. Teacher gets students to examine the graph on displacement, velocity, acceleration against time; under different types of acceleration.
BIOGRAPHY

Jane Kanjanaphoomin completed her undergraduate degree in Finance in 1990 from Massey University, New Zealand. In 2004, she obtained a Masters of Arts in English Language Teaching from Assumption University, Bangkok. Jane was the first recipient of the graduate school to receive the President’s Award for academic excellence. Besides that, she has extensive work experience in the private sector, having been a financial analyst at Hewlett-Packard, Singapore, a banker at ABN-Amro/Bank of Asia, Thailand; and an editor-in-chief of a premium lifestyle magazine. Her last position was Vice President for Nation Multimedia Group, prior to pursuing her passion in teaching.

Jane is currently an English Teacher at Mahidol Wittayanusorn School, Thailand’s only national high school for the gifted. Prior to this, she held dual positions as an International Relations Specialist and an English Teacher at the same school for three years.