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Phillip Hallinger and Moosung Lee

Abstract

Over the past two decades a growing body of international research suggests that instructional leadership from the principal is essential for the improvement of teaching and learning in schools. However, in many parts of the world, the practice of instructional leadership remains both poorly understood and outside the main job description of the principal. Thus, in many nations, the expectation for principals to act as instructional leaders represents a major change from traditional practice. The current study explores the principal's changing role as an instructional leader in Thailand, where education reforms adopted in 1999 sought to change modal approaches to teaching and learning as well as school management. The study employed surveys of principal instructional leadership conducted prior to and following adoption of Thailand's National Education Act 1999 to assess change in principal practice. The results suggest that despite new system expectations for principal to act as instructional leaders, the predominant orientation of Thai principals remains largely unchanged. The authors recommend that more systematic and substantial steps are needed to train and support principals in making this change in their role.

Keywords

education reforms, instructional leadership, schools leadership, Thailand

Introduction

Mirroring a global trend, the past 20 years have been a period of active education reform in South-east Asia (Cheng and Walker, 2008; Hallinger, 2011a, 2011b). Regional reforms focused first on expanding access to 12 years of free public schooling, and then on improving educational quality (Carnoy, 2003; Hallinger, 2010; Pennington, 1999; Sangnapaboworn, 2007). The underlying rationale for education reforms undertaken during this era was articulated by Kriengsak Charoenwong-sak, a policy analyst in Thailand.

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If the trends [in enrolment and retention of primary and secondary school graduates] continued the number of secondary school graduates would double by 2002 . . . However, increasing the quality of Thai products also involves improving the quality of education. The current emphasis on rote learning does not help students assume positions in the workplace which stresses problem-solving and other analytical skills. (*Bangkok Post*, 1998: 2)

Improving educational quality would, however, require substantial change in the modal practices of teaching and learning, not only in Thailand but also throughout the region (Cheng and Walker, 2008; Chuwattanukul, 2001; Sangnapaboworn, 2007). In order to accomplish these changes, government policymakers recognized that capable leadership would be needed. The Prime Minister of Thailand, Chuan Leekpai, made this explicit in 1992.

The big problem [in the Thai educational system] is the quality of education. Educational administrators must realize that when compulsory education is extended from six to nine years, the quality of education must not remain as it was before. Quality does not depend on budget . . . More important is the extent to which administrators are dedicated to improving quality. (*Bangkok Post*, 1992: 1)

This statement, however, reflected the *aspirations* of policymakers for educational leadership and change rather than the *reality*. Consequently, in 1999 Thailand passed an ambitious National Education Act (NEA) (ONEC, 1999) designed to transform teaching, learning and educational management in Thailand's 35,000 primary and secondary schools (Fry, 2002; Kaewdaeng, 2001; Thongthew, 1999). It is notable that the conception of the reform law was not limited solely to enhancing the economic outcomes of education, but also the society's social and cultural development (Kaewdaeng, 2001). The list of policy changes implemented in Thailand over the ensuing decade would sound familiar to educators in Washington DC, London, Toronto, Sydney or Hong Kong: school-based management, educational quality assurance, student-centred learning, information and communications technology (Hallinger and Lee, 2011).

Yet, a decade after adoption of the NEA in 1999, data from several empirical studies suggest that the impact of Thailand's education reforms has fallen below the expectations of both policymakers and the public (Barron-Gutty and Chupradit, 2009; Hallinger and Lee, 2011; Mounier and Tangchuang, 2009; *The Nation*, 2010; Wiratchai et al., 2004). Numerous barriers to change have been identified, including budget allocation, teacher skills and attitudes, complexity of reforms and the mismatch between the values underlying the reforms and Thai culture (Hallinger and Lee, 2011, 2013). In light of the slow progress, scholars have increasingly questioned whether Thailand's school principals have the capacity to provide *the type of leadership* required in this new era (Boontim, 1999; Bunyamani, 2003; Gamage and Sooksomchitra, 2004; Hallinger, 2004; Hallinger and Lee, 2011; Kantabutra, 2005; Leksansern, 2006; Maxcy et al., 2010).

Admittedly, Thailand's principals have faced a huge change in system expectations with respect to their own role. Virtually overnight, in 1999, they were asked to change their primary role orientation from system management to instructional leadership (Bunyamani, 2003; Chuwattanukul, 2001; Hallinger, 2001, 2004). Subsequent research suggests that this change in role orientation and behaviour has also been slow to take hold (Boontim, 1999; Bunyamani, 2003; Gamage and Sooksomchitra, 2004; Hallinger, 2004; Hallinger and Lee, 2011, 2013). Thus, in 2008, the Secretary General of the Office of Basic Education Commission of Thailand noted the following.

The reforms we have undertaken at the national level cannot be accomplished without active involvement and leadership from our school principals. Without skillful leadership and active support from the

principal, how can teachers hope to make these changes in curriculum and teaching? But our principals need motivation as well as more skills to lead these changes in their schools. (Varavarn, 2008)

This study had two goals. The first was to map the current instructional leadership profile of principals in Thailand. This involved analysing self-report data on the instructional leadership of a large nationally representative sample of Thailand's school principals. The nature of this sample allowed us to describe patterns of instructional leadership across school levels and regions of the country.

The second goal was to assess whether the instructional leadership profile of secondary school principals has changed since adoption of the NEA (ONEC, 1999). In order to gain insight into this question, the researchers compared secondary data drawn from three studies of principal instructional leadership conducted in Thailand during the mid-1990s (Poovatanikul, 1993; Ratchaneeladdajit, 1997; Taraseina, 1993) with data collected in 2008. All four of the studies employed the Thai form of the Principal Instructional Management Rating Scale (Hallinger, 1982, 1993) for data collection, thereby enabling direct comparisons across several dimensions of the instructional leadership role.

We note that this represents one of the first attempts to develop an instructional leadership profile of principals within the educational system of an entire nation. We suggest that this represents a potentially useful and replicable contribution of the research by itself. Moreover, by mapping the pattern of principal instructional leadership practiced in Thailand prior to and following adoption of the NEA (ONEC, 1999), the research also provides benchmarks in response to policy change in the system's school-level leadership. Nonetheless, we note that our reliance on the use of secondary data to develop the pre-reform era benchmark placed limitations on our attempt to assess change in principal practice, and to link those change directly to Thailand's education reforms. Therefore, we interpret the results of the study as indicative rather than conclusive evidence with respect to the impact of the nation's reform efforts on change in principal practice (Cook and Campbell, 1979).

Theoretical Perspective

We begin this section with presentation of the conceptual frameworks that guided data collection and analysis in this study. Then we provide an overview of the institutional context of education in Thailand. Finally, we review the empirical literature on instructional leadership in Thailand.

Instructional Leadership in the Global Education Context

Two conceptual frameworks guided data collection and analysis in this research. Both conceptual frameworks originated in the USA where the concept of instructional leadership had its genesis in the mid-20th century (Bridges, 1967; Grobman and Hynes, 1956; Gross and Herriot, 1965; Lipham, 1961; Uhls, 1962). The conceptual frameworks were developed by two groups of researchers in the San Francisco Bay area during the early 1980s (Bossert Dwyer et al., 1982; Hallinger and Murphy, 1985). Both frameworks have been influential in shaping research, policy and practice in this domain during the subsequent decades (Hallinger and Heck, 1996; Leithwood et al, 2006; Louis et al., 2010; Robinson, 2006).

The Far West Lab Instructional Management Framework. Thirty years ago, researchers at the Far West Lab for Educational Research and Development in the USA (Bossert et al., 1982) sought to define instructional leadership as a researchable construct (see Figure 1). This framework explicitly grounded the exercise of principal leadership within the context of the school. Towards this end,

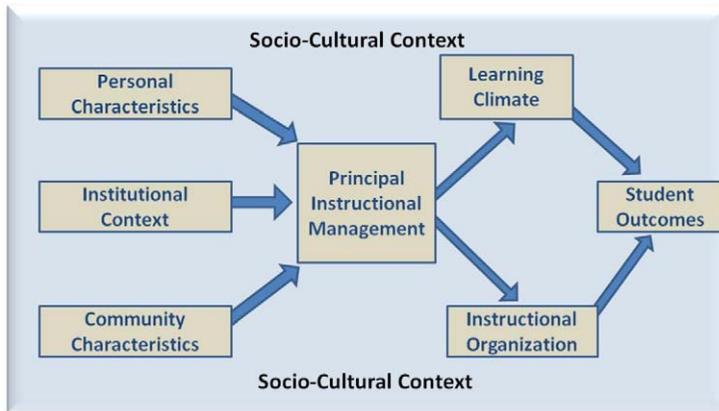


Figure 1. Instructional management role of the principal (adapted from Bossert et al., 1982).

the model includes several categories of moderating variables that were proposed to shape principal leadership practice (for example, community context, institutional context, personal characteristics). It distinguished these from mediating variables (for example, instructional organization, instructional climate) through which principal leadership was proposed to impact student outcomes.

A substantial international body of empirical research has accumulated that supports the efficacy of this framework (Hallinger, 2011a; Hallinger and Heck, 1996; Leithwood et al., 2006; Mulford and Silins, 2003; Robinson, 2006). This research yields three broad conclusions.

1. Selected personal characteristics of principals (for example, gender, efficacy, optimism, resilience) influence their approach to leadership practice (Hallinger, 2011a; Leithwood et al., 2006).
2. Features of the institutional and community context of schools shape the practice of principal leadership as well as the means by which it yields positive effects in different organizational settings (Belchetz and Leithwood, 2007; Goldring et al., 2008; Hallinger, 2011b; Hallinger and Heck, 1996; Leithwood et al., 2006; Mulford and Silins, 2003).
3. School leadership achieves its impact on student learning indirectly, by setting direction, designing the school organization, and developing people (Hallinger and Heck, 1996; Leithwood et al., 2006; Louis et al., 2010; Robinson, 2006; Mulford and Silins, 2003).

Another feature of the education context not included in the Far West Lab model, the socio-cultural environment of schools, has since received increased attention from scholars (Bajunid, 1996; Cheng, 1995; Hallinger, 1995; Hallinger and Leithwood, 1996; Walker and Dimmock, 2002). Consequently, we adapted the Bossert framework by inserting the *socio-cultural context* as an additional environmental variable that shapes the practice of school leadership (see Figure 1). We suggest that the omission of this factor from the original Far West Lab framework was a tacit indication that education scholars in the 1980s seldom considered the cross-cultural implications of their work (Bajunid, 1996; Cheng, 1995; Hallinger, 1995). During the ensuing decades, however, the globalization of education policy has revealed the shortcomings of theoretical models that did not seek to account for differences in leadership practice across different cultural settings (Hallinger and Leithwood, 1996; Walker and Dimmock, 2002). This has led to the emergence of empirical

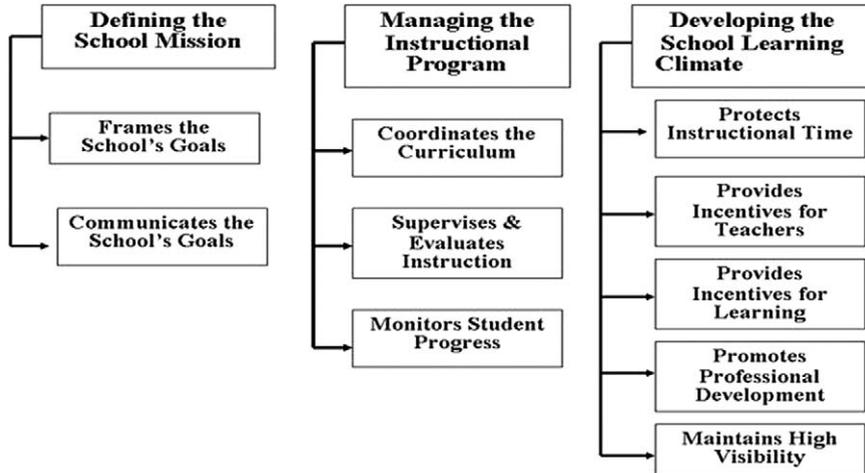


Figure 2. PIMRS conceptual framework.

research into the enactment of school leadership in a more diverse set of socio-cultural contexts (Ashkenasy, 2002; Leithwood and Day, 2007; Kantabutra, 2005; Lee and Hallinger, 2012; Hallinger, 2011b). The current study contributes to this line of inquiry into educational leadership outside of mainstream ‘Western’ contexts (Hallinger, 2011b).

PIMRS Model of Instructional Leadership. Concurrent with the research being conducted by Bossert’s team at the Far West Lab, Hallinger and Murphy (1985) proposed a complementary model for defining and measuring the instructional leadership role of the principal. This became popularly known as the PIMRS framework after the associated instrument (that is, the Principal Instructional Management Rating Scale; Hallinger, 1982). The PIMRS model proposed three dimensions in the instructional leadership role of the principal: defining the school’s mission; managing the instructional programme; and promoting a positive school learning climate (Hallinger and Murphy, 1985). These broad dimensions were further delineated into 10 instructional leadership functions (see Figure 2).

Two functions, framing the school’s goals and communicating the school’s goals, comprised the dimension, *defining the school’s mission*. These functions concern the principal’s role in working with staff to ensure that the school has a clear mission and that the mission is focused on academic progress of its students. While this dimension does not assume that the principal defines the school’s mission alone, it does propose that the principal is responsible for ensuring that such a mission exists and is communicated widely to the school’s stakeholders.

Managing the instructional program focuses on the role of the principal in ‘managing the technical core’ of the school. This dimension incorporates three leadership functions: supervising and evaluating instruction, coordinating the curriculum and monitoring student progress. Although these instructional leadership responsibilities must be shared with teachers and other school administrators, the framework assumes that coordination and control of the academic program of the school remains a key leadership responsibility of the principal.

Promoting a positive school learning climate is broader in scope and intent than the second dimension, and overlaps with facets of transformational leadership frameworks (Hallinger, 2003; Leithwood et al., 2006). It includes several functions: protecting instructional time; promoting

professional development; maintaining high visibility; providing incentives for teachers; and providing incentives for learning. Through enactment of these functions, successful principals create an 'academic press' and a culture that fosters and rewards continuous learning and improvement.

This conceptual model and the PIMRS (Hallinger, 1982) measurement tool were widely applied in empirical studies of instructional leadership over the next three decades (Hallinger, 2011a). The PIMRS has been used in at least 22 different countries and more than 175 completed studies (Hallinger, 2011a). In the current study, the researchers employed secondary data gathered in three studies of instructional leadership in Thailand that had employed the PIMRS. We will discuss these studies in the following section.

Instructional Leadership in Thailand

In this section, we first provide an overview of the institutional context of education in Thailand. Consistent with the Far West Lab framework, we propose that the institutional context shapes the exercise of instructional leadership by principals in Thailand. More specifically, the logic behind our analytical strategy proposes that the adoption of the NEA substantially changed the institutional context for principal leadership. Thus, it is necessary to describe the nature of the institutional context in Thailand before and after the reform law was adopted in 1999. In the second section, we discuss empirical studies of instructional leadership that have been conducted in Thailand. This will set the stage for our presentation of the methodology and results.

Institutional Context

Thailand's education system has traditionally emphasized the managerial and political dimensions of the principal's role (Bunyamani, 2003; Buranajant, 2007; Gamage and Sooksomchitra, 2004; Hallinger, 2004; Hallinger et al., 1994; Wongtrakool, 1995). Thai principals are civil servants who function as line managers within the hierarchy of a highly centralized, national system of education (Bunyamani, 2003; Chuwattanukul, 2001; Fry, 2002; Taraseina, 1993). Ministry of Education officials have historically viewed the principal as a locally situated guardian of the nation's education policies and cultural values (Hallinger, 2004; Gamage and Sooksomchitra, 2004; Kaewdang, 2003; National Identity Office, 1991; Taraseina, 1993). Principals have been viewed as implementers of government policy, rather than as policy initiators, innovators or instructional leaders (Bunyamani, 2003; Fry, 2002; Gamage and Sooksomchitra, 2004; Hallinger, 2004; Hallinger and Kantamara, 2001; Hallinger and Lee, 2011; Leksansern, 2006; Taraseina, 1993). Thus we conclude that Thailand has never featured a normative tradition of *instructional leadership* within its system of education (Boontim, 1999; Bunyamani, 2003; Hallinger, 2001, 2004; Hallinger et al., 1994; Ratchaneeladdajit, 1997; Taraseina, 1993).

We assert that institutional policies and system culture have given the role a managerial and political focus (Hallinger, 2004). In Thailand, like most other Southeast Asian countries (for example, Malaysia, Vietnam, Laos, Indonesia), the traditional identity of principals as government officers represents a 'genetic strand' in the DNA of their role (Cuban, 1988). This assertion is consistent with findings from a recent international comparative study which found that principals in developing countries with hierarchical cultures tend to spend less time on instructional leadership than on organizational management (Lee and Hallinger, 2012).

However, these features of the traditional role of Thai principals conflict with a new set of institutional expectations embedded in policies that grew out of the NEA in 1999 (Boontim, 1999;

Bunyamani, 2003; Chuwattanukul, 2001; Gamage and Sooksomchitra, 2004; Leksansern, 2006; Oumthanom, 2001). In Thailand's post-reform era' principals are expected to actively lead teaching and learning development to an extent that simply did not exist in the past (Bunyamani, 2003; Hallinger, 2001, 2004; Kantamara et al., 2006; Leksansern, 2006; Maxcy et al., 2010). Moreover, the gradual implementation of school-based management over the past decade has resulted in new system expectations for principals to involve a broader variety of stakeholders in formal educational decision making in their schools (Boontim, 1999; Buranajant, 2007; Gamage and Sooksomchitra, 2004; Hallinger and Lee, 2011; Leksansern, 2006). Empirical evidence suggests that although Thailand's principals have generally supported these changes, many remain uncertain *how to enact these new roles effectively* (Bunyamani, 2003; Gamage and Sooksomchitra, 2004; Hallinger, 2004; Hallinger and Lee, 2011; Leksansern, 2006; Oumthanom, 2001). Thus, the current study explores the nexus between changing system expectations for principal instructional leadership and the capacity of Thailand's principals to respond.

Empirical Research on Instructional Leadership in Thailand

Our search for empirical research on instructional leadership in Thailand led to the identification of four doctoral dissertations conducted during the 1990s (Poovatanikul, 1993; Ratchaneeladdajit, 1997; Taraseina, 1993; Wongtrakul, 1997). These dissertations all examined principal instructional leadership in urban and suburban secondary schools. Although the studies addressed a variety of different research questions, the researchers all used a survey instrument to explore the impact of moderating variables on the exercise of principal instructional leadership. Three of the studies (Poovatanikul, 1993; Ratchaneeladdajit, 1997; Taraseina, 1993) used a Thai form of the PIMRS (Hallinger, 1982); the fourth (Wongtrakul, 1997) used a scale developed by Crabtree (1993).

The structural similarity of the doctoral studies extended to their use of a common analytical strategy. All four studies compared teacher and principal perceptions of the principals' instructional leadership. This was an *implicit* application of Merton's (1957) conceptualization of 'role set'.¹ Role set theory contends that a person's perception of a phenomenon is shaped by the role that the person is performing. For example, the roles of 'salesperson' and 'customer' shape a respondent's view of the same transaction. Similarly, role set theory proposes that the perceptions of teachers and principals towards the principal's behaviour as an instructional leader will be shaped by their different roles in the dyadic relationship.

The four doctoral studies operationalized this research design by comparing instructional leadership profiles based on survey data collected from principals and their teaching staffs. The profiles revealed the relative emphasis of the principals on the measured dimensions of instructional leadership. It is interesting to note that in all four of the doctoral studies, regardless of the scale employed, the principals perceived themselves as exercising more active instructional leadership across all of the measured instructional leadership dimensions than their teachers.² In addition, although teachers and principals differed in their perceptions of the *level of instructional leadership activity*, there was a high correlation between the principals and teachers in terms of the areas of relative strength and weakness. These patterns mirror findings reported in more than 19 other PIMRS role set studies conducted in the USA (Hallinger, 2011a; Hallinger et al., 2012), as well as studies conducted in Guam (San Nicolas, 2003), the Philippines (Saavedra, 1987; Salvador, 1999; Yogere, 1996), the Maldives (Wafir, 2011), Hong Kong (Chan, 1992), and Taiwan (Chi, 1997; Tang, 1997; Yang, 1996).

Role set theory is useful in helping us interpret the meaning of these differences in perceptions of the principal's instructional leadership. Rather than viewing one set of perceptions as accurate

and the other as inaccurate, role set theory predicts the likelihood that teachers and principals will differ in their assessments of the principals' instructional leadership. Thus, the consistency in the pattern of results on these comparative analyses actually affirms the *reliability* of these findings.

At the same time, several PIMRS studies have also sought to gain insights into the *validity* of scale results (see Hallinger, 2011a). These studies have conducted additional statistical analyses and also compared the teacher and principal results with data gathered from alternate sources such as school documents (for example, on school goals, contents of teacher evaluations). These studies suggest that the level of ratings assigned by teachers may possess higher external validity.

Method

In this section of the article we discuss the research design and methodology behind the secondary analyses conducted in this study. We emphasize at the outset that the value of this research lies in two related but analytically separate goals. The first goal was to develop a profile of the instructional leadership capacity of Thailand's primary and secondary school principals. The second goal was to assess whether that profile changed during the period following implementation of the reform law in 1999.

Research Design

In this study, secondary data collected with the same instrument during the period prior to implementation of a social intervention (that is, from Poovatanikul, 1993; Ratchaneeladdajit, 1997; Taraseina, 1993) are compared with first-hand data collected a decade after implementation. In this case, the intervention consisted of the NEA. We propose that this landmark legislation radically changed the institutional context for Thailand's 35,000 principals. Thus, the first-hand data collected in 2008 can be viewed as a measure of the impact of NEA-related policies on principal role behaviour in Thailand. Framed more explicitly in terms of the Far West Lab model, this research seeks to understand if and how principals have responded to substantial changes in their institutional context.

While the study approximates the form of a quasi-experimental study, the use of secondary data weakened our ability to achieve a true quasi-experimental research design. We draw upon Cook and Campbell's (1979) criteria for assessing quasi-experimental research by highlighting the following limitations of the current study.

- Some of the samples employed in the pre- and post-NEA eras were not random and could therefore be subject to distortion arising from different characteristics of the samples.
- During the 10-year duration of policy implementation following the passage of the NEA, other factors such as change in the composition of the population of principals could have impacted the results.
- Lack of teacher data in the 2008 study limits the construction of the instructional leadership profiles to a single source (that is, the principals) and reduced the power of our comparisons across the two time periods.
- Use of secondary data meant that the researchers had to rely on the use of those statistics reported in the dissertation studies.

These limitations in the research design imply the need for caution in making attributions of causality concerning changes in principal role behaviour. We will discuss the limitations again when we interpret the results of the study.

The PIMRS Instrument

In this article we analysed four datasets, each of which employed the PIMRS. The PIMRS (Hallinger, 1982) contains 10 subscales comprised of 50 behaviourally anchored items. For each item, the rater assesses the frequency with which the principal enacts a behaviour or practice associated with the particular instructional leadership function. Each item is rated on a Likert-type scale ranging from (1) almost never to (5) almost always (see Figure 1). The instrument is scored by calculating the mean for the items that comprise each of the 10 functions or 3 dimensions. This results in a 'profile' that describes perceptions of principal practice on measured sub-scales.

Three parallel forms of the instrument have been developed and tested: a self-assessment form completed by the principal, a teacher form and a supervisor form. As suggested earlier, the three doctoral studies collected data using both the teacher and principal forms of the PIMRS. The first-hand data collected in 2008 only employed the principal form of the scale. Therefore, the current study could only directly compare the principal data collected across the various studies.

The PIMRS has been used in 22 countries and translated into a variety of languages (Hallinger, 2011a; Hallinger et al., 2012). The three doctoral studies included in this research (Poovatanikul, 1993; Ratchaneeladdajit, 1997; Taraseina, 1993) employed the PIMRS-Thai Form (Hallinger, 1993). Taraseina (1993) used Ebel's test (1951) to assess the reliability of the PIMRS-Thai Form in a validation study of secondary school principals conducted in Thailand. Her results yielded reliability estimates of 0.95 for the full-scale and coefficients greater than 0.90 on the 10 instructional leadership functions (Taraseina, 1993).

The 2008 dataset was comprised of data collected with a shortened version of the PIMRS-Thai Form. This consisted of 20 items selected to measure the three 'dimensions' of the PIMRS framework.³ Cronbach's test of internal consistency was employed with the principal data and yielded *alpha* reliability scores as follows: full-scale, 0.96 defining a school mission, 0.88; managing the instructional program, 0.91; developing a positive school learning climate, 0.94.⁴ This level of reliability exceeds the accepted standards for research.⁵

Samples

Table 1 presents some variations across the four datasets used in this study in terms of sample sizes, geographic regions and sampling methods. For example, while both the Poovatanikul (1993) data and the Ratchaneeladdajit (1997) data were collected from the Bangkok area using random sampling, the other two datasets were focused on other regions as well, but not based on random sampling. Despite the variations, the four datasets commonly used the PIMRS-Thai Form and included secondary school principals. Notably, the comparison study employed data collected from a sample of 1195 Thai principals (primary, secondary and K-12) in 2008. Although not randomly selected, the sample was roughly representative of the Thai population of principals by geographic regions and included large numbers of primary and secondary school principals (Hallinger and Lee, 2013).

Data Analysis

We conducted two conceptually interconnected analyses consistent with the two goals of this study. In our effort to map current instructional leadership profile in Thailand, we analysed the dataset collected in 2008. We began by examining the structure of the dataset and generating descriptive statistics for principal instructional leadership on the three dimensions of the PIMRS framework. Missing data (less than 1% of the data) were imputed using the expectation-

Table 1. Sampling schemes of the four studies.

Research years	School types	Population	Areas	Sampling methods
Poovatanikul (1993)	Secondary	55 Principals and 550 Teachers	Central (Bangkok)	Cluster Random Sampling ^a
Taraseina (1993)	Secondary	10 Principals and 774 Teachers	North (Chiang Mai)	Non-Random Sampling
Ratchaneeladdajit (1997)	Secondary	49 Principals and 386 Teachers	Central (Bankok)	Simple Random Sampling
Hallinger (2008)	Primary/ Secondary/ K–12	454 Principals (Primary) 491 Principals (Secondary) 250 Principals (K-12)	North/South/ Northeast/ Central	Non-Random Sampling ^b

Notes: ^a The criterion for clustering the samples was large-size schools in the Thai context (that is, the number of students ≥ 2000). ^b As noted, although it was not based on random sampling, the sample was geographically representative of the Thai population of principals.

maximization (EM) algorithm on the total sample ($n = 1195$). Next, we employed latent mean analysis, a form of structural equation modelling (Aiken et al., 1994), in order to examine patterns of instructional leadership across sub-groups of principals within the sample. We employed latent mean analysis rather than multivariate analysis of variance owing to its superior ability to detect measurement error (Aiken et al., 1994; Cole et al., 1993; Hancock, 1997).

Using AMOS 19, we tested configural, metric, scalar and factor variance invariance for two principal groups (that is, secondary principals versus others principals in primary and K–12 schools). The descriptive statistics revealed that the data were non-normally distributed (for example, skewed towards the higher end of the rating response scale; see Appendix 1). Therefore, we employed a bias-corrected method for latent mean analysis by using bootstrapping in order to adjust the parameter estimates, standard errors and effect sizes. Bootstrapping involved resampling and replacing the original dataset 1000 times.

To address the second research goal, we sought to understand if there had been changes in the self-reported instructional leadership practice of principals following implementation of the reform law in 1999. We compared the instructional leadership profiles of the 491 secondary school principals in the 2008 dataset with the profiles of the secondary school principals generated in the three doctoral studies conducted prior to passage of the 1999 education reform. This comparison was possible because all of the four studies employed the PIMRS. We used descriptive statistics and then computed effect sizes to make this comparison.

Results

The presentation of results is organized in terms of the two goals of the study: to map the current instructional leadership profile of Thailand's primary and secondary school principals, and to assess whether principal engagement in the instructional leadership role has changed in response to reforms initiated in the institutional context of Thai education since 1999.

What Are the Instructional Leadership Profiles of Thai principals?

Overall, the 491 secondary school principals reported a fairly high level of engagement in instructional leadership. More specifically, they reported particularly high engagement in defining a school mission

Table 2. Tests for invariance: secondary versus primary/K–12 school principals.

Models	χ^2	d.f.	TLI	RMSEA	CFI	SRMR
Model 1: configural Invariance (baseline)	1080.4	334	.901	.043	.913	.042
Model 2: metric invariance	1107.6	350	.904	.043	.912	.046
Model 3: metric and scalar invariance	1229.1 ^a	370 ^a	.897	.044	.900	.047
Model 4: metric, scalar, and factor variance invariance	1234.7	373	.898	.044	.900	.051

Notes: $N = 1195$ principals. ^a The difference in the chi-square statistics between Models 2 and 3 suggests that the two models are different. At the same time, however, since the changes in the fit indices between the two models are not substantially different, the test of scalar invariance is not rejected (Kim et al., 2009). Considering its statistical stringency of $\Delta\chi^2$ regardless of the nature of data such as sample sizes (Anderson and Gerbin, 1988; Byrne, 2010, 2012; Hong et al., 2003; Marsh and Grayson, 1990), we relied more on the values of ΔTLI , $\Delta RMSEA$, $\Delta SRMR$, and ΔCFI in evaluating invariance tests by using cutoff points suggested by relevant literatures (e.g., Chenung and Rensvold, 2002; Hong et al., 2003).

(mean = 4.10, $SD = 0.70$) and developing a positive school learning climate (mean = 4.17, $SD = 0.72$). Their self-ratings on managing the instructional programme can be characterized as moderate on the five point PIMRS (mean = 3.78, $SD = 0.78$). One way repeated-measures analysis of variance, comparing the three different means of the same principals, verified that the engagement of principals in instructional leadership significantly differed by the three dimensions ($F(2) = 243.1, p < 0.000$). Specifically, principals indicated significantly higher levels of engagement in both defining a school mission (mean difference = 0.323, $SE = 0.019, p < 0.001$) and developing a positive school learning climate (mean difference = 0.391, $SE = 0.018, p < 0.001$) than managing the instructional programme.⁷

In order to enable further interpretation of this finding, we compared the instructional leadership profiles of the 491 secondary school principals with their counterparts in primary (454 principals) and K–12 schools (250 principals). In order to facilitate the analysis, we first combined the primary and K–12 principals into a single group. Then we conducted a series of invariance tests with bootstrapping for the two groups of principals (that is, secondary school principals and ‘others’). The invariance tests indicated that the data met requirements for configural invariance, metric invariance, scalar invariance and factor variance invariance (see Table 2). We compared the values of ΔTLI , $\Delta RMSEA$, $\Delta SRMR$, and ΔCFI for invariance tests rather than solely using $\Delta\chi^2$ given its statistical stringency that often ignores the characteristics of data such as sample sizes (Anderson and Gerbin, 1988; Byrne, 2010, 2012; Hong et al., 2003; Marsh and Grayson, 1990). As such, we used the values of ΔTLI , $\Delta RMSEA$, $\Delta SRMR$, and ΔCFI in evaluating invariance tests by using cutoff points suggested by relevant literatures (e.g., Chenung and Rensvold, 2002; Hong et al., 2003). We relied particularly on ΔTLI , $\Delta RMSEA$, and $\Delta SRMR$ since the value of ΔCFI always keeps decreasing with more restrict models (Hong et al., 2003). Results of invariance tests indicated that the values of ΔTLI , $\Delta RMSEA$ and $\Delta SRMR$ in model comparisons were minimal, ranging from .001 to 013.

Based on the invariance tests, the latent mean model with bootstrapping indicated an acceptable model fit (Fan and Sivo, 2007; Hu and Bentler, 1999)⁸: $\chi^2(367) = 1163.7$, $CFI = 0.907$, $TLI = 0.904$, $RMSEA = 0.043$, and $SRMR = 0.046$. As presented in Table 3, the latent mean model showed that secondary school principals (that is, the reference group) demonstrated stronger engagement than their counterparts in primary and K–12 schools on both defining a school mission (0.116, $p < 0.001$) and developing a positive school learning climate (0.147, $p < 0.001$). The effect sizes (Cohen’s d) further reinforced this conclusion of significantly stronger instructional leadership among Thailand’s secondary school principals on defining a school mission (0.450) and developing a positive school learning climate (0.636), and no differences on managing the instructional programme.

Table 3. Latent mean comparison of instructional leadership: secondary versus primary/K–12 school principals.

Leadership dimension	Estimate	SE	Sig.	Mean ^a	Mean-bias ^b	SE ^b	SE-bias	Effect size ^c
Defining a school mission	−0.117	0.034	$p < 0.001$	−0.116	0.001	0.033	0.001	−0.450
Managing instruction	0.026	0.029	$p = 0.372$	0.026	0.000	0.029	0.001	0.141
Developing learning climate	−0.148	0.031	$p < 0.001$	−0.147	0.001	0.031	0.001	−0.636

Notes: $N = 1195$ principals. ^a The reference group is secondary school principals. Thus, principals in primary/K–12 schools turned out to show significantly lower instructional leadership capacity in defining a school mission (-116^{***}) and developing a positive school learning climate (-147^{***}). ^b The bias in estimates and standard errors was corrected through bootstrapping. ^c Effect sizes were also calculated using corrected estimates.

These findings were, however, surprising in two respects. First, the self-ratings assigned by the full sample of principals (that is, 3.78, 4.10, 4.17) are quite high in an absolute sense on the five-point Likert scale. Given the traditional lack of focus on instructional leadership in Thailand, we were intrigued by this high level of reported engagement in the role. Second, the finding of stronger instructional leadership by Thailand's secondary school principals on two of the three PIMRS dimensions ran contrary to findings reported in the Western literature (Hallinger and Heck, 1996). The Western literature consistently suggests that the context of primary schools is more conducive to the practice of instructional leadership on the part of the principal (Bossert et al., 1982; Bryk et al., 2009; Hallinger, 2011a; Hallinger and Heck, 1996; Louis et al., 2010). The latter finding might be explained by the fact that in Asia there is a tendency to place the most capable administrators in secondary schools.⁹ Nonetheless, this still does not explain the high level of role engagement reported by the principals on the first and third dimensions of the PIMRS framework.

In order to better understand the 'meaning' of the scores reported by the Thai principals, we refer the reader to the literature reviewed earlier in this report. We noted that numerous PIMRS 'role set studies' had found that principals consistently rate themselves higher on the PIMRS than their teachers (Hallinger, 2011a; Hallinger and Lee, 2013; Hallinger et al., 2012). Although we did not have access to teacher ratings of the principals in the 2008 dataset, the dissertations had collected data from teachers as well as principals. Therefore, we decided to examine teacher perceptions of the principals' instructional leadership in the earlier studies in order to see whether they might offer additional perspective on this issue.

As illustrated in Figure 3, teacher perceptions reported in all three dissertations yielded *consistently lower scores on all three dimensions* of instructional leadership than principal self-ratings. Consistent with the broader PIMRS literature (Hallinger, 2011a; Hallinger and Lee, 2013; Hallinger et al., 2012; Hallinger and Murphy, 1985; Taraseina, 1993), this finding suggests that principals' self-report ratings are subject to inflation when compared to the perceptions of teachers. More specifically, the results synthesized from these three studies indicated that principal self-reports were an average of 17% higher than teacher ratings across the various dimensions.

If we extrapolate this finding to the 2008 dataset, it suggests that teacher ratings of the 491 principals would have yielded significantly lower scores on all three dimensions. For example, this *could* have reduced the *Mission* and *Climate* ratings to a moderate level (that is, ~ 3.5) and the *Instruction* dimension to a relatively low level (~ 3.25) for this scale. These scores would have indicated a substantially lower level of engagement in the role.

Despite the issue of inflated principals' self-report ratings, a recent meta-analysis of 52 empirical studies that had used the PIMRS indicated that the reliability of both the principal and teacher forms

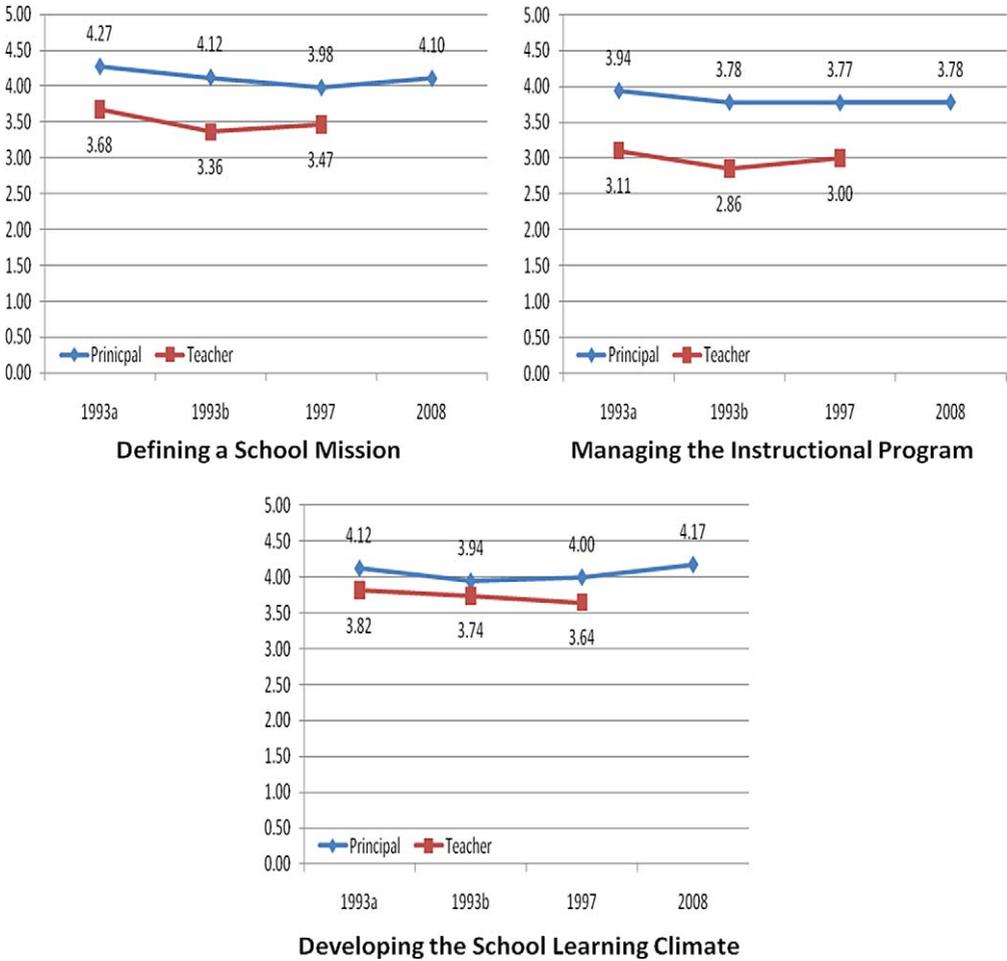


Figure 3. Comparisons of instructional leadership reported by principals and teachers.

Notes: in the figures, '1993a' indicates the Poovatanikul study (1993) sampling 55 principals and 550 teachers; '1993b' indicates the Taraseina study (1993) sampling 10 principals and 774 teachers (1993b); '1997' indicates the Ratchaneeladdajit study (1997) sampling 49 principals and 386 teachers; and '2008' indicates the author's data (2008) including 491 principals.

of the PIMRS was very consistent across organizational and cultural settings (Hallinger et al., 2012). This suggests that results based on analysis of both datasets can be utilized reliably for developing instructional leadership profiles. However, interpretation must be undertaken with care.

Has Education Reform Impacted the Profile of Principal Instructional Leadership?

The second goal of this paper was to understand whether the instructional leadership profile of Thailand's secondary school principals changed following passage of the NEA in 1999. Figure 4 shows the average instructional leadership ratings reported by principals from the four datasets. Comparison of the mean scores from the pre- and post-reform datasets yielded quite similar results with no apparent trends of increased engagement in instructional leadership practice after 1999.

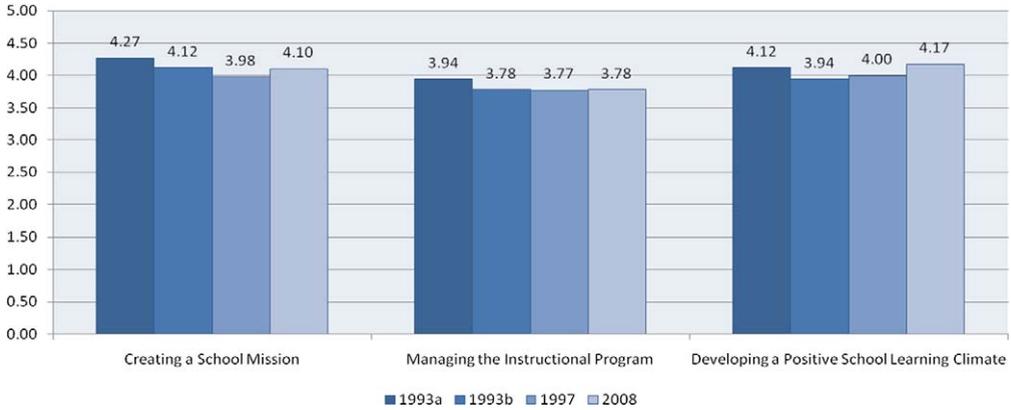


Figure 4. Instructional leadership reported by principals.
 Notes: $N = 55$ (1993a), $N = 10$ (1993b), $N = 49$ (1997), $N = 491$ (2008). To compare the three dimensions of instructional leadership between the 2008 data and the three secondary datasets, the 10 items representing instructional leadership functions were grouped into the three dimensions (see Appendix 2).

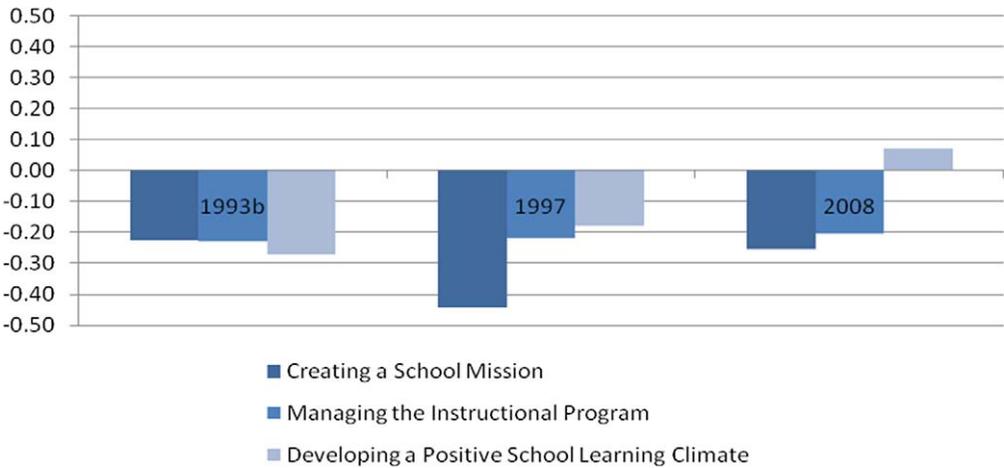


Figure 5. Change in principal instructional leadership based on effect sizes.
 Note: The reference group is the Poovatanikul (1993) study.

In order to verify the statistical significance of these descriptive results, we computed effect sizes (Cohen’s d) using means and standard deviations from the four datasets.¹⁰ When employing this statistic, a positive value indicates *enhancement* of instructional leadership practice among Thailand’s secondary school principals over time. A negative value represents a weakening in the perceived pattern of practice between the two time periods.

In order to conduct this analysis, we set the Poovatanikul (1993) study as a reference group for comparison with the 2008 data. As illustrated in Figure 5, there was no observed change in principal instructional leadership from the 1990s to 2008 despite the implementation of the nation’s education reforms. Indeed, the effect size estimates actually suggest some deterioration in ratings on defining a school mission and managing the instructional program. Only developing a positive school learning

climate evidenced any positive change, and this was quite small. Thus, these results suggest, rather surprisingly, that Thailand's secondary school principals were not demonstrating more active instructional leadership under the new institutional context of educational reform.

Discussion

The study's underlying premise was that the NEA represented a watershed event which changed the institutional context for Thailand's 35,000 school principals. This legislation, as well as the reform policies that flowed from it over the ensuing decade, changed their role definition and conveyed an explicit expectation for Thai principals to increase their engagement in the exercise of instructional leadership. As indicated earlier, policymakers envisioned principal leadership as critical to the successful implementation of reforms related to curriculum (Barron-Gutty and Chupradit, 2009; Fry, 2002; Hallinger and Lee, 2011; Kantamara et al., 2006), instruction (Hallinger and Lee, 2011; Kaewdaeng, 2001; Wiratchai et al., 2004) and education quality (Mounier and Tangchuang, 2009). In this final section of the report we summarize the findings, review limitations of the study and discuss the implications for leadership policy and practice in Thailand.

Summary and Limitations of the Findings

The results of this study can be summarized as follows.

- The national profile of instructional leadership suggests that Thai principals give significantly greater emphasis to their role in defining a school mission and promoting a positive school learning climate than to managing instructional programme.
- When compared with peers in primary and K–12 schools, secondary school principals are perceived to engage their instructional leadership role more actively on two dimensions: Defining a school mission and promoting a positive school learning climate. No differences were found with respect to engagement on the dimension of managing instructional programme.
- Analyses of the 2008 principal self-report data indicated that Thailand's principals are engaging in all three facets of instructional leadership at a moderate (instructional management) to high level (mission and climate). However, alternate analyses suggested that comparable data obtained from teachers would have likely yielded a similar pattern of leadership across the three dimensions, but at substantially lower level.¹¹
- The results of our analysis of data collected during the pre- and post-reform eras found *no increase in the level of engagement* in instructional leadership among Thailand's secondary school principals during the years following passage of the NEA in 1999.
- The comparative analyses conveyed a picture of considerable stability in the *patterns of principal instructional leadership practice*, even in the face of a major change in the institutional context.

While we believe that these conclusions are consistent with the data presented, we acknowledge limitations of our analyses. First, while there is reason to be confident of the *pattern of emphasis on different dimensions* of the instructional leadership role, the validity ascribed to their *level of engagement* remains open to debate. A stronger research design would have compared the pre-reform profile of principal instructional leadership obtained from principals and teachers with perceptions from both role groups during the post-reform era. However, given the opportunistic nature of data collection during the latter period, this simply was not possible. Although we sought to provide additional perspective on this issue through alternate analyses, we acknowledge the limitations of our solution.

Second, we noted that constraints imposed by the use of secondary data limited our ability to implement a true quasi-experimental research design. Although we compared pre- and post-reform results obtained from the same instrument, sampling limitations make causal attributions problematic. Thus, our assertions concerning stability or change in principal leadership profiles must be interpreted as indicative rather than conclusive.

Implications

As noted above, the first goal of this study was to develop a profile of principal instructional leadership. Although it is increasingly recognized that the demands of instructional leadership in school settings exceed the capacity of principals alone, research continues to emphasize the important role that principal play in leading reforms in teaching and learning (see Hallinger, 2003; Hallinger and Heck, 1996; Leithwood et al., 2006; Louis et al., 2010; Robinson, 2006). Thus, we believe that our effort to develop a national profile of principal instructional leadership warrants replication. Given the demonstrated reliability of the PIMRS (Hallinger et al., 2012), this type of profile holds promise for the purpose of needs assessment as well as benchmarking system-wide performance. The current study demonstrated some of these potential uses.

Despite the limitations noted above, the findings from this study do call into question the capacity of Thailand's principals to provide the type of leadership required to implement the nation's ambitious education reforms. We call particular attention to two of the findings. First there is a consistent pattern of lower engagement in the dimension managing the instructional programme across all of the studies, regardless of the data source (that is, teachers or principals). Second, there is a remarkable stability in the instructional leadership profiles across the studies and over time. Despite the clear vision for reform of teaching and learning embedded in the NEA of 1999, our data suggest little in the way of realignment of principal role behaviour to match these changes in their institutional context.

At the outset of this report, we introduced a quotation from the former Prime Minister of Thailand who claimed that, 'Quality does not depend on budget . . . More important is the extent to which administrators are dedicated to improving quality' (*Bangkok Post*, 1992: 1). While we agree with the prime minister's assertion, the results of this study suggest that simply expecting different practice from school leaders is insufficient to bring about change in their role behaviour. Indeed even in the USA, where instructional leadership has a stronger tradition, scholars have observed that principal practice has seldom aligned closely with the level of rhetorical emphasis accorded to instructional leadership (Cuban, 1988). Thus, it may not be surprising that new goals and expectations from Thailand's system leaders have been insufficient to bring about change in principal role behaviour. Indeed, this change for Thailand's principals has been no less challenging than the change from lecture-based teaching to student-centred learning for Thailand's teachers (Fry, 2002; Hallinger and Lee, 2011; Wirachtai et al., 2004). Thus, we reassert that 'dedication to quality' alone will not bring about change in principal practice.

In the face of a long tradition that has emphasized managerial and political roles in the principalship, change in role identity and behaviour among Thailand's principals will require a comprehensive, sophisticated and long-term human resource strategy. Recruitment, selection, training and development, as well as evaluation and on-the-job support will be needed to bring about this change. Other researchers have come to similar conclusions. For example, a study by Gamage and Sooksomchitra (2004) focused more specifically on the role of Thai principals in supporting the implementation of school-based management. They reported that 67.7% of their sample of principals felt that they were facing new challenges and changing role expectations without any clear training model in place. The

principals voiced high levels of uncertainty regarding their role in the new institutional context. Consequently, the authors urgently recommended more comprehensive training programs for school principals, especially in leadership and management (Gamage and Sooksomchitra, 2004: 301).

Our own observations would suggest that seven years after the Gamage and Sooksomchitra study, the human resource systems needed to support change in the capacity of Thailand's school-level leaders are largely absent. Although the nation has invested considerable resources in supporting reforms, there is a lack of systemic integration. For example, training is typically provided on a project-by-project basis, in the absence of an over-arching framework or curriculum. Few of the supporting mechanism required to bring about change in practice are evident (for example, on-going development and coaching).

Models of systemic human resource strategies that can support education reform exist both globally (for example, the UK) and regionally (for example, Singapore). However, political instability during this decade of reform in Thailand has undercut efforts to implement systemic change (Hallinger and Lee, 2011). For example, the former secretary general of OBEC recently observed that there were 13 different ministers of education during the eight years in which she led the Ministry's reform effort following adoption of the NEA in 1999 (Varavarn, 2011). Each of the ministers had different political interests and priorities, thereby making it difficult to maintain momentum in the implementation of long- or even medium-term plans. This reinforced an emphasis on change by projects rather than systemic change.

Consequently, we caution readers against interpreting the results of this study as a failure among Thailand's principals in the nation's quest for education reform. Change in the capacity of middle-level leadership within the education system requires not only clear goals but also a supportive human resource infrastructure. To date, we find little evidence of the latter. Therefore, in closing we wish to rephrase Prime Minister Chuan's earlier comment, and assert that the implementation of the human resource systems needed to support system-wide change depends on the 'extent to which Thailand's *system leaders* are dedicated to quality'.

Appendix I. Descriptive statistics of the 2008 data (reported by principals)

Dimensions and items	Mean	SD	Skewness	CR	Kurtosis	CR
Defining a school mission						
Develop a focused set of annual school-wide goals	4.08	0.68	-0.22	-1.90	-0.06	-.28
Use data on student performance when developing the school's academic goals	4.20	0.69	-0.50	-4.34	0.16	.67
Discuss the school's academic goals with teachers at faculty meetings	4.18	0.67	-0.65	-5.66	1.28	5.58
Ensure that the school's academic goals are reflected in highly visible displays in the school	3.66	0.83	-0.16	-1.37	-0.25	-1.08
Refer to the school's academic goals when making curricular decisions with teachers	4.08	0.69	-0.22	-1.91	-0.30	-1.30
Managing the instructional programme						
Make clear who is responsible for coordinating the curriculum across grade levels	3.93	0.82	-0.44	-3.84	0.20	.88
Participate actively in review of curricular materials	3.73	0.72	0.00	.03	-0.28	-1.23
Meet individually with teachers to discuss student progress	3.85	0.74	-0.07	-.57	-0.50	-2.19
Discuss academic performance results with the faculty to identify curricular strengths and weaknesses	3.85	0.73	-0.26	-2.22	-0.04	-.19

(continued)

Appendix 1. (continued)

Dimensions and items	Mean	SD	Skewness	CR	Kurtosis	CR
Use tests and other performance measures to assess progress toward school goals	3.58	0.79	-0.02	-.16	-0.43	-1.86
Visit classrooms to discuss school issues with teachers and students	3.87	0.77	-0.22	-1.88	-0.34	-1.49
Develop a positive school learning climate						
Reinforce superior performance by teachers in staff meetings, newsletters, and/or memos	4.11	0.73	-0.15	-1.27	-0.53	-2.30
Compliment teachers privately for their efforts or performance	4.14	0.72	-0.19	-1.64	-0.57	-2.47
Actively support the use in the classroom of skills acquired during inservice training	4.12	0.66	-0.27	-2.34	-0.77	-3.33
Obtain the participation of the whole staff in important inservice activities	4.20	0.63	-0.05	-.45	-0.43	-1.88
Lead or attend teacher inservice activities concerned with instruction	4.13	0.67	-0.19	-1.64	-0.25	-1.07
Set aside time at faculty meetings for teachers to share ideas or information from inservice activities	3.95	0.70	-0.24	-2.10	-0.03	-.12
Use assemblies to honor students for academic accomplishments or for behavior or citizenship	4.14	0.77	-0.13	-1.10	-0.38	-1.65
Recognize superior student achievement or improvement by seeing in the office the students with their work	4.03	0.78	-0.43	-3.72	0.05	.22
Contact parents to communicate improved or exemplary student performance or contributions	4.01	0.74	-0.21	-1.79	-0.61	-2.67

Notes: $N = 1195$ principals. The non-normality of the data was detected through critical ratios (CR in the table).

Appendix 2. Descriptive statistics of the three secondary datasets (reported by principals)

	Poovatanikul (1993)		Taraseina (1993)		Ratchaneeladdajit (1997)	
	Mean	SD	Mean	SD	Mean	SD
Defining a school mission	3.68	0.85	3.11	0.99	3.82	0.72
1. Frames goals	3.67	0.84	3.14	0.98	3.85	0.67
2. Communicates goals	3.68	0.86	3.07	0.99	3.78	0.77
Managing the instructional programme	3.36	0.92	2.86	0.98	3.74	0.78
3. Supervision and instruction	3.23	0.89	2.77	0.98	3.75	0.77
4. Coordinates curriculum	3.50	0.94	2.92	0.97	3.68	0.80
5. Monitors progress	3.36	0.94	2.88	0.99	3.79	0.78
Developing a school climate	3.47	0.92	3.00	1.02	3.64	0.87
6. Protects instructional time	3.66	0.85	3.15	0.96	3.53	0.82
7. Maintains high visibility	2.70	0.88	2.45	0.97	3.44	0.84
8. Provides incentives for teachers	3.43	1.02	2.91	1.10	3.45	1.01
9. Professional development	3.74	0.94	3.08	1.00	3.97	0.76
10. Provides incentives for learning	3.80	0.92	3.42	1.06	3.83	0.91

Note: $N = 55$ (Poovatanikul, 1993), $N = 10$ (Taraseina, 1993), $N = 49$ (Ratchaneeladdajit, 1997).

Notes

1. We have inserted the qualifier 'implicitly' into this description of methodology because although all four studies compared teacher and principal perceptions, none made explicit reference to role set theory.
2. Again we note that for the purpose of this analysis we included all four doctoral studies. Although one of the studies (Wongtrakul, 1997) used a different scale, it was employed in exactly the same manner analytically.
3. The shortened version was designed to measure the three dimensions, it included an insufficient number of items to make comparisons on the 10 instructional leadership functions (see Figure 2).
4. The three leadership dimensions demonstrated significant intercorrelations, ranging from .634 to .686. While these are moderately high, we found that the variance inflation factor was not substantially greater than 1 and the tolerance statistics were higher than 0.5. Thus, we concluded that multicollinearity was not a major issue. In order to achieve greater comparability of the pre and post data sets we employed the Spearman Brown test to correlate the items included in this study with results obtained from raw data sets that contained 50 items which we obtained from the publisher. Through this approach, it was possible to produce revised reliability estimates for the shortened form of the instrument for both the full scale and its three dimensions.
5. See Hallinger et al. (2012) for a full description of the scale's reliability as well as the rationale for using different reliability tests for the different types of data.
6. The same latent mean analysis could have been conducted, but the three dissertations did not provide correlation matrices.
7. Repeated-measures ANOVA is typically used for data measured at several points in time in experimental research. At the same time, it can be utilized for examining within-person differences in which the same subjects contribute to different means (for example, the same person's writing ability repeatedly measured by different tutors or instruments). In this case, the level of dependence between different conditions (for example, different tutors) should be roughly equivalent (Field, 2005), which is called sphericity. In our analysis, the Mauchly's test indicated that the assumption of sphericity was satisfied: $X^2(2) = 1.53$, $p = 0.466$.
8. Specifically, we relied more on standard cut-off recommendations (Hu and Bentler, 1999; Fan and Sivo, 2007). For the RMSEA and SRMR, values less than 0.05 and 0.08 suggest a good model fit and an acceptable model fit, respectively. For the CFI and TLI, values greater than 0.95 and 0.90 indicate goodness of fit and acceptable fit, respectively.
9. This was a hypothesis proposed by the staff of the OBEC Secretary General and received support in discussions with other policymakers. However, we have no specific data to support this assertion or the associated hypothesis.
10. Effect size estimates are independent of sample sizes.
11. Nonetheless, a recent meta-analysis with 52 data sets found that the 'pattern' of reliability results for the principal and teacher forms of the PIMRS is very consistent.

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