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Effects of educational reforms in the 2nd decade (2009—2018) on teacher motivation and student achievement among schools in Southern Thailand

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A R T I C L E   I N F O

ABSTRACT

This paper studied the effectiveness of four school reforms (instruction reform, teacher reform, learning sources reform, and administration reform) on improving school outcomes. Based on systems theory, this paper explored relationships among the four school reforms and their effects on teacher motivation and student achievement. The quantitative study was a secondary analysis using year 2014 datasets from a sample of 431 public basic schools in 3 southern provinces, Thailand. The researcher used structural equation modeling to explore the models and to verify cause—effect relationships among the variables. The research findings fairly confirmed the theoretical frameworks, and reflected some effectiveness of the 2nd decade school reforms in terms of whole organizational improvement and teacher motivation, although not student achievement. The key findings were discussed with a critical theory lens to depict Thailand as a case study of developing countries borrowing and struggling with global school reforms, and then proposed policy implications to improve the current education reforms as global issues, particularly for Thailand.

Introduction

Fry and Bi (2013) noted that the educational crises in Thailand included: 1) low quality of education; 2) inequality in educational opportunities; 3) an existing education system that did not correspond to the social, religious, and cultural contexts of local communities; and 4) inefficiency of the education system with centralized administration and bureaucratic management. These crises brought about the demand for current education reforms, according to the 1999 National Education Act (NEA), which aimed to develop every Thai to become a whole human being with a balance of all competencies. To achieve this

goal, the reform focused on: 1) an education system based on the concept of life-long learning; 2) instruction based on the concept of student-centered learning; 3) administration towards decentralization; 4) professional development for teachers; and 5) a quality assurance system in education (Ministry of Education, 1999).

However, the consequences of the educational reform in the past decade (1999—2008) (Hallinger & Bryant, 2013) showed the educational problems remained unresolved. Thus, the Office of Education Council (OEC) has implemented education reform in the second decade (2009 —2018), as a revised version based upon the NEA and its amendments. According to OEC (2009), the reform framework focuses on systematic education and learning reforms. In this reform framework, four policy approaches were proposed together: 1) instruction, 2) teachers, 3) learning sources, and 4) administration reforms.

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Instruction reform. Based on the framework for 21st century learning, particularly constructivist learning theory (Khemmani, 2006; Porcaro, 2011), OEC (2009) specified four instruction-reform strategies: 1) teaching students basic subject areas to raise their achievement; 2) improving student-centered learning and high-order thinking processes, particularly providing a variety of learning activities (problem-based learning); 3) integrating ethics and desirable Thai characteristics into the curriculum and instruction; and 4) developing students' life skills (learning enthusiasm, life-long learning.)

Teacher reform. OEC (2009) specified three teacher-reform strategies (see also Darling-Hammond, 2010): 1) maintaining teacher standards and quality assurance systems; 2) improving the ongoing professional development for teachers; and 3) improving teachers' work, particularly letting them focus mainly on academic work.

Learning sources reform. To promote quality life-long learning (Sahlberg, 2007; Thijssen, Maes, & Vernooij, 2002) for Thai students, OEC (2009) specified four reform strategies: 1) developing the school itself as a quality learning source; 2) providing ICT systems in school; 3) supporting learning communities and collaborative networks among educational institutions, local communities, the private sector, and social institutions; and 4) providing and developing quality learning sources within the local community.

Administration reform. OEC (2009) specified four strategies (see also Sahlberg, 2007): 1) school-based management; 2) good governance in school administration; 3) active participation of all sectors/groups in school development; and 4) providing more opportunities to access quality education for all groups of students.

As these education reform policies have been implemented in all schools nationwide, some national and local research projects reported mixed effects on school outcomes and student achievement. Moreover, many Thai scholars were concerned about the ineffectiveness (or even failure) of the reforms (Fry & Bi, 2013), and this led to proposals for reforming the education system yet again. The ambiguous research findings and chronic reform issues inspired the current study into the effects of school policies in the second decade education reform on teacher performance and student achievement as school outcomes.

As teacher performance is presumably affected by teacher motivation (Hoy & Miskel, 2008; Robbins, 2005), teacher motivation was used as a proxy for teacher performance; the concept of teacher motivation was based on Herzberg's two-factor theory and McClelland's theory of need (as cited in Robbins, 2005). Conceptual frameworks for this study were based on Hoy and Miskel's (2008) social systems model for school; that is, in general, a school process such as school reform affects school outcomes. In the school process, administration reform affects teacher, learning sources, and instruction reforms. Then, these school reforms affect teacher motivation and finally all the variables affect student achievement. The researcher expected to prove with empirical data the reform policies' effectiveness to school,

administrator, teacher, and student qualities, and to explore a sound model of their relationships.

Remarkably, Thailand's unique contexts may cause some anomalies in the theoretical frameworks. With a critical theory lens, these anomalous findings were discussed regarding the main issue—the sharp conflicts between Thai and Western cultures (Fry & Bi, 2013); that is, when the national reform policies borrowing Western innovations have been coercively implemented by traditional Thai schools, the latter's perceptions and practices may not willingly conform to the Western reform concepts and policies, and they may end up being the poor victims of cultural hegemony. The research findings and discussion were intended to raise the awareness of Thailand's educational issues, as well as global ones, leading to proposed policy implications for improving the current reforms.

Research Objectives and Hypotheses

1. To study the levels of implementing the four school reforms, as well as the levels of teacher motivation and student achievement, among schools in southern Thailand, and
2. To study the relationships among the four school reforms, Teacher Motivation, and Student Achievement, with the hypotheses that 1) if Administration Reform has a positive effect on Teacher Reform and Learning Sources Reform, then the latter variables have positive effects on Instruction Reform, and finally Student Achievement; 2) Administration Reform has a positive effect on Teacher Motivation, but the other reforms have positive reciprocal effects on the latter; 3) all four school reforms, as well as Teacher Motivation, have positive effects on Student Achievement. A conceptual framework for this study is depicted in Figure 1.

Research Method and Data

This quantitative research, using secondary data, was a cross-sectional, explanatory study examining the theoretical model and explaining relationships among the variables. The secondary data were a merger of two common datasets in 2014, each of which was designed and collected by a group of graduate students for their individual mini-research projects. These projects were studying the relationships between some variables within the same theme, that is, the whole model of this research.

Of the datasets, the population was public basic schools in southern Thailand and the sample was a group of the schools from Surat Thani, Yala, and Narathiwat provinces. As a limitation, the three provinces were selected based on the survey areas of the former researchers (local graduate students). To prevent sampling biases from oversampling and clustering of observations, the sampling method applied stratified multistage random sampling—in each province, schools were sampled proportionally according to school district and school size, and then the administrator and two teachers were sampled from each selected school. The data were drawn from a set of three questionnaires for each school, consisting of 1) Likert-scale
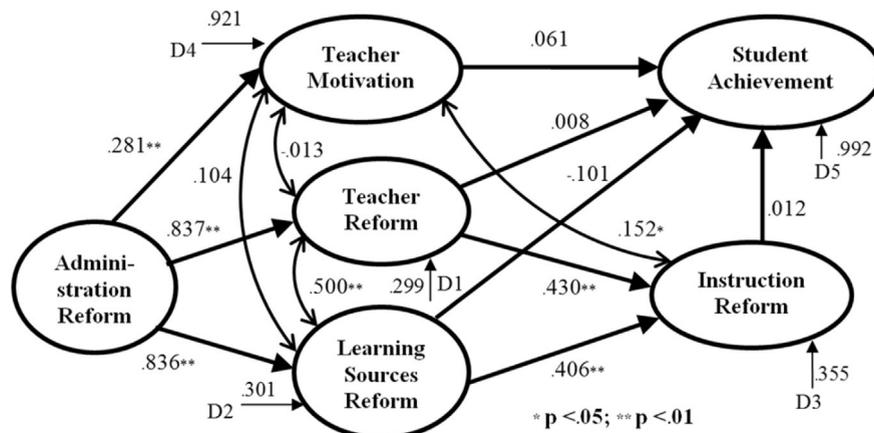
Figure 1 Structural model of relationships between the four school reforms, teacher motivation, and student achievement (Model 3 in Table 3)

questions for the administrator about implementing the four school reforms; 2) Likert-scale questions for teachers about their work motivation; and 3) the school's current Educational Quality (2011−2015) Indicator 5 (EQI5 − Student Achievement, based on the national test scores), certified by the Office of National Educational Standard and Quality Assurance (ONESQA). All the questionnaires were examined, adjusted, and confirmed in their construct validity (reviewed by relevant experts) and reliability (Cronbach's alpha for each factors ranged from .70 to .96).

After acquiring the secondary datasets, the researcher cleaned up the data using the expectation maximization method to obtain maximum likelihood estimations with missing data. Then, the common constructs and their variables used in this study were specified. Each of the main (observed) variables was created by computing the mean score of its question items. Finally, the two provincial datasets were merged into a regional dataset. The final dataset had 431 schools, consisting of 140, 121, and 170 schools from Surat Thani, Yala, and Narathiwat provinces respectively.

This study tried to keep a minimum of three variables per construct, except the construct of Student Achievement, which had only one observed variable, namely, the Educational Quality Indicator 5 (EQI5) score. According to Kline (2005, pp. 229−231), 20% of the variance of the observed variable—EQI5 score ($S^2 = 14.457$)—was specified as the value of its measurement error term (fixed to 2.891) for the construct of student achievement.

In the data analysis, according to Kline (2005), the researcher began by checking and mending the basic assumptions, and then analyzed descriptive statistics using means and standard deviations. Last, he conducted multiple regression analyses on a few conceptual models based structural equation modeling (SEM). The analyses were performed using the statistical software package, "R", and specifically the SEM package, "lavaan", which used maximum likelihood estimation. In the SEM analyses, the researcher conducted good-fit tests and model adjustments to improve the fit based on theoretical concepts with the recommended fit indices and their cut-off criteria.

Research Findings

The descriptive statistics of the four school reforms (Table 1) showed that all the school reform policies had high levels of implementation. Regarding the overall means, administration reform ($M = 4.19$) was implemented more than the other reforms, whereas learning sources reform was the least ($M = 3.75$). In the instruction reform, ethics-based instruction was implemented the most ($M = 4.23$), but constructivist instruction the least ($M = 3.69$). In the teacher reform, good-teacher praise was implemented the most ($M = 4.20$), but professional development was the least ($M = 3.92$). In the learning sources reform, promoting learning communities was implemented the most ($M = 3.87$), but developing ICT systems in school was the least ($M = 3.58$). Finally, in the administration reform, active participation of local community was implemented the most ($M = 4.33$), but decentralization into schools was the least ($M = 4.05$).

The descriptive statistics of teachers motivation (Table 2) showed that the teachers reported a high level of the overall work motivation, as well as for each of its components. Comparing the means of these components, the motivation from affiliation with others was greatest ($M = 4.16$), but that from work conditions was the least ($M = 3.91$). In addition, in the schools' educational assessment results, the EQI5: Student Achievement score had a mean of 9.23 (from 20.00), standard deviation of 3.80, and a moderate quality level (ONESQA, 2012).

From the SEM analysis results (Table 3 and Figure 1) in the confirmatory factor analysis, none of the indicators had low loadings to explain their factors (between .513 and .812), and none of the constructs had extremely high correlation with each other (between −.069 and .851), showing convergent validity and discriminant validity, respectively. In Model 1, the initial model, Administration Reform had no significant effect on Instruction Reform, so this relationship was deleted in Model 2. Regarding the reforms and teacher motivation, Administration Reform had a significant direct effect on the latter, while the other

Table 1
Descriptive statistics of the four school reforms

Variable	M	SD	Level of implementation
Instructional reform[a]			
1. Teaching to raise the national test scores	3.92	.46	High
2. Constructivist learning (problem-based)	3.69	.60	High
3. Integrating ethics into the instruction	4.23	.47	High
4. Developing students' life skills	4.15	.45	High
Overall	4.00	.39	High
Teacher reform[b]			
1. Maintaining the teacher standards and licenses	4.13	.49	High
2. Professional development in the instruction	3.92	.72	High
3. Focusing mainly on the academic work	3.95	.61	High
4. Praising and rewarding good teachers	4.20	.61	High
Overall	4.05	.45	High
Learning sources reform[c]			
1. Developing the school itself	3.82	.68	High
2. Developing ICT systems in school	3.58	.81	High
3. Promoting learning communities	3.87	.65	High
4. Providing local learning sources	3.74	.64	High
Overall	3.75	.59	High
Administration reform[d]			
1. Enhancing decentralization into schools	4.05	.58	High
2. Promoting good governance	4.23	.54	High
3. Active participation of local community	4.33	.55	High
4. Expanding education access for all students	4.13	.56	High
Overall	4.19	.46	High

Note: Level of implementation: very high (4.51–5.00), high (3.51–4.50), moderate (2.51–3.50), low (1.51–2.50), very low (1.00–1.50)
[a] 4, 3, 3, and 5 question items for its components respectively
[b] 4, 5, 3 and 1 items for its components respectively
[c] 4, 3, 3, and 5 items for its components respectively
[d] 5, 6, 5, and 4 items for its components respectively

reforms brought in similar results from both the direct effects on the latter (in Model 1) and the covariances with it (in Model 2). Thus, Instruction, Teacher, and Learning Sources Reforms toward Teacher Motivation could be specified as reciprocal relationships.

In the final model, Model 3, Administration Reform had a significant positive effect on Teacher ($b = .837, p < .01$) and Learning Sources Reforms ($b = .836, p < .01$), both of which had significant positive effects on Instruction Reform ($b = .430, p < .01$; $b = .406, p < .01$), and also had a significant positive effect on Teacher Motivation ($b = .281, p < .01$). Regarding relationships between the other reforms and Teacher Motivation, only Instruction Reform had a significant positive reciprocal relationship with the latter ($b = .152, p < .05$), whereas Teacher Reform had a

negative effect in Model 1 ($b = -.267, p > .05$) and a slightly negative reciprocal relationship in Model 2 and 3 ($b = -.013, p > .05$). In addition, there was a significant positive reciprocal effect between Teacher Reform and Learning Sources Reform ($b = .500, p < .01$). Finally, all the studied factors had no significant effects on Student Achievement; moreover, Learning Sources Reform showed a negative effect on the latter ($b = -.101, p > .05$), whereas the other reforms, as well as Teacher Motivation had positive effects.

Discussion

Effects among the Four School Reforms

Administration Reform as the Key Component
In the research findings, the administration reform significantly enhanced the learning sources reform and the teacher reform, and then the latter reforms significantly enhanced the instruction reform; that is, the implementation of administration reform was the key factor to increasing the implementation of all other school reform policies, such as learning sources reform, teacher reform, and instruction reform. This finding confirmed the hypothesis, based on Hoy and Miskel's (2008) model, that changing one dimension of the system, particularly the administrative subsystem for Thailand's public schools, causes substantial ripple effects on other dimensions and activities in the school.

Table 2
Descriptive statistics of teachers' work motivation[a]

Variable	M	SD	Level of work motivation
1. Achievement	4.07	.38	High
2. Recognition	3.96	.33	High
3. Relationships with others	4.16	.45	High
4. School policies and administration	4.02	.46	High
5. Work conditions	3.91	.45	High
6. Security needs	4.04	.46	High
Overall	4.03	.33	High

Note: Level of motivation: very high (4.51–5.00), high (3.51–4.50), moderate (2.51–3.50), low (1.51–2.50), very low (1.00–1.50)
[a] 7, 11, 4, 6, 4, and 6 question items for its components respectively

Table 3
Comparison of the SEM analysis results on a few conceptual models[a]

Good-fit indices	Model 1		Model 2		Model 3	
χ^2(df), p	χ^2(201) = 388.798, p = .00		χ^2(202) = 389.078, p = .00		χ^2(200) = 388.358, p = .00	
CFI/TLI	.962/.952		.962/.953		.962/.952	
RMSEA (90%CI)	.047(.040−.053)		.046(.039−.053)		.047(.040−.054)	
SRMR	.050		.050		.049	
	b	p	b	p	b	p
Regressions						
InsRfm						
TchRfm	.472	.003**	.427	.001**	.430	.001**
LSRfm	.432	.001**	.408	.001**	.406	.001**
AdmRfm	−.071	.596	−	−	−	−
TchRfm						
AdmRfm	.842	.000**	.837	.000**	.837	.000**
LSRfm						
AdmRfm	.838	.000**	.836	.000**	.836	.000**
TchM						
AdmRfm	.203	.205	.280	.000**	.281	.000**
InsRfm	.255	.037*	−	−	−	−
TchRfm	−.267	.187	−	−	−	−
LSRfm	.150	.355	−	−	−	−
StdAch						
TchM	.058	.336	.058	.337	.061	.319
InsRfm	−.070	.263	−.069	.265	.012	.928
TchRfm	−	−	−	−	.008	.963
LSRfm	−	−	−	−	−.101	.539
Covariances						
TchRfm−LSRfm	.493	.000**	.500	.000**	.500	.000**
TchM−InsRfm	−	−	.153	.036*	.152	.036*
TchM−TchRfm	−	−	−.013	.880	−.013	.877
TchM−LSRfm	−	−	.104	.156	.104	.156

Note: b = standardized coefficient; p = significance level; df = degree of freedom; 90% CI = 90% confident interval; **p < .01; *p < .05; InsRfm = instruction reform; TchRfm = teacher reform; LSRfm = learning sources reform; AdmRfm = administration reform; TchM = teacher motivation; StdAch = student achievement

[a] Added covariances in the measurement level: InsRfm1−LSRfm1, InsRfm3−InsRfm4, InsRfm3−TchRfm2, InsRfm3−LSRfm, InsRfm3−AdmRfm2, InsRfm3 −AdmRfm3, InsRfm4−LSRfm2, TchRfm1−AdmRfm1, TchRfm1−AdmRfm3, LSRfm1−AdmRfm1, LSRfm3−LSRfm4, AdmRfm1−AdmRfm2, AdmRfm2 −AdmRfm3, AdmRfm3−AdmRfm4, TchM1−TchM6, TchM3−TchM6, TchM4−TchM6, TchM5−TchM6

Congruity of the Administration and Instruction Reforms

Based on Dewey's (1916 as cited in Noddings, 1998) *Democracy and Education*, there are compatible relationships between decentralized administration and constructivist instruction approaches in democratic schools; that is, in the democratic concept, focusing on maintaining a balance between individualism and communitarianism, school-based management is an administrative concept which empowers teachers and the local community to actively collaborate and participate in school development and to share the common goal and responsibility for student learning. Compatibly, constructivist instruction is based on a concept of learning which encourages individual students to actively inquire, communicate, and construct shared values and knowledge as well as their own (Noddings, 1998). Thus, the school administration that empowers and gives autonomy to teachers in developing their instruction along with ongoing collaboration with other teachers and educators and students' active participation would provide the students a suitable constructivist learning environment and sustain their life-long learning.

Indirect Effect of Administration on Instruction

In line with the hypotheses, the school administration and student achievement as its outcome was formed as a "mediated-effects model" (Hallinger & Heck, 1998) in that the former had indirect effects on the instruction and then the latter via organization and teacher development. Thailand's traditional culture may influence the formation of this model because of the prevalence of deep-rooted authoritarian, paternalistic, hierarchical, bureaucratic governance (Mulder, 1996) that constrains the decentralization from the central government to schools, as well as from administrators to teachers (with the empirical evidence of the least implementation in decentralization and the least teacher motivation for power in the findings). In public schools, thus, administrators still dominated their teachers, focused only on school policies, and kept themselves out of lower-level management, for example, instruction and classroom management, by giving the teachers the full responsibility for implementation and then assessing the student outcomes for school re-planning without supervising teachers, or even understanding instruction/learning theories and philosophies; this incident reflected the lack of instructional

leadership among Thai school administrators (see Hallinger & Bryant, 2013). It was not surprising that Thailand's school administration and instruction were formed as neither "direct-effects" nor "reciprocal-effects" models.

Effects of the Reforms on Teacher Motivation

The hypotheses about teacher motivation were confirmed with the findings:

Administration Reform Affecting Teacher Motivation

The administration reform focusing on decentralization and good governance enhanced teacher motivation in that it empowered teachers in terms of academic freedom and shared responsibility in instruction and school development.

Instruction Reform Affecting Teacher Motivation and Vice Versa

The instruction reform focusing on constructivist learning and raising student achievement enhanced teacher motivation in terms of academic freedom and challenging achievement; in turn, teachers with high motivation would actively implement and improve their instruction, and therefore increased the implementation of the instruction reform.

Ineffectiveness of Learning Sources and Teacher Reforms

However, the learning sources reform and the teacher reform showed little reciprocal effect on teacher motivation. These findings might be explained as although designed for enhancing teachers' competencies and performance, those reforms might be seen as extra school workloads, adding to their heavy academic workload (see evidence in the OEC, 2011 report), so that they felt frustrated and exhausted.

Effects of the Reforms and Teacher Motivation on Student Achievement

There were unfortunately no significant effects of any of the expected factors on student achievement. The rationale for these findings is as follows:

Criticism of Teacher Motivation Theories

In the classic criticism of teacher motivation theories (Robbins, 2005), teacher performance, instead of teacher motivation, could have a direct effect on student achievement; in fact, teacher motivation is just one key factor in, or proxy for, teacher performance.

Poor Implementation in Teacher and Instruction Reforms

In the teacher reform, the teachers appeared to focus less on the implementation in professional development and instruction management; also, in the instruction reform, they did less in constructivist instruction and raising of the national test scores (see also Fry & Bi, 2013; Hallinger & Bryant, 2013). The less emphasis on these key factors might drop the quality of the instruction and student achievement. As shown in the OEC (2011) report, there has been an evident decrease in O-NET scores in most basic subject areas under the reform still being mostly implemented with traditional approaches. Fry and Bi (2013) asserted that Thailand's implementation of the reforms with the focus on quantity rather than quality lowered the teaching and learning quality.

O-NET Score, a Poor Indicator of Student Achievement

The national test, or O-NET, scores, which have been used as the ONESQA indicator of student achievement, as well as this study's, were regarded as a poor measurement to reflect authentic student achievement. The rationale for this is as follows:

1) *Incongruity between instruction and student evaluation.* The instruction reform supported constructivist instruction whereas student achievement was still measured using standardized tests. The nature of standardized tests focusing on closed-ended questions and content knowledge promoted rote learning, a narrow fragmented curriculum, and teacher-centered instruction, rather than thinking skills, a comprehensive integrated curriculum, and student-centered instruction (Porcaro, 2011), which are constructivist approaches;

2) *Heavy emphasis on teaching for tests.* Consequently, practices based on constructivist and life-long learning concepts (such as problem-based learning) toward "teaching for life" might be viewed as time-consuming and inefficient for raising the test scores, so schools, teachers, and parents focused heavily on "teaching for tests" by drilling and tutoring to memorize contents in previous tests;

3) *Skeptical quality of O-NET.* The quality or standardization of O-NET has been skeptical in the test content not matching the teaching content, difficulty levels, ambiguous questions and answers, and lack of testing and research on the tests.

Conclusion with a Critical Theory Lens

So far, Thailand's current reform—an integration of the four reforms toward democratic school and constructivist instruction—are on the right course to raise and sustain education quality. However, the findings clearly showed the effectiveness of the reforms in regard to organizational change but not student achievement; in other words, the school reforms were poorly implemented with the focus on quantity rather than quality.

The poor implementation of school reforms among schools in Thailand could be rooted mainly in: 1) national reform policies that borrowed Western innovations without research and development to adapt them into Thai/local culture and practices, and 2) the lack of preparation and support from the Ministry of Education and its educational agencies for enabling school administrators and teachers to aptly handle these educational innovations (Hallinger & Bryant, 2013). Consequently, the national reform policies borrowing Western innovations have been coercively implemented by traditional Thai schools, which have preserved traditional culture and practices.

Due to the sharp conflicts between Thai and Western cultures, people in traditional Thai schools would feel it was too hard to implement the reforms and would feel oppressed by the cultural hegemony as they were coerced to assimilate foreign, Western-like, culture and practices. As a result, their perceptions and practices may not willingly conform to the Western reform concepts and policies; for example, in the findings, the indirect effect of administration on instruction, reflected the neglect of instructional leadership among Thai school administrators and the lack of professional development, as well as the emphasis on teacher-centered instruction, among Thai teachers (see also Fry & Bi, 2013; OEC, 2011).

This lowered the reforms' effectiveness, and then remained as perpetual, ineffective implementation among the traditional and local schools because of their struggle with and resistance to change. In addition, it could widen achievement gaps among urban/large and rural/small schools, especially as the latter being the majority group in Thailand, may suffer from the reforms due to their lack of preparation and support.

Policy Implications

1) Whole-school reform, that is, reforming both school administration and instruction, is required to optimize school effectiveness as school administration leads, supervises, and supports teachers' teaching and students' learning. Nevertheless, the administration reform approach should be aligned with that for instruction, such as school-based management, a form of decentralization, and matching constructivist instruction, for student-centered learning.

2) The reform policies borrowing Western innovations need to be subjected to research and development programs on adapting and integrating the Western concepts into Thai/local culture and practices, and the Ministry of Education and its educational agencies should prepare and support the school administrators and teachers to aptly handle these educational innovations and reform policies.

3) The direct effect of school administration on instruction missing in a Thai context reflected the lack of instructional leadership among Thai school administrators (see more details in the discussion). Thus, for them, what was needed should be more preparation in pre-service, as well as training in-service, in curriculum and instructional design, and academic affairs management, while also engaging them in ongoing school curriculum assessment and development, and instructional supervision.

4) Teacher reform and learning sources reform, as factors to supporting instruction reform, had an evident reciprocal relationship, so they should go together in the forms of professional learning community (PLC) and school networks. That is, a PLC, in which teachers collaboratively work and learn to improve their teaching along with

coaching and mentoring (Khemmani, 2006) facilitates developing the teachers' competencies and instruction more effectively than training them outside the school for a few days. The PLC in one school needs school networks, as well as the community involvement, to connect with other PLCs and learning sources and enhance the school's teacher and student development. This concept has recently been promoted as an educational policy initiative in Thailand.

5) Teachers' work motivation had a reciprocal relationship with their instruction reform, so high teacher motivation would stimulate high teacher performance in effective quality instruction and vice versa. However, in the Thai context, the lack of teachers' motivation to excel their instruction, specifically based on the constructivist learning approach, was a bottleneck; thus, the quality of their constructivist instruction needs to be promoted and supported for sustainable student achievement.

6) The instruction reform didn't seem to be effective in student achievement in terms of the O-NET scores, due to the incongruity between constructivist instruction and standardized test (see more details in the discussion). Hence, student achievement should not be measured only by standardized test (O-NET) scores, but in combination with other constructivist evaluations (such as performance tests, portfolios, projects), with emphasis on thinking-skills tests; in addition, there should be more research and development on the proper measurement of student achievement and the O-NET contents and questions.

Conflict of Interest

There is no conflict of interest.

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