Quality School Improvement Project:
School’s Capacity, Developmental Characteristics, and Critical Issues in School Improvement in Hong Kong

Kong Chit-kwong
The Chinese University of Hong Kong

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KONG Chit-kwong
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Abstract:

This study examined the developmental profiles of a group of primary and secondary schools participating in a large-scale school improvement program—the Quality School Improvement Project—in Hong Kong. Using cluster analysis, schools were successfully classified into “high”, “medium”, and “low” school’s capacity in terms of principal leadership, school culture, teacher empowerment, and (perceived) students’ attitudes to learning. Subsequent analyses provided additional support for the validity of the classification and the results converged to demonstrate that schools with different capacity had differentiated improvement agenda and needs for external support. Implications for school improvement and educational reform in the Hong Kong school context were discussed.

Keywords: School Improvement Project, Cluster Analysis, School’s Capacity, School Development
Introduction

Recent research on school improvement has demonstrated that schools are not developed in the same way. Researchers have argued that schools may have different developmental profiles depending on their “initial conditions”, “school’s capacity”, or “growth states” (Chiu, 2003a; Hopkins, Harris, & Jackson, 1997). Some have also proposed differentiated improvement strategies and types of intervention for schools at different stages of growth (Chiu, 2003a; Hopkins, Harris, & Jackson, 1997). One of the critical issues in school improvement is thus the assessment of the initial conditions and the developmental needs of the school. And it has been reported that it takes about four months for school community members to learn about the school sufficiently well and to begin to take responsibility for school improvement (Hopfenberg, Levin, & Associates, 1993). In order to speed up this process, the Quality School Improvement (QSI) Project—one of the large-scale school improvement projects in Hong Kong—has developed a “stocktaking” exercise to facilitate the school as well as the project team to understand the conditions and the challenges of the school.

The “stocktaking” exercise collects crucial school data by both qualitative and quantitative methods. In brief, qualitative data are collected by interviewing the key stakeholders of the school, including the school principal, vice principal, a small sample of teachers, students, and parents by the School Development Officer (SDO) of the project team. The interviews usually take two working days. In complementary to the qualitative interviews, quantitative data are collected by two questionnaires: one for teachers and the other for students. The teacher questionnaire contains a number of key constructs in school effectiveness research such as perceived principal leadership, school culture, and feelings about the school and the students. On the other side, the student questionnaire consists of measures of student learning experiences, perceived teacher support and classroom climate, quality of school life, and self-concept. Empirical evidence and previous review have provided very strong support for the “stocktaking” exercise and the validity of the information collected (Caldwell, 1999, 2000; Lee, 2002; 2004).

In this study, we extended our investigation to examine whether the information collected in the “stocktaking” exercise could be used to classify schools into categories of differentiated “school’s capacity” or “growth states”. It was posited that teachers are the “focus of change” in school improvement and hence teachers’ perceptions on their principal leadership, school culture, teacher capacity and student
capacity are critical variables that differentiate schools into different initial states. Theoretically, we attempted to address the following research questions:

1. Is it possible to classify schools into distinctive categories, using measures of teachers’ perceptions on principal leadership, school culture, teacher empowerment, and students’ learning attitudes as criterion variables?

2. Does the classification in (1), systematically reflect the differences in school’s capacity for school improvement?

And practically, we attempted to facilitate our understanding on school improvement by categorizing schools’ developmental profiles into a smaller number of patterns. In summary, this study attempted to (i) provide an empirical test on the discriminant validity of a number of crucial variables (such as principal leadership and school culture) in predicting school’s capacity for school improvement, and (ii) formulate school development patterns for primary and secondary schools in Hong Kong.

Before proceeding to the details of the analysis, a review of literature on school improvement was given in below.

School improvement and school improvement projects in Hong Kong

There has been a strong plea for school improvement in many countries in the last two or three decades (Hopkins & Reynolds, 2001). This is partly related to the growing recognition of a huge demand for quality human resources for the economic and social growth in a highly competitive, knowledge-based, and post-industrial society in the near future (Hoy, Bayne-Jardine & Wood, 2000). In addition, the rapid increase in information and knowledge at an explosive rate also challenges the traditional teaching and learning approaches in many school systems and hence the emergence of a strong plea for change in school learning (Gray, Hopkins, Reynolds, Wilcox & Farrell, 1999). Indeed, the demand for school improvement by the community has transformed into many reform initiatives such as the school-based management, national curriculum, national standards and benchmarking, as well as many quality assurance policies such as quality school inspections in the last twenty to thirty years (Hopkins & Reynolds, 2001).

Based on the idea of facilitating educational reform more effectively, many school improvement programs or projects have been introduced and launched in western countries in the last two decades. Systematic reviews of the school improvement projects surprisingly found a relatively small number of successful cases (Hopkins, 2001). However, the Accelerated Schools Project (ASP) originated by Henry Levin in United States has been identified as one of the very successful cases in providing authentic school improvement (Levin, 2004).
ASP was established in 1986. It was started initially to provide academic accelerated for educational at-risk students. Instead of providing drilling and memorizing exercises to the at-risk students, these schools accelerate student learning by providing all students with challenging activities that traditionally have been reserved only for students identified as gifted and talented (Hopfenberg, Levin, & Associates, 1993). The approach is very successful and the number of Accelerated Schools increases sharply from 2 pilot schools in 1 state to over 1100 schools in 41 states in United States in about 17 years (Levin, 2004). Currently, the ASP not only serves schools of at-risk students, but extends to schools of average or above-average students. The long-term goal is to transform school culture and pedagogy from an emphasis on rote learning and memorization to authentic learning and powerful learning that could help the students to face the real-world challenges and develop important competencies required for the high-participating and high-productive workplaces (Levin, 1997a, 1997b, 2004). The ASP has provided a very important reference model for the development of school improvement projects in Hong Kong.

Territory-wide school improvement projects have been introduced into Hong Kong in the most recent decade. The Accelerated Schools for Quality Education Project (ASQEP) was perhaps the pioneer of large-scale school improvement projects in Hong Kong. Sooner after the resume of sovereign of Hong Kong by the Chinese Government in 1997, the Government of Hong Kong Special Administration Region (HKSAR) has established a 5 billion Hong Kong dollars Quality Education Fund for improving the quality of education in Hong Kong in 1998. The Hong Kong Institute of Educational Research of the Chinese University of Hong Kong was awarded a 60 million Hong Kong dollars grant for launching a large-scale improvement project (ASQEP) for 26 primary and 24 secondary schools in Hong Kong in 1998 to 2001. Evaluation on the progress of the ASQEP revealed quite promising outcomes and findings (Lee, 2002, 2004). And hence grants were subsequently awarded to the same school improvement and development team to extend their service to new batches of schools. The Quality Schools Project (QSP) was awarded 30 million Hong Kong dollars to serve 23 primary and 17 secondary schools in Hong Kong from 2001 to 2003 (Chiu, 2003b) and the Quality Schools in Action (QSA) was awarded 5 million Hong Kong dollars to serve 8 primary and 5 secondary schools in Hong Kong from 2003 to 2004 (Chiu, 2004).

In 2004, a new Education Development Fund (EDF) of 0.55 billion Hong Kong dollars was established by the Education and Manpower Bureau of HKSAR and several school improvement projects were awarded to provide a variety of school-based professional support services for primary and secondary schools in Hong
Kong. The original QSA Team was expanded to establish the Quality School Improvement (QSI) Team. It has been expected that the QSI Team would provide professional support for school improvement for a target of 115 primary and secondary schools in Hong Kong from 2005 to 2009. The first wave of school-based professional support served 15 primary, 24 secondary schools and 1 special education centre (a total of 40) in the academic year of 2004 to 2005. The QSI Team would serve each participating school for a period of two years. However, in order to award the service to a greater number of schools, a second wave of 20 brand new schools join the project in the academic year of 2005-2006 while the first batch of schools are still being served. In other words, there will be some degree of overlapping of different waves of schools from the second year (2005-2006) to the fourth year (2007-2008) of the QSI Project.

The QSI Project adopts a comprehensive model of school improvement in a sense that it aims at (i) enhancing the effectiveness of principal and departmental leadership, (ii) fostering an open and supportive school culture, (iii) enhancing the effectiveness of teaching, (iv) encouraging the provision of powerful learning experiences to the students, and (v) encouraging the creation of a caring and support school environment (Chiu, 2003a, 2003b, 2003c, 2003d). In order to achieve the above aims, the QSI Project emphasizes the importance of enthusiasm, commitment, and the moral purposes of the school, the teachers, and the School Development Officers. That is why we describe a quality school as “a school with heart” (QSI, 2004). School improvement work provided by QSI can be broadly classified as “Big-Wheels-Work” and the “Small-Wheels-Work”. The “Big-Wheels-Work” targets at helping the school to (i) build up working relationships with trust, confidence, and beliefs; (ii) establish a school self-refining system; and (iii) develop a school self-evaluation system. In the “Small-Wheels-Work”, it primarily focuses on (i) improving the effectiveness of learning; (ii) improving instructional designs and teaching; (iii) establishing school supporting networks and quality circles, and (iv) introducing parental support. In order to maximize the intervention effects, both school-wide and school-based modes of services would be provided (Chiu, 2001, 2003b, 2004; QSI, 2004). Upon several years’ practice, we have accumulated rich experience and a strong knowledge base for school improvement. In this study, we attempted to extend our understanding on school improvement by examining the relationships between school’s capacity and developmental characteristics of the primary and secondary schools in Hong Kong.

Growth states and differential developmental strategies
Based on research work in United Kingdom and elsewhere, Hopkins, Harris, and Jackson (1997) argue that schools have different growth states for change and development. Schools can be broadly classified into three categories: (a) the ‘failing or ineffective school’, (b) the ‘low achieving school’, and (c) the ‘good or effective school’. Hopkins et al. (1997) have proposed different developmental strategies for different types of schools. For the ‘failing or ineffective school’, it has been suggested that the school could: (i) change at the leadership level; (ii) provision of early, intense outside support; (iii) survey staff and student opinion, gather and disaggregate data on student achievement; (iv) a short-term focus on things relatively easy to change, e.g. the environment, attendance, uniform; (v) a focus on managing learning behaviour, not on behaviour management; (vi) intensive work on re-skilling teams of teachers in a limited but specific repertoire of teaching/learning styles; (vii) progressive restructuring to generate new opportunities for leadership, collaboration and planning; and (viii) withdraw external pressure/inspection in order to remove fear and give space to grow. For the ‘low achieving school’, it has been proposed that the school could: (i) change in leadership strategies; (ii) improve the environment; (iii) lengthen the lesson unit; (iv) review something linked to ‘standards’ (e.g. uniform, homework) involving all students and parents; (v) target particular students at certain thresholds (across the ability range); (vi) talk to pupils about their aspirations, give their achievement meaning; (vii) harness the energy and optimism of staff new to the school; and (viii) generate an on-going dialogue about values. Finally, for the ‘good or effective school’, the following strategies have been suggested: (i) articulate values, disseminate eloquence; (ii) raise expectations (teacher, pupil and the wider community), define achievement, create an achievement orientation; (iii) involve and empower students in the process of learning—develop a student character; (iv) use restructuring (and timetable) to create collaborative planning at department and classroom level; (v) engage long-term outside support focused on developing leadership skills, team building and models of teaching and learning; (vi) generate a common language around learning and achievement; (vii) give teachers ‘space’ to experiment; and (viii) celebrate and share successes, reinforce the ‘appetite for change’.

In synthesizing their research, Hopkins and associates proposed a set of favorable conditions for school improvement including (i) a commitment to staff development; (ii) practical efforts to involve staff, students and the community in school policies and decisions; (iii) ‘transformational leadership approaches; (iv) effective coordination strategies; (v) serious attention to the potential benefits of enquiry and reflection; and (vi) a commitment to collaborative planning activity (Ainscow,
Based on research and active participation in school improvement in Hong Kong, Chiu (2003a) has also identified a set of determinants for school improvement. These include (i) effective principal leadership, (ii) strong teacher capacity, (iii) effective teaching and learning strategies, (iv) high expectations to staff and students, and (v) effective external professional support. Chiu (2003a) has also proposed differentiated developmental strategies for different categories of schools in Hong Kong. However, Chiu’s classification system is substantially different from that of Hopkins et al. due to the differences in (secondary) school systems between Hong Kong and United Kingdom. Primarily because of the adoption of an extremely academically selective secondary places allocation system, secondary schools in Hong Kong are highly ability-segregated (Lo et al., 1997). Secondary schools in Hong Kong can be broadly classified as “high-“, “medium-“, and “low-ability” according to the average academic ability of student intakes at Secondary One (S1). And based on this classification, Chiu (2003a) discusses the strategies for school development for different categories of schools.

For the “low-ability school”, a high and immediate external support is expected. The school should (i) change in leadership style, emphasize core values, and unite colleagues on common goals; (ii) initial a new program/system for a small number of students (such as S1 induction program) to create the atmosphere and momentum for change; (iii) have a short-term focus on things relatively easy to change (e.g. new homework system, uniform, etc.) in order to gain confidence and competence to continue; (iv) have high expectations to students, and adapt curriculum and teaching strategies to the level of the students; (v) facilitate effective learning through enhancement in learning repertoires such as mastery learning and co-operative learning; (vi) develop a core curriculum and facilitate with appropriate teaching approaches; (vii) enhance teachers’ capacity through workshops and exposures to good practices; (viii) focus on creating positive and supportive classrooms; (ix) adopt multiple assessment approaches, including performance-based assessment and portfolio assessment; (x) provide experiential learning experiences; (xi) improve the learning climate of the whole school by effective uses of bulletin boards, walls, and public areas; and (xii) take good care of the new students, provide a safe and supportive school environment. In brief, the key concern is the development of students’ sense of belongings to the school and the provision of successful and meaningful learning experiences.
For the “medium-ability school”, an external support that characterized by high participation, good modeling, and collaborative is desirable. The school needs to (i) have an awareness of crisis and change initiatives, develop leadership in middle management; (ii) establish a self-inquiry mechanism, refine school development priorities through systematically collection of student information and school data; (iii) have a systematic plan to develop teachers’ capacity; (iv) create opportunities for professional dialogues and provide platforms for mutual learning; (v) start change or development from ‘small’ in teaching and learning (for example, from a critical item in education reform such as project-based learning). The essential idea is to broaden the scopes of the teachers, encourage them to employ new teaching approaches, and communicate aspirations to the students.

The “high-ability school” has achieved well above-average academic standard. In general, the teachers are quite satisfied with their current situations and may have got accustomed to the school routines and teaching practices, it is comparatively more difficult to have paradigm shift among the teachers. An external professional support focusing on new development and teaching approaches may be more desirable. In addition, the school needs to (i) have a strong knowledge base and a clear vision for further development, empower teachers and students at all levels, have a strong awareness of crisis; and work collaboratively to achieve better for all students; (ii) create a positive and supportive class culture, rather than a competitive and selfish culture; (iii) get to understand the students, refine school development priorities and raise expectations to the staff and the students; (iv) give teacher ‘space’ to experiment and try new ideas; (v) provide opportunities and platforms for professional development both inside and outside the school. In all, it is important to celebrate and share success, build on the advantages of the students, reinforce the ‘appetite for change’, and build a community for learning.

Unlike the secondary school system, the primary school in Hong Kong adopts an admission by vicinity mechanism and hence the ability-segregation situation in primary schools is much less profound than that in secondary schools. However, a small number of primary schools in Hong Kong have more advanced background and school traditions, these primary schools are particularly welcomed by parents and known as the prestigious primarily schools. A substantial proportion of the economically and socially advanced primary students in Hong Kong are attracted to these prestigious primary schools. Apart from the prestigious primary schools, the remaining primary schools in Hong Kong are more homogeneous in terms of the students’ academic ability. Chiu (2003a) has also proposed development strategies for school improvement for the primary schools in Hong Kong. Specifically, Chiu
(2003) emphasizes the importance of the development of teacher capacity and the quality of instruction in primary schools. He argues that the primary school teachers should foster the learning interest and develop the learning repertoires of their students by (i) demonstrating a caring and enthusiastic approach to classroom teaching; (ii) using fun, interactions, and presentations to enhance participation in learning; and (iii) reinforcing sense of achievement and satisfaction in the process of learning.

Some researchers have specifically focused on school improvement for schools in socio-economically disadvantaged areas. Schools in difficult and challenging circumstances are facing challenging pupil behavior, low achievement, low learning motivation and perhaps less encouraging working conditions as well. It is generally believed that there are no “quick fixes” for schools facing challenging circumstances and teachers in these schools have to work much harder to improve and stay effectiveness than their peers in more favorable socioeconomic circumstances (Muijs, Harris, & Chapman, 2004). Nevertheless, researchers have identified a number of strategies for schools in difficult and challenging circumstances. For example, in a systematic review of related studies, Muijs, Harris, and Chapman (2004) suggest the following approaches (i) a central focus on teaching and learning; (ii) effective and instructional leadership; (iii) creating a data-rich environment; and (iv) having high expectations of achievement staff, pupils, and parents. They also add that, for schools in challenging circumstances, a top-down approach to set the basics in place may be more desirable in the early phase of improvement and then should gradually move on to a distributed form of leadership and a focus on creating a learning communities.

In another review of the successful improvement experiences of 34 secondary schools in challenging circumstances in United Kingdom, four interconnected strategies are identified as effective in raising achievement in these schools: (i) changing the culture of the school (e.g., building relationships, strengthening morale and raising expectations); (ii) focusing on teaching and learning (e.g., fostering the teachers’ sense of professionalism, choice of appropriate courses); (iii) reviewing the school day (e.g., Easter and summer schools, homework-completion sessions); and (iv) the purposeful use of data, (e.g. evaluation of teaching and learning). However, the researchers also caution that these strategies should not be treated as receipt for school improvement. Instead, these strategies should be considered as a bank of ideas that may help the school to develop its own actions for its own circumstances (West, Ainscow & Stanford, 2005).
In sum, the literature has provided a sound knowledge base for school improvement for different categories of schools. In this study, we attempted to test empirically whether it is plausible to categorize schools into a small number of groups of differentiated school’s capacity based on the “stocktaking” data and evaluated the validity of the classification.

**Method**

*Sample and Subjects*

The data were derived from the QSI Project. The QSI Project, funded by Education Development Fund of the Government of HKSAR, aims at providing school-based professional support services to 115 primary and secondary schools in Hong Kong from 2004 to 2009. With the strong support of the Education and Manpower Bureau (EMB), 16 primary and 24 secondary schools were recruited in the first wave (2004-2006) of the project. Since these schools were not randomly selected, hence they were not likely a truly representative sample. However, the EMB did apply certain distribution criteria in selecting the schools, therefore the participating schools had a considerable degree of representativeness of the primary and secondary schools in Hong Kong in terms of school-organizing bodies, school districts, mode of subsidy (government, aided, and private), religious background, as well as the gender-specificity of schools (co-educational versus single-sex).

“Stocktaking” information was collected by both qualitative and quantitative methods. For each school, qualitative data were collected by scheduled interviews of the school principals, vice-principals, subject and department head teachers and teachers, parents, and students. Each session of interview took about 30 to 40 minutes. The whole exercise in general lasted for two days and was conducted by the School Development Officers of the QSI Team.

Quantitative data were collected by questionnaire surveys. Two questionnaires were used, one for teachers and the other for students. All the teachers in the school were requested to complete the teacher questionnaire. Students in primary 4 to 6 in primary schools and the students in secondary 1 to 3 in secondary schools were requested to complete the student questionnaire. The questionnaires were delivered to the school and the school was expected to arrange time for the completion of the questionnaires and return the completed questionnaires to the QSI Team within three weeks. Both the qualitative and quantitative data were collected from December, 2005 to January, 2006.
In the data collection period, some of the participating schools were busily preparing for the “School Self-Evaluation” and the “School External Review”, these schools were not able to arrange time for the “stocktaking exercise”. In addition, some schools reported that they were “fed-up” by questionnaire surveys from the EMB and other professional support teams in the recent one or two years and were quite hesitated to carry out any new questionnaire surveys. Finally, we got a complete set of qualitative and quantitative data for 11 primary and 13 secondary schools and this served as the database for our analysis.

Measures

The teacher questionnaire

The teacher questionnaire consists of measures on perceived principal leadership, school culture, teachers’ perceptions on their school (such as empowerment feelings, morale, organizational commitment, and job satisfaction) and their students (including academic emphasis and attentiveness). The psychometric properties of these measures were briefly reviewed in below.

Principal leadership. Teachers’ perceptions on principal leadership behavior were measured by the Leadership Practices Inventory (LPI, Posner & Kouzes, 1988, 1993). The LPI measures five dimensions of leadership practices. These are Model the Way, Inspire a Shared Vision, Challenge the Process, Enable Others to Act, and Encourage the Heart. Each dimension was tapped by 6 items. A preliminary analysis showed that the five subscales were highly correlated with one and other, therefore it is justified to average all the items to yield a single measure of Principal Leadership (Cronbach’s alpha=0.98, 30 items).

School culture. School culture was measured by the School Value Inventory developed by Pang (1998). The original School Value Inventory measures 10 subscales in organization values. In this study, only 4 key subscales were employed. The four subscales were Participation and Collaboration, Collegiality, Communication and Consensus, and Teacher Autonomy. All the items were averaged to yield a single score of School Culture (Cronbach’s alpha=.95, 16 items).

Teacher empowerment. Teacher empowerment was measured by an adapted version of the School Participant Empowerment Scale developed by Short and Rinehart (1992). 20 representative items in five subscales (Decision Making, Autonomy, Personal Growth, Self-efficacy, & Impact) were used in this study. All the items
were sum up to give a total score of Teacher Empowerment. The reliability coefficient for the Teacher Empowerment was .91 (20 items).

**Students’ attitudes to learning.** (Perceived) students’ attitudes to learning were measured by two subscales: Academic Emphasis and Attentiveness. The Academic Emphasis subscale was adapted from the Organizational Health Inventory (OHI, Hoy, Tarter, & Kottkamp, 1991) and the Attentiveness measure was adapted from an instrument called Students and Their Teachers developed by Friedman (1994). The two subscales are highly correlated (Pearson correlation coefficient=.73), therefore it is justified to combine them into a single measure of Students’ Attitudes to Learning (Cronbach’s alpha=.89, 10 items) for the sake of cluster analysis.

**Teacher morale.** Morale was defined by Evans (1998, p.30) as “a state of mind encompassing all the feelings determined by the individual’s anticipation of the extent of satisfaction of those needs which s/he perceives as significantly affecting his/her total work situation”. The Teacher Morale measure was adapted from the School Organizational Health Questionnaire (Hart, Wearing, Conn, Carter, & Dingle, 2000). 5 items were used. The reliability estimation for this measure was .92 (Cronbach’s alpha, 5 items).

**Job satisfaction.** The term job satisfaction is broadly referred as feelings a person has toward one’s job. The Job Satisfaction scale was a self-constructed measure. The scale consists of five items tapping teachers’ global evaluation of their job satisfaction. The items were “In many aspects, my job is close to my ideals.” “My job gives me personal sense of satisfaction.” “My working conditions are good.” “Up till now, I have obtained what I want from my job.” and “All in all, I satisfied with my job.” The reliability estimation for this scale was .87 (Cronbach’s alpha, 5 items).

**Organizational commitment.** Organizational commitment is defined as the strength of an individual's identification with and involvement in a particular organization. This definition highlight three characteristics: "(i) a strong belief in and acceptance of the organization's goals and values, (ii) a willingness to exert considerable effort on behalf of the organization; and (iii) a strong desire to maintain membership in the organization" (Mowday, Steers, & Porter, 1979, p.226). Teacher’s organizational commitment was measured by the Organization Commitment Questionnaire developed by Mowday et al. (1979). The original measure consists of 15 items and has been validated in the Chinese context (e.g., Tsui & Cheng, 1999). In this study, 9 representative items, including some negatively worded items, were used. The reliability estimation for this measure was .92 (Cronbach’s alpha, 9 items).
All the above measures were translated into Chinese and compiled into a questionnaire. A 7-point Likert scale, ranged from 1 (“strongly disagree”) to 7 (“strongly agree”), was used for each item. All teachers in the sampled schools were requested to complete the questionnaire anonymously and send back their responses to the research team directly or through the school office in sealed envelopes. Teachers were generally aware that the questionnaire was used to collect stock information about the current scenario of the school, thus the response rate was very high.

The student questionnaire
The student questionnaire contains measures on student learning (active learning and powerful learning), classroom climates (teachers’ support and disciplinary climate), quality of school life (teacher-student relations, social integration, sense of achievement, adventure & general satisfaction), and self-concept (such as academic and general self-concepts). The following gives a brief description of the relevant measures in this analysis.

Student Learning. Student Learning was examined by two subscales: active learning and powerful learning. Active learning has been defined as “the provision of learning opportunities for students to talk and listen, read, write, and reflects through problem-solving exercises, informal small groups, simulations, case studies, role playing, and other activities that require student to apply what they are learning” (Meyers & Jones, 1993, p.xi). In this study, four self-constructed items were used to tap active learning: (i) “we often have group discussion in class.” (ii) “we often have role-playing in class.” (iii) “we often have group game in class.” And (iv) “the teacher often arranges some outside-school visits (such as public library, museum).” The reliability coefficient for this scale was 0.76 (Cronbach’s alpha, 4 items). The concept of powerful learning was originated from the particular learning approach in the Accelerated Schools Project (Hopfenberg, Levin, & Associates, 1993). The fundamental principal is to create situations in which each student has an interest in learning, see a meaning in the lesson, and perceives connections between each school activity and his or her real life. Powerful Learning was tapped by asking the students to rate the extent to which they felt interesting, fun, energetic, useful, and innovative in their class learning experiences. On the other hand, Powerful Learning was also inferred from students’ impressions on teacher’s support and individual care in the learning situations. Sample items were: “I often feel that the activities in my class are very interesting.” “The teacher often provides individual student with some ways for improving his/her learning.” “I often feel that the activities in my class
are innovative.” The reliability coefficient for this scale was 0.89 (Cronbach’s alpha, 9 items). Students were requested to respond to each item on a five-point scale ranging from 1 (strong disagree) to 5 (strongly agree).

**Teacher support and classroom climate.** The measures for Teacher Support and Classroom Disciplinary Climate were adapted from the OECD PISA 2003 Student Questionnaire (OECD, 2004). The reliability coefficient for the Teacher Support was 0.84 (Cronbach’s alpha, 5 items) and that for the Classroom Disciplinary Climate was 0.76 (Cronbach’s alpha, 5 items). Students were requested to respond to each item on a four-point scale ranging from 1 (every lesson) to 4 (never or hardly ever).

**Quality of school life.** Four specific dimensions (Teacher-Student Relations, Sense of Achievement, Social Integration, & Adventurous Experience) and a global dimension (General Satisfaction) of quality of school life were examined in this study. Quality of school life was measured by an adapted version in Chinese validated by Pang (1999a, 1999b). The reliability of each dimension was estimated by Cronbach’s alpha. Specifically, the reliability coefficients were 0.91 for Teacher-Student Relations (8 items), 0.89 for Social Integration (8 items), 0.80 for Sense of Achievement (4 items), 0.81 for Adventurous Experience (5 items), and 0.91 for General Satisfaction (6 items). All items were on four-point scales varying between 1 (strongly disagree) and 4 (strongly agree).

**Self-concept.** Self-concept has been broadly defined as a person's self-perceptions formulated through experience with his environment, and these perceptions are particularly influenced by evaluations by significant others and environmental reinforcements (Shavelson, Hubner, & Stanton, 1976). Recent research on self-concept has demonstrated the importance of its multidimensionality and content specificity (Marsh, 1990a). In this study, self-concept was measured by an adapted version of the Self Description Questionnaire (SDQ) II (Marsh, 1990b). Only the General Academic and the General Self-concept were used in this analysis. The reliability coefficient for this Academic Self-Concept was 0.78 (Cronbach’s alpha, 3 items) and that for General Self-Concept was 0.73 (Cronbach’s alpha, 4 items). Students were requested to respond to each item on a six-point scale ranging from 1 (false) to 6 (true). Approximately half of the items were negatively worded.

All the above measures were translated into Chinese and compiled into a student questionnaire. The school was responsible for the administration and collection of the questionnaires. And students were requested to complete the questionnaire anonymously.

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The qualitative data
The intensive interview of the stakeholders of the schools also generated very rich information on the characteristics of individual schools. This database is undoubtedly very informative and valuable in the systematic consideration of school development and improvement strategies for individual school. However, in this study, we focused only on the common characteristics and emerging themes for school development in the current education reform. Specifically, we examined the schools’ vision team-building, and intended areas for improvement, the teachers’ reactions and readiness for change, and the students’ and parents’ attitudes to the school. In subsequent analyses, the qualitative data provided an alternative perspective to cross-validate the validity of the quantitative data. Furthermore, they also provided complementary information that could help to uncover the nature of the critical issues and the hindrances for school improvement in different schools.

Statistical analysis
The primary focus of this study was to enhance our understanding on school improvement by categorizing schools into a small number of developmental patterns using a set of criterion variables. Principal Leadership, School Culture, Teacher Empowerment, and Students’ Attitudes to Learning were selected as the criterion variables. Therefore, teachers’ ratings on these measures were first aggregated to yield the corresponding school-average scores. And cluster analysis was then conducted based on these school-average scores. Because there are a huge number of classification approaches in cluster analysis, and different approaches may yield different outcomes, we give a brief description of our approach in below.

Cluster analysis involves four basic steps: (i) the selection of a sample to be clustered, (ii) the definition of a set of variables on which to measure similarities among the entities in the sample, (iii) the computation of the similarities among the entities, and (iv) the adoption of a cluster analysis method to create groups of similar entities (Aldenderfer& Blashfield, 1984).

First of all, it is necessary to determine which sample of entities is going to be grouped together. Since there are substantial differences between primary and secondary schools in Hong Kong in terms of their school background, school curriculum, staff compositions, and work conditions, and the primary focus of this study is the classification of schools into groups of similar developmental needs and patterns rather than their prior differences in other non-developmental aspects, it is advisable to conduct cluster analysis separately for the primary and secondary
schools. In other words, two series of cluster analysis would be conducted, one series for the primary schools and the other series for secondary schools.

Secondly, the definition of a set of variables on which to measure similarities among the schools is the crucial part of cluster analysis. Based on research findings on school effectiveness and school improvement, Principal Leadership, School Culture, Teacher Empowerment, and Students’ Attitudes to Learning were selected as the criterion variables to measure similarities (or distances) among schools (e.g. Beresford, 2003; Fullan, 1992; Hopkins, 2001, Rosenholtz, 1989). In cluster analysis, researchers have to decide in advance whether transformation of data is necessary before the computation of the similarity measure. This issue arises primarily because of two common situations. First, variables are sometimes measured by different metrics such as height in centimeter and weight in kilogram, it is obvious that variables with different metrics are not directly comparable. Second, variables are sometimes measured on scales that have very different ranges, if a similarity measure is computed based on the differences of the values of all of the variables, the variable with large values will out-weigh the variables with smaller values. To solve these problems, researchers have suggested standardizing each criterion variable to unit variance and mean of zero as one of the many possible solutions. However, they also caution that the standardization process would probably reduce the differences between groups on those variables that may well be the best discriminators of group differences. In our database, the items of the four criterion variables were all measured by a common metric system with a theoretical range from 1 to 7 (a 7-point Likert scale). Differences in mean and range values of the criterion variables would probably reflect the actual differences in perceptions of the criterion measures, therefore, we considered that the raw values are good approximation of the reality and decided to use them without any transformation.

The third step involves the determination of the calculation method. There are many ways for calculating the similarity between two entities (for a brief review, see Everitt, 1993). Specifically in this study, the squared Euclidean distance was chosen as the measure of the “nearness” between entities. Mathematically, the squared Euclidean distance is the sum of squared differences over all of the criterion variables. For example, if two Schools A, & B differ in 1.2, 0.8, 0.5 and 1.0 in the mean values of the four criterion variables, the squared Euclidean distance is calculated as $1.2^2 + 0.8^2 + 0.5^2 + 1.0^2 = 3.33$. It is obvious that the smaller the squared Euclidean distance, the closer the two entities. In this study, the squared Euclidean distance is used as the similarity measure because it is consistent with the
clustering criterion adopted (known as the Ward’s method) in the clustering procedures.

There are various procedures in grouping entities into clusters. For example, the agglomerative hierarchical clustering method is one of the most common procedures in cluster analysis (Anderberg, 1973). In the agglomerative hierarchical cluster method, all entities are initially considered as separate clusters, therefore there are as many clusters as there are entities at the very beginning. Then, based on certain clustering criterion, similar clusters/entities are combined into similar clusters one by one until all the clusters/entities are joined together into a large single cluster. It is believed that clusters/entities joined together at an earlier stage are much more similar than those combined together at a later stage.

Finally, there are many criteria for deciding which entities or clusters should be combined at each step and the outcomes may differ as a function of criteria adopted. In this particular study, an optimization criterion of minimum variances within groups was adopted as the grouping criterion in cluster analysis (the Ward’s method). At each step of the clustering procedure, the within-cluster sum of squares is minimized over all separate clusters obtainable by combining two clusters from the previous step. This criterion tends to combine clusters with a small number of entities and hence is particularly appropriate for this study.

After classifying the schools into a small number of groups, additional analyses were then conducted to contrast the differences between groups. In this validation step, analyses were based on individual scores. Teachers’ ratings on the four criterion variables (Principal Leadership, School Culture, Teacher Empowerment, and Students’ Attitudes to Learning) were examined by multivariate analysis of variances (MANOVA). The analysis was then extended to include three additional variables in the teacher questionnaires (Morale, Organizational Commitment, and Job Satisfaction). This extension would provide additional test on the validity of the classification.

In order to provide a better picture of the scenario, students’ ratings on Student Learning and School Climates (Active Learning, Powerful Learning, Views on Disciplinary Climate), Quality of School Life (Teacher-student Relations, Social Integration, Sense of Achievement, Adventure, and General Satisfaction) and Self-Concept (Academic Self-concept and General Self-concept) were also compared by MANOVA.
Finally, the qualitative data were analyzed systematically to validate and contrast the differences in different clusters of schools. And additional analyses were conducted to reveal the nature of discrepancies among different clusters of schools.

Results

Cluster analysis and MANOVA (primary schools)

The results of cluster analysis for primary schools were summarized as a dendrogram in Figure 1. In cluster analysis, there is no objective and absolute method in determining the “number of clusters”. Judging from the classification pattern and the change of the “fusion or amalgamation coefficient” (a measure of similarities between clusters), it was decided that a three-cluster solution was most appropriate.

Based on a three-cluster solution, the schools were grouped together, and Table 1 summarizes the group differences in teachers’ perceptions on the key measures in the teachers’ questionnaire. Two sets of MANOVA were conducted on the teachers’ measures. The first set of MANOVA examined the group differences on the four criterion measures: Principal Leadership, School Culture, Teacher Empowerment and Students’ Attitudes to Learning. Since the above set of variables were used to differentiate groups, it was logical that there were significant mean differences in these measures across groups (Wilks’ $\lambda=0.774$, $F(8, 882)=15.06$, $p<0.001$). And the results of the subsequent univariate analysis of variances (ANOVA, shown in the last row of Table 1) showed that there were significant group mean differences in all four criterion measures across groups. Post hoc group comparisons were conducted and the results were indicated by the superscripts in each column, different superscripts indicated significant difference in group means whereas the same superscript indicated comparable group means.

The second set of MANOVA was conducted on an additional set of teachers’ variables including Teacher Morale, Job Satisfaction, and Organization Commitment which were not included as the criterion variables in the cluster analysis. The results of MANOVA showed that there were significant mean differences in these variables across groups (Wilks’ $\lambda=0.799$, $F(6,884)=17.46$, $p<0.001$). The results of univariate ANOVA showed that all three measures were statistically different across groups (shown in the last row of Table 1). Similarly, the results of post hoc group comparisons were indicated by the superscripts in each column, different superscripts indicated significant difference in group means whereas the same superscript indicated comparable group means.
The above results revealed that the four primary schools in Cluster 1 (Primary), as perceived by their school teachers, were relatively “low” in Principal Leadership, School Culture, Teacher Empowerment, Students’ Attitudes to Learning, Teacher Morale, Job Satisfaction, and Organizational Commitment. In comparison, Cluster 2 (Primary) represented a group of five primary schools which were evaluated as “medium” in the above set of measures. And finally, the two primary schools in Cluster 3 (Primary) were judged by their teachers as “high” in the above teachers’ measures.

Group comparisons in students’ perceptions were also examined. Three separated sets of MANOVA were conducted on Student Learning and School Climate, Quality of School Life, and Self-concept. The results indicated significant differences in Student Learning and School Climate (Wilks’ $\lambda = 0.970$, $F(8, 8366) = 16.06, p<0.001$), and Self-concept (Wilks’ $\lambda = 0.994$, $F(4, 8372) = 6.57, p<0.001$), but not in Quality of School Life (Wilks’ $\lambda = 0.995$, $F(10, 8348) = 2.22, p>0.01$). The results of univariate ANOVA on individual subscale were showed in the last row of Table 2. There were significant differences in the subscales of Active Learning, Teacher Support, Disciplinary Climate, Academic Self-concept and General Self-concept. And mean values in different superscripts indicated significant difference in group means.

It should be noted that students in Cluster 3 (Primary) reported a higher level in Active Learning and Teacher Support than that in Clusters 1 and 2 (Primary). And it is interesting to note that students in both the “low” and “high” Clusters (Primary) reported slightly lower Academic and General Self-concept than that in the “medium” Cluster (Primary). In general, group differences in student characteristics among primary students were not very much frequent, probably suggesting that the primary students in different groups of schools were relatively homogeneous despite that there were significant differences in teachers’ perceptions on many aspects of their schools.

Combining the results from both the teacher and student questionnaires showed that schools in Cluster 3 (Primary) appeared to have a much favorable ‘conditions’ or ‘capacity’ for school improvement than that in the other two Clusters (Primary) in terms of Principal Leadership, School Culture, Teacher Empowerment, Students’ Attitudes to Learning, other teachers’ perceptions (Teacher Morale, Job Satisfaction, & Organizational Commitment), and Student Learning and School Climates (Active Learning, Teacher Support, & Disciplinary Climate).
Rescaled Distance Cluster Combine

Primary School

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
</tr>
</tbody>
</table>

Figure 1. Dendrogram using Ward Method (Primary Schools)
Table 1: Group differences in perceived principal leadership, school culture, teacher empowerment, students’ attitudes to learning, teacher morale, job satisfaction, and organizational commitment among teachers from schools of different clusters (primary schools).

<table>
<thead>
<tr>
<th>Cluster (Primary)</th>
<th>Number of Teachers</th>
<th>Teachers’ Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Principal Leadership</td>
</tr>
<tr>
<td>1 (4 schools)</td>
<td>182</td>
<td>Mean 4.303 ± 1.033</td>
</tr>
<tr>
<td>(G, E, B, A)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (5 schools)</td>
<td>186</td>
<td>Mean 5.553 ± 0.693</td>
</tr>
<tr>
<td>(D, H, J, I, C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 (2 schools)</td>
<td>79</td>
<td>Mean 4.761 ± 1.043</td>
</tr>
<tr>
<td>(K, F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>447</td>
<td>Mean 4.761 ± 1.043</td>
</tr>
</tbody>
</table>

Univariate ANOVA:
- F test, df=2,444: 50.73, 44.70, 17.29, 8.77, 47.59, 19.15, 36.22
- Sig. level (p<): 0.001, 0.001, 0.001, 0.001, 0.001, 0.001

Notes: 'Higher scores indicate more favorable ratings. Similar group means were indicated by the same superscript and different group means were indicated by different superscripts in each column.'
### Table 2: Group differences in student learning and social climate, quality of school life, and self-concept among students from schools of different clusters (primary schools).

<table>
<thead>
<tr>
<th>Cluster (Primary)</th>
<th>Number of Students</th>
<th>Student Learning and School Climates</th>
<th>Quality of School Life</th>
<th>Self-concept</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Active Learning</td>
<td>Powerful Learning</td>
<td>Teacher Support</td>
</tr>
<tr>
<td>1</td>
<td>2003 (4 schools)</td>
<td>Mean[^{a}] 2.998 (\pm 0.880)</td>
<td>Mean[^{b}] 3.372 (\pm 0.783)</td>
<td>Mean[^{c}] 2.979 (\pm 0.681)</td>
</tr>
<tr>
<td>(G, E, B, A)</td>
<td>1216 (5 schools)</td>
<td>Mean[^{b}] 3.148 (\pm 0.871)</td>
<td>Mean[^{d}] 3.404 (\pm 0.761)</td>
<td>Mean[^{e}] 2.952 (\pm 0.673)</td>
</tr>
<tr>
<td>(D, H, J, I, C)</td>
<td>973 (2 schools)</td>
<td>Mean[^{c}] 3.303 (\pm 0.844)</td>
<td>Mean[^{d}] 3.444 (\pm 0.738)</td>
<td>Mean[^{e}] 3.051 (\pm 0.677)</td>
</tr>
<tr>
<td>(K, F)</td>
<td>Total 4192</td>
<td>Mean[^{d}] 3.112 (\pm 0.877)</td>
<td>Mean[^{e}] 3.398 (\pm 0.766)</td>
<td>Mean[^{f}] 2.988 (\pm 0.679)</td>
</tr>
</tbody>
</table>

**Univariate AONVA**

<table>
<thead>
<tr>
<th></th>
<th>F test</th>
<th>Sig. level (p&lt;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>df=2,4189</td>
<td>41.75 2.97 6.08 6.92 1.86 0.88 1.56 0.68 0.65 8.44 11.72</td>
</tr>
<tr>
<td>SD</td>
<td>0.001</td>
<td>n.s. n.s. n.s. n.s. n.s. n.s.</td>
</tr>
</tbody>
</table>

**Notes:**\[^{a}\]Higher scores indicate more favorable ratings. Similar group means were indicated by the same superscript and different group means were indicated by different superscripts in each column.
Qualitative analysis (primary schools)

Cluster 1. For schools in Cluster 1, misunderstandings and poor communications among staff emerged as the critical issues for school development. In some cases, the issues appeared as mismatches in expectations between the principal and the teachers. It could be that the principal thought that the teachers were not good enough in meeting his/her expectations, or in the other way round that the teachers felt that the principal was not strong enough in leading the school effectively, or even a mutual accusation of one another. The causes of these problems were usually complicated by many factors. For example, the school had not developed effective communication channels between the principal and teachers, and a general lack of consensus and unity of purpose for school development. In a few number of schools, the high turnover rate of teachers, up to almost 30% in each year, might also lead to adjustment problems of the new and young teachers, as well as the poor cooperation between the new and experienced teachers. In general, the teachers in this cluster perceived their students as weak and just expected them to work to achieve the minimal standard. At the same time, the students also shared unfavorable feelings to the school, for example, some of the students expressed that they were quite hesitant in recommending their school to their relatives or neighbours because their teachers were mean to them and the standard of the school was low. In reaction to educational change and school improvement, both the teacher as an individual and the school as a whole had limited ideas and initiatives to try on innovations and new approaches. The critical issues for school improvement in this cluster of schools were thus the unity of people—including the principal and the teachers—from vision building and the development of goals for the common interest of the students, the teachers and the school.

Cluster 2. These schools have attained a reasonable good academic standard as reflected in their students’ performance in the Territory-wide System Assessment in Hong Kong. In addition, the primary six graduates of this cluster of schools have been allocated to secondary schools of average or above-average academic standards, such as schools with primarily Band 1 and Band 2 student intakes. Therefore, these schools are generally popular by the parents. Teachers in these schools usually described their students as well-behaved and obedient, but not very much active in learning. Multiple sources from the school principal, the teachers, and the students, converged to show that the majority of the teachers in this cluster have adopted a very tradition approach to classroom teaching, and most of them are skillful and efficient in their presentation. Primarily because of the academic success of the school; the average to good academic performance of the students; and the strong support from parents, the teachers felt good about themselves and their present situation and would like to
change and developed if and only if those new approaches have really been proved to be effective and consistent with their present practices. To this cluster of schools, the demonstration of successful learning experiences and the exposure to new and effective teaching ideas are very crucial in initiating change, and the teachers need very strong external support during the change process.

Cluster 3. Cluster 3 schools shared many of the common characteristics as that in Cluster 2 schools, such as good student intakes; good discipline and a reasonably strong academic background of the students; supportive parents; high school-average academic standard; and a very good reputation in the community. In addition to the above strengths, these schools have also established very good working relationships among colleagues and very good teacher-student relationships. Student caring and teacher support are usually described as good to very good, as perceived by the students and the parents. It also appeared that teachers in Cluster 3 schools have established significant progress in some of the key concerns in the current education reform, such as school-based curriculum, holistic learning, and project-based learning. The major challenges to teachers in these schools were the refinement of their programs, the consolidation of their learning experiences, and the dissemination of their successful experiences to other teachers within or even outside the school so that the change and development could be institutionalized. A moderate to strong external support is desirable in the change process.

The results of quantitative and qualitative analyses were very much consistent and complementary to one another. Both converged to demonstrate the differentiated developmental capacities and developmental states of schools in different clusters in an increasing order from Cluster 1 to Cluster 3. It is recommended that schools in Cluster 1 and 2 need to reflect on their current practices and gain experience in alternative practices. Practically, these schools have to direct their resources and energy more effectively and efficiently towards a small number of change initiatives, rather than taking too many innovations at one time. To two to three schools in Cluster 1, it is very much necessary to transform the teaching from a traditional, teacher-centered, and drilling approach to a more lively, interactive, and active learning approach, in order to meet with the needs of the students.

Cluster analysis and MANOVA (secondary schools)

The results of cluster analysis for secondary schools were summarized as a dendrogram in Figure 2.
A three-cluster solution appeared to be the best and appropriate solution. The mean values of the teacher measures were shown in Table 3. MANOVA showed that the three groups were significantly different in measures of School Leadership, School Culture, Teacher Empowerment, and Students’ Attitudes to Learning (Wilks’ $\lambda=0.665$, $F(8, 1376)=38.90$, $p<0.001$). The results of univariate ANOVA showed that the group differences were all significant in all subscales (shown in the last row of Table 3). The results of post hoc group mean comparisons were indicated by superscripts. Different group means were indicated by different superscripts, whereas comparable group means were denoted by the same superscript in each column.

A separate MANOVA revealed that there were also significant differences in teachers’ ratings on Teacher Morale, Job Satisfaction, & Organizational Commitment (Wilks’ $\lambda=0.677$, $F(6, 1378)=49.55$, $p<0.001$). Subsequent univariate ANOVA showed that all three measures were statistically different across groups, the F and p values were shown in the last row of Table 3. The results of post hoc group mean comparisons were indicated by superscripts. Different group means were indicated by different superscripts, whereas comparable group means were denoted by the same superscript in each column.

Similar to that of the primary schools, a set of labels of “low”, “medium”, and “high” were used to label Clusters 1, 2, & 3 (Secondary) respectively in terms of teachers’ perceptions of their school. An examination of the background information of the schools showed that schools in Clusters 1 and 2 (Secondary) primarily receive Band 3 (least able) students in their S1 intakes (sometimes referred as Band 3 schools in Hong Kong). And schools in Cluster 3 (Secondary) primarily take in Band 2 (medium able) and to a lesser extent Band 1 (most able) students in Hong Kong. It is interesting to note that teachers in high-banding (more able) schools had much more favorable ratings on all measures of Principal Leadership, School Culture, Teacher Empowerment, Students’ Attitudes to Learning, Teacher Morale, Job Satisfaction, and Organizational Commitment than that of low-banding (less able) schools. A careful examination of the qualitative data revealed that schools in Clusters 1 and 2 (Secondary) had very much similar student intakes at S1. But the teachers and students in Cluster 2 (Secondary) schools reported a more student caring environment than that in Cluster 1 (Secondary) schools.
Rescaled Distance Cluster Combine

Secondary School

\[
\begin{array}{ccccccc}
0 & 5 & 10 & 15 & 20 & 25 \\
\end{array}
\]

Figure 2. Dendrogram using Ward Method (Secondary Schools)
Table 3: Group differences in perceived principal leadership, school culture, teacher empowerment, students’ attitudes to learning, teacher morale, job satisfaction, and organizational commitment among teachers from schools of different clusters (secondary schools).

<table>
<thead>
<tr>
<th>Cluster (Secondary) Teachers</th>
<th>Number of Teachers</th>
<th>Teachers’ Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Principal Leadership</td>
</tr>
<tr>
<td>1 (4 schools) (P, L, V, O)</td>
<td>219 Mean(\text{SD})</td>
<td>3.616(\text{a}) 1.196</td>
</tr>
<tr>
<td>2 (3 schools) (Q, S, R)</td>
<td>166 Mean(\text{SD})</td>
<td>4.426(\text{b}) 1.016</td>
</tr>
<tr>
<td>3 (6 schools) (U, M, X, W, T, N)</td>
<td>313 Mean(\text{SD})</td>
<td>4.683(\text{c}) 0.952</td>
</tr>
<tr>
<td>Total</td>
<td>698 Mean(\text{SD})</td>
<td>4.287 1.146</td>
</tr>
</tbody>
</table>

Univariate ANOVA

<table>
<thead>
<tr>
<th>F test</th>
<th>df</th>
<th>Sig. level (p&lt;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>68.54</td>
<td>2.695</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Notes: Higher scores indicate more favorable ratings. Similar group means were indicated by the same superscript and different group means were indicated by different superscripts in each column.

Group differences were also found in the student measures. MANOVA showed significant differences in the three sets of students’ measures: Student Learning and School Climate (Wilks’ \(\lambda\)=.981, F(8, 11272)=13.66, p<0.001), Quality of School Life (Wilks’ \(\lambda\)=.984, F(10, 11234)=9.10, p<0.001) and Self-concept (Wilks’ \(\lambda\)=.991, F(4, 11286)=12.65, p<0.001). Results of univariate ANOVA were summarized in the last row of Table 4. There were significant differences in almost every subscale except in the subscales of Adventure and General Satisfaction. Following the same conventions in the above tables, post hoc group mean comparisons were indicated by superscripts, different group means were indicated by different superscripts, whereas comparable group means were denoted by the same superscript in each column. In general, students in schools in Cluster 3 (Secondary) reported more favorable ratings than that in schools in Clusters 1 (Secondary) and Cluster 2 (Secondary). In addition, students in Cluster 2 (Secondary) schools reported higher ratings on (perceived) Teacher Support than that in Cluster 1 (Secondary) schools.

In sharp contrast to that of the primary students, there were a much greater number of group differences in many of the psychological measures (e.g., Student Learning and School Climate, Quality of School Life, and Self-concept) among students in different groups of secondary schools. The results probably reflected that there was a much greater diversity in the student characteristics in secondary schools than that in primary schools in Hong Kong as a consequence of the adoption of a highly ability-segregated secondary school places allocation system in secondary one.
<table>
<thead>
<tr>
<th>Cluster</th>
<th>Number of (Secondary) Students</th>
<th>Student Learning and School Climates</th>
<th>Quality of School Life</th>
<th>Self-concept</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Active Learning</td>
<td>Powerful Learning</td>
<td>Teacher Support</td>
</tr>
<tr>
<td>1</td>
<td>1610</td>
<td>Mean: 2.570&lt;sup&gt;a&lt;/sup&gt;, SD 0.713</td>
<td>2.811&lt;sup&gt;b&lt;/sup&gt;, SD 0.648</td>
<td>2.541&lt;sup&gt;d&lt;/sup&gt;, SD 0.622</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4 schools) (P, L, V, O)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1277</td>
<td>Mean: 2.520&lt;sup&gt;a&lt;/sup&gt;, SD 0.727</td>
<td>2.857&lt;sup&gt;b&lt;/sup&gt;, SD 0.692</td>
<td>2.600&lt;sup&gt;c&lt;/sup&gt;, SD 0.672</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3 schools) (Q, S, R)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2773</td>
<td>Mean: 2.558&lt;sup&gt;a&lt;/sup&gt;, SD 0.667</td>
<td>2.917&lt;sup&gt;b&lt;/sup&gt;, SD 0.651</td>
<td>2.689&lt;sup&gt;c&lt;/sup&gt;, SD 0.616</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(6 schools) (U, M, X, W, T, N)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5660</td>
<td>Mean: 2.553, SD 0.694</td>
<td>2.874, SD 0.661</td>
<td>2.627, SD 0.634</td>
</tr>
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</table>

Univariate ANOVA

<table>
<thead>
<tr>
<th>F test</th>
<th>df=5658</th>
<th>Sig. level (p&lt;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.02</td>
<td>n.s</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Notes: Higher scores indicate more favorable ratings. Similar group means were indicated by the same superscript and different group means were indicated by different superscripts in each column.
Qualitative analysis (secondary schools)

Cluster 1. All schools in Cluster 1 receive primarily band 3 students in their secondary one intake. Teachers in Cluster 1 schools described their students as weak in academic ability and poor in discipline. In general, the teacher and student relationships were moderate to poor as reported by both the teachers and the students. In addition, some students reported that there were very few good lessons in the classroom. Some parents said that they would not recommend this school to their relatives or neighbours because the academic standard of the school was low and the reputation of the school was poor. On top of the above problems, several critical issues were also identified in the stocktaking interviews. First, the performance of the students in the Hong Kong Certificate of Education Examination (HKCEE) was poor both in terms of value-added and absolute passing rates. Second, there were complications in school communications and administration—the school communications were generally top down and many school policies were enforced with limited consensus. Thirdly, there was a general perception of overload in work and disagreement in work allocation. The developmental issues in these schools were the unity of teachers, team building, student caring and school discipline, and effective teaching and learning.

Cluster 2. Cluster 2 schools receive primarily band 3 students in their secondary one intake. Teachers in Cluster 2 schools appeared to be more receptive to the academic and behavioral weaknesses of the students. The teachers reported that they had developed acceptable to reasonably good relationships with the students. And similar feelings were shared by the students and their parents. Some parents described that many teachers were very much caring and good to the students, therefore, they would recommend their relatives and neighbours to consider this school if the child was not very much strong in academic ability. However, some students criticized that the discipline in some of the classrooms were poor. Students in Cluster 2 schools had below-average to average performance in terms of value-added in the public examination (HKCEE). In Cluster 2 schools, some stakeholders brought up a number of issues in management and school culture. But the nature and complications of the issues seemed to be less severe than that in Cluster 1 schools. The emerging themes for school improvement were thus classroom management, teaching and learning, and school management.

Cluster 3. Cluster 3 consists of a few band 2 schools and one or two band 1 schools. These schools were very much alert of their slight advantage in student intake in secondary one and attempt every effort to maintain this advantage. In general, the teacher-student relationships and teacher-teacher relationships were moderate to good, and there was moderate to strong collegial support in school. A common theme that
popped out as the key concern of Cluster 3 schools was the strong plea for enhancement in student performance in public examinations (HKCEE & the Hong Kong Advanced Level Examination, HKALE). And interestingly, all these schools employed almost the same strategy of giving additional lessons to their senior students (S4-7) beyond the normal lesson schedule (e.g., after school or in long school holidays). Some students reported that they experienced high stress in their studies. In one to two Cluster 3 schools, some students reported that the school has biased to the good classes, and relatively less attention has been given to the weak classes in the school. In spite of the above dissatisfaction, the majority of the students and their parents were very much willing to recommend the school to their relatives and their neighbours.

The results of the quantitative and the qualitative data converged to show that schools in different Clusters (Secondary) are facing with diversified challenges. Schools in Cluster 3 (Secondary) have a strong academic background and take in the academically advanced secondary students in Hong Kong. The teachers in these schools adopt primarily traditional and examination-oriented teaching approaches. Some of them work very hard, possess strong instructional skills, and give plenty of references and supplementary materials to the students. The students are well-behaved, hard-working and well-performed in public examinations. Some schools are reputable for their academic success and student conduct. These schools manage to keep up their superiorities and advantages in student performance and student intakes. Teachers in these schools generally have good feelings on their present situations, and are satisfied with their teaching approaches as well as students’ performance in public examinations and classroom learning. They do occasionally comment on the passivity of the students in learning, however, they also comment that their students are capable of doing what they are expected to do. In general, the school as a whole reacts strategically to the key concerns of educational reform in issues such as the “project-based learning”, “moral and civic education”, “facilitate teaching through informational technology”, and “reading to learn”. Strategically, the QSI improvement team fits in and works with the teachers on issues of teaching and learning such as “the Use of ‘Mr. Incredible’ in English Teaching”, “Using Photos as a Medium of Teaching Chinese Writing”. The approach is welcomed by the school and the teachers. Sometimes, the teachers are very much open in mind and willing to change when they witness the remarkable changes of the students in their learning behaviors.

Schools in Clusters 2 and 1 (Secondary) accept students of similar socio-economical background and academic ability (low SES & primarily band 3), they are likely facing similar challenges such as challenging student behaviors, weak academic background,
low learning motivation, and poor parental support. But it appears that the two clusters of schools have adopted different strategies for school improvement. Schools in Cluster 2 (Secondary) are much more concerned about the well-being of the students and emphasize the creation of a supportive and caring school environment that would foster social and emotional development of the students. These schools request professional support and advice on topics like “Fostering a Caring Classroom Environment for Personal Development” or “Creating Positive Discipline in School”. In comparison, schools in Cluster 1 are struggling in maintaining acceptable classroom order and acceptable academic achievement. The qualitative data revealed that some of the schools in Cluster 1 are also complicated by issues of weak principal leadership, inharmonious staff relationships, internal conflicts between departments, and etc. To these schools, the QSI team focuses on issues of principal leadership, effective school communication, and vision building as the critical issues for school improvement.

Discussion

Using measures of teachers’ perceptions on principal leadership, school culture, teacher empowerment and students’ attitudes to learning as criterion variables, schools have been successfully classified into different states or profiles for school development. The validity of the classification is further confirmed by the following evidences: (i) significant group differences on the criterion measures; (ii) significant group differences on other teacher measures such as job satisfaction and organizational commitment; (iii) significant group differences on some key student measures such as student learning and school climates; and (iv) differentiated and systematic patterns of school and teacher characteristics derived from qualitative data.

On the other hand, the study also identifies principal leadership, school culture, teacher empowerment, and (perceived) students’ attitudes to learning as important factors for school improvement and provides a strong empirical test on the discriminant and predictive validity of the relevant measures.

Consistent with a priori predictions, schools with different ‘initial states’ or ‘capacity’ appear to have differentiated but systematic developmental needs. Taking the classification of primary schools as an example, schools with strong principal leadership, supportive school culture, empowered teachers, and positive students’ attitudes to learning have already achieved a relatively high standard in their provision of learning experiences to their students. Teachers in these schools are generally strong, when they are exposed to better educational practices, they learn quickly and are able to perform even better. In comparison, teachers in the less favorable
conditions, such as those in the relatively weak primary schools, may need to learn to transform their instructional approach from a primarily traditional orientation to a more encouraging and stimulating orientation. To many teachers, such transformation may mean a great change to his/her usual teaching practices, the change process would probably be slow, zigzagged, and need to be facilitated by a strong external support. Therefore, the assessment of the school initial conditions and teacher capacity provides the essential and fundamental information for effective school improvement.

In view of the very diverse needs of the project schools, the QSIP team adopts both “Big-Wheels” and “Small-Wheels” processes in a very flexible, dynamic, interactive, and context-specific approaches to school improvement. For examples, teachers in high-ability schools are very much fond of improving academic achievement. The “Small-Wheels” process, which focuses on subject improvement (such as “the Use of ‘Mr. Incredible’ in English Teaching”, “Using Photos as a Medium of Teaching Chinese Writing”, “Drama Education in Liberal Studies”, and “class visits and lesson observations”), provides a platform for collaboration and interflows of ideas between teachers and School Development Officers of QSIP. The collaboration could then be extended to include school-wide issues such as school development planning, school self-evaluation, and etc. However, in some other schools where issues of school culture, internal conflicts and ineffective principal leadership pop out as the major concern and worries of the school, an immediate intervention and support in tackling these issues would be strategically more effective and appropriate. In these cases, the “Big-Wheels” process that focuses on vision-building, team-building, and transformation of school culture would prevail. Therefore, the “Big-Wheels” and “Small-Wheels” processes provide alternative, mutually complementary and reinforcing improvement strategies for school improvement.

Although this study has demonstrated very systematic patterns of developmental states and needs for different clusters of schools, we are not saying that the “individuality” or the uniqueness of individual school within the same cluster could be ignored. In fact, school improvement is extremely context-specific, people-specific, time-specific, and content-specific for every school. It is evident that there is no simple and unique formula that could apply for all in school improvement (e.g., Chiu, 2003a, 2003d). However, the findings of this study, together with other previous studies (Chiu, 2003a), provide a general understanding of the complications of school improvement and some useful guidelines for selecting development strategies for different clusters of schools. And most importantly, this study reiterates the significance of assessing the initial conditions and school capacity for
effective school improvement and the QSIP “stocktaking” exercise represents one of the effective and efficient approaches to accomplish the task.

References


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