

# Management Strategies for Promoting Teacher Collective Learning

Eric C. K. Cheng

The Hong Kong Institute of Education, Hong Kong, China

This paper aims to validate a theoretical model for developing teacher collective learning by using a quasi-experimental design, and explores the management strategies that would provide a school administrator practical steps to effectively promote collective learning in the school organization. Twenty aided secondary schools in Hong Kong were selected by cluster sampling, and 777 teachers took part in the questionnaire survey. A structural equation model was applied to identify the interrelationship of the 5 disciplines of Senge's (1990) learning organization model. Results showed that personal mastery and systems thinking are individual and collective level predictors respectively for teacher collective learning. Building a mental model and shared vision in a sequential order predict systems thinking. Management strategies in cultural, policy and leadership domains are recommended to school administrators who wish to promote teacher collective learning as a means of coping with the changes generated by the curriculum reform in Hong Kong.

*Keywords:* teacher collective learning, school management strategies, learning organization

## Introduction

Teacher collective learning is a critical factor for teacher professional development and school development in education reforms (Verbiest, et al., 2005). Secondary schools in Hong Kong have long been preparing for the new senior secondary curriculum, in which senior secondary schooling has been restructured into a 3-year curriculum. Schools have been seeking ways to sustain their development by enhancing the professional competency of teachers. Teachers are facing challenges in acquiring the pedagogical content knowledge required for implementing the new curriculum. Collective learning enhances professional competence of teachers and creates the pedagogical content knowledge necessary for implementing the new curriculum (Cheng, 2009). If school administrators are serious about school sustainability, they should enhance the professional competence of their teachers, cultivate a cooperative learning culture and facilitate a work-based platform for collective learning and knowledge sharing among teachers (P. Hodkinson & H. Hodkinson, 2005).

Collective learning is the learning process and outcome achieved when members of a community learn by social interaction (Simons & Ruiters, 2001). More than simple group attendance at classes and seminars or shared instructional materials, collective learning is a process by which the members share their values and beliefs during the collective learning process. Collective learning is synergistic, which refers to the continual

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Eric C. K. Cheng, Ed.D., assistant professor, Department of Education Policy and Leadership, The Hong Kong Institute of Education.

enhancement of collective capacities and the improving of team effectiveness (Senge, 1990). With teacher collective learning, teachers are together able to suspend individual assumptions about their pedagogy. They are also able to engage in a free and open dialogue about the essence, nature, challenges and operations of their work. Teachers learn more effectively when they interact with others and learn together as a team. For this reason, collective learning is more important than individual learning.

Collective learning is important for both the school development and the individual professional development. School development and teacher collective learning depend on one another. Views on school improvement have made clear that the development and realization of policies and reforms in schools call for the collective learning of teachers (Verbiest, et al., 2005). These learning processes must be supported by the school administration to be successful. School administrators should seek ways to develop the professional competency of teachers and empower them to exercise their expertise to promote school development. Facilitating teacher collective learning in a school organization through strategic management is therefore critical to school development.

This study intends to construct an empirical teacher collective learning model and discuss the management strategies for promoting teacher collective learning in the context of Hong Kong secondary schools. Senge's (1990) model depicting 5 disciplines of organizational learning was adopted as the theoretical framework of this study. These 5 disciplines provide a conceptual framework for school administrators to practice their leadership and exercise management strategies that promote collective learning in their schools. Few empirical studies based directly on Senge's 5-discipline model of a learning organization have been conducted to explore the interrelationship among the disciplines. It is hoped that this research will provide certain insights for those schools that aim to create collective knowledge for tackling the challenges arising from the reform through teacher collective learning. The study contributes theoretically to the knowledge base of managing teacher collective learning by constructing an empirical model, and provides practical management strategies that shed light on steps which can be taken to develop schools into learning organizations.

### **Literature Review**

Collective learning refers to the continual enhancement of collective capacities and the improvement of team effectiveness (Senge, 1990). Learning is a process whereby a person or a group of people enhance their capacity to produce the results they want to produce. The pillar of a learning community is not individual learning, but collective learning. The only learning that matters is in groups, because the results produced by an organization are produced collectively. Knowledge that is generated at the collective level involves diffusion, dialogue, differentiation and deliberation among the various members of that group. This is very different from the personal knowledge and insights generated by an individual learning alone. However, collective learning cannot be completely separated from individual learning. It is also well recognized that individual learning does not guarantee collective learning. The mere compilation of the personal knowledge of community members is not collective learning. For effective collective learning to take place, members must suspend individual assumptions about their work and think together. When a decision is dictated by a single individual or oligarchy in a community, the knowledge thus generated cannot be labeled as collective, as no genuine learning and sharing has occurred.

#### **Five Disciplines for Collective Learning**

Senge (1990) defined organizational learning as a group of people continually enhancing their capacity to

create what they want to create. He defined a learning organization as one that possesses 5 core learning disciplines, namely, personal mastery, mental models, shared vision, team learning and systems thinking. The combination of these 5 disciplines forms a collective learning school organization. The meanings of the 5 disciplines of a learning organization (Senge, Ross, Smith, Roberts, & Kleiner, 1994, p. 6) are as follows:

(1) Personal mastery refers to the ability to continually focus one's energy on understanding the reality of the work. With personal mastery, members are willing to deepen their vision of the work and seek the reality and future of the work objectively. They are patient in their learning about the work;

(2) Mental model refers to the continual willingness to examine and re-examine the relevance and usefulness of one's mental models about the work at large and/or the particular area of one's work. Members effectively scrutinize their assumptions and generalizations about the work and leave these open to the scrutiny of others;

(3) Shared vision refers to the continual building of a consensus view of what the work should be and how it should be done. The essence of building a shared vision among teachers is in sustaining an on-going process that aims to inculcate in the whole school a sense of commitment, a desire to achieve recognized goals and to create a sense of ownership;

(4) Team learning implies the continual enhancing of collective capacities and the improving of team effectiveness (Senge, 1990). Organization members must be able to suspend individual assumptions about the work and think together. They must also engage in a free and open dialogue about the essence, nature, challenges and operations of their work;

(5) Systems thinking refers to the capacity of being able to see interrelationships among the parts in the work system rather than only and in addition to linear cause-effect relationships. Members are able to see continuous processes rather than snapshots of work activity.

Although Senge (1990, p. 21) suggested that these 5 disciplines should be developed together because when these 5 disciplines are applied to the context of a school, the sequential interrelation among the 5 disciplines is important. In this study, team learning is conceptualized as collective learning, which will be predicted by the other 4 disciplines. Personal mastery in an individual teacher is conceptualized as the element at the individual level of learning which is expected to predict collective learning. Senge (1990) advised people to put aside their old ways of thinking, and to learn to share their personal knowledge with others. Individual ability and willingness of learning are necessary conditions for teacher collective learning. Elements at the collective level which predict collective learning include the mental model, a shared vision and systems thinking. Building a mental model based on trust among team members is the fundamental basis for articulating a shared vision. A shared vision provides a working direction for teachers and enables them to understand the organizational arrangements, routines and systems. If school administrators involve teachers in articulating a shared vision and in participating in decision-making, then systems thinking, that is, the capacity to see the whole and the parts, will be nurtured. Based on the articulation of Senge's 5 disciplines, a theoretical model of teacher collective learning is constructed (see Figure 1).

The theoretical model consists of the disciplines at an individual level and a collective level which predict teacher collective learning. This study attempts to validate this model and explores corresponding management strategies that can nurture all the 5 disciplines. School administrators may consider applying strategic management to promote teacher collective learning. Strategic management involves a scrutiny of the organizational environment, and strategic implementation of at the cultural, policy and leadership levels (Bailey & Johnson, 1992).

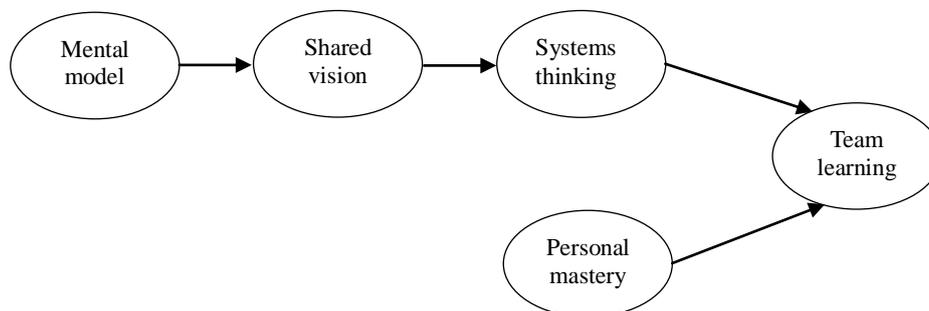


Figure 1. Theoretical model of the study.

### Management Strategies

Little research has been done in the field of school management strategies and leadership to identify the supporting conditions which promote teacher collective learning in a school organization. Hords (1997) postulated a set of supporting conditions to facilitate collective learning in a professional learning community, which includes a shared and supportive leadership, shared values and trust, and the provision of resources. Johnston and Caldwell (2001) identified a set of factors that support the development of a learning organization, which includes a culture of collaboration, effective communication channels, professional development programs and learning focused leadership. In a study of the transforming of a school into a learning organization, Leithwood (1998) proposed transformational and shared leadership to reinforce teacher collective learning. To cultivate a community of practice for collective learning, Wenger (1998) emphasized the social relationships among members that create a shared domain and mutual engagement, which will result in knowledge transfer. Taking a knowledge management perspective, Nonaka and Takeuchi (1995) stressed the significance of organizational vision for knowledge creation within an organization. To facilitate organizational learning, Senge (1990) suggested school administrators should exercise shared leadership to build a shared vision with teachers. The above strategies supporting collective learning can be categorized under Bailey and Johnson's (1992) cultural, leadership and policy aspects of management strategies, which include cultivating a culture of trust and collaborative learning, formulating school-based policies for teacher professional development and shared decision-making, and exercising shared and supported leadership for teacher empowerment. These conditions seem to be embedded in the philosophy of Senge's 5 disciplines for a learning organization.

### Investing in Professional Development for Personal Mastery

Investing in teacher professional development could be an effective strategy for developing teacher personal mastery (Hord & Sommers, 2008). When teacher professional competency is enhanced, teachers will have the capacity to contribute their personal knowledge to the learning community during the collective learning process. School administrators can create job requirements and provide opportunities for professional development that make learning about learning mandatory. School administrators may formulate certain job-embedded professional development policies or set up working teams to deal with the practices of the discipline of personal mastery. Job-embedded professional development strategies should be based on the principle that adult learners respond best when dealing with real-life situations and problems, a fundamental professional development approach in facilitating teacher collective learning (DuFour, 2004). Teachers may be invited to share experiences among themselves, or even to demonstrate to their colleagues what they have learnt on courses or in seminars. The establishment of a professional learning community is a good means of

enhancing teacher personal mastery. Experienced teachers can serve as mentors to novice teachers, so that novice confidence in areas of expertise and knowledge can be built up and reinforced as time goes by.

### **Building a Mental Model Based on Trust**

A mental model consists of the deeply ingrained assumptions or generalizations that influence how one understands the world and takes action (Senge, 1990). Sharing one's own mental model is a pillar of the 5 disciplines of Senge's work on teacher collective learning. The knowledge possessed by an individual teacher and his/her mental model of knowledge sharing will affect his/her collective learning. Sharing of a mental model is based on trust, which is a building block of an organization (Whaetley & Kellner-Rogers, 1996). Building a mental model based on trust is an essential factor in building the high-quality relationship needed to foster collaboration in schools. It assists the creation of a shared vision and eventually systems thinking will be nurtured. Implementation strategies for improving the mental model include the cultivation of trust and inquiry-based reflective learning for knowledge sharing.

Teachers require the existence of trust in order to respond openly and share their knowledge (Gruenfeld, Mannix, Williams, & Neale, 1996). School administrators should promote trust in their schools by first fostering trust between themselves and their teachers. Literature on trust supports the view that when there is a higher level of trust, people are more likely to share knowledge (Zand, 1972; Andrew & Delahay, 2000), and more willing to absorb knowledge (Mayer, Davis, & Schoorman, 1995). Effective knowledge transfer requires mutual trust among people (Politis, 2003; Panteli & Sockalingam, 2005). Trust is an essential ingredient in any knowledge sharing activity (Mayer, et al., 1995; Dirks & Ferrin, 2001). Wherever people are working together, the relationship between trust and the ability to transfer knowledge to others appropriately will exist. Trust among staff in a school organization is a critical element necessary to increase student achievement (Bryk & Schneider, 2002) and with trust, collective learning will take place and learning communities will be built.

### **Exercising Shared Leadership to Articulate a Shared Vision**

The discipline of a shared vision refers to the continual building of consensus regarding what the work should be and how it should be done. The essence of building a shared vision among teachers is to sustain an on-going process that aims to inculcate in the whole school a sense of commitment, and a desire to achieve recognized goals and a sense of ownership. School administrators must have a personal vision regarding how leadership will be provided for the school before working with staff to develop a shared vision for the entire school (Owen, 2004). The transmission of the vision is usually done via official meetings, the school annual plan, disseminated documents, or by frequent reviews of student performance and school effectiveness. Members focus on fostering genuine commitment and enrolment rather than compliance.

Senge (1990) stressed the fact that vision could not be sold. If a shared vision is to develop, members of the organization must cooperate in the building of such a vision. School vision must not be created solely by administrators or imposed from the top down; rather such vision must be created by means of a comprehensive interaction among the individuals in the school and through challenging and on-going dialogue. It is only by reaching a compromise among the individuals and by further developing the vision as a common direction, that a shared vision may be honored with the teachers' commitment. When teachers have actually participated in building the mission and vision of the school, they will possess a strong sense of ownership, which in turn will encourage them to work towards the school goals with enthusiasm. School administrators must, on a continuous basis, share their own vision with the teachers, be assessed on their commitment to the vision, and

be sufficiently open-minded to accept and welcome divergent opinions. Implementation strategies to articulate a shared vision could include engaging staff with administrators in conversation about a new practice and why it could be useful to the school or how it will fill some agreed-upon need.

### **Empowering Shared Decision-making for Systems Thinking**

Seeing the school organization as a whole rather than a collection of parts is essential for collective learning. School administrators should strive for regular collegial interaction in the face of system problems and school resistance to change. Shared decision-making should aim at reforming educational practices by creating conditions in schools that facilitate improvement, innovation and continuous professional growth. Literature on restructuring generally favored shared decision-making (Cheng, 2008). Shared decision-making was perceived as forging links between administrators and teachers (Sergiovanni, 1992). Teachers from different groups with different value systems can be invited to share their values with the administration team to exercise systems thinking. This will help build up a holistic appreciation of the domain of work as well as the processes that make up the bigger system of the work.

### **Professional Dialogue for Collective Learning**

Team learning refers to the continual enhancing of collective capacities and the improving of team effectiveness (Senge, 1990). Under a process of collective learning, teachers are able to suspend individual assumptions about the work and think together. They are also able to engage in a free and open dialogue about the essence, nature, challenges and operations of their work. In the present study, the discipline of team learning is conceptualized as teacher collective learning. In team learning, teachers have to work in collaboration with one another, to learn from one another, to learn together and to reinforce the team's learning (Leithwood, 1998). Teachers learn more effectively when they interact with other teachers and learn together as a team.

## **Research Methods**

This study aims to validate a theoretical model for developing teacher collective learning by using a quasi-experimental design, and explores the management strategies that would provide a school administrator with practical steps to effectively promote collective learning in the school organization. A self-response quantitative questionnaire survey was designed to collect data from secondary school teachers in Hong Kong. The data were directly collected from target subjects through the questionnaire. A SEM (structural equation model) was applied to examine the factor structures and the paths among the variables by using Lisrel 8.3 (Joreskog & Sorbom, 1999). The SEM is a collection of statistical techniques that allows the examination of a set of relationships between independent variables and dependent variables.

### **Instruments**

An instrument was developed to investigate how teachers perceived certain issues. Section 1 of the questionnaire collected the background information of the respondents. Teachers were asked to provide demographic information as part of the self-report questionnaire, i.e., gender, teaching experience, education level and administrative duties. Section 2 of the questionnaire contained 10 issues and was designed to measure the 5 disciplines of the learning organization model. The content of the 5 disciplines was based on a careful examination of the literature. The statements representing these leadership domains were adapted from Senge. The research questions stipulate some notion of distance in the theorizing and often assume the equal spacing of the interval scale. The data were treated as an interval scale. All items in section 2 and 3 were measured

using a 6-point Likert-type scale ranging from 1 (Strongly disagree) to 6 (Strongly agree). Teachers were asked to indicate the extent to which they perceive their learning behavior regarding the 10 items.

### Sample

The subjects in the study were teachers from aided secondary schools in Hong Kong. There are 473 secondary schools in Hong Kong, of which 90% of are aided schools, 5% are government schools, and the other 5% are direct subsidy schools. All of the schools fall under the governance of the education department through the education ordinance and education regulations. Only aided secondary schools were chosen in this study, because they form the major school sector and form a homogeneous group. All aided schools have local school management committees and are governed by the codes of aid. The codes of aid set out requirements on such matters as accounts, admission of pupils, staff appointments and staff dismissals. Accompanying education regulations set out detailed requirements on such matters as furnishings, safety precautions, class size, toilets and school holidays. All aided schools have been required to fully implement SBM since 2000.

The sample was drawn from 20 aided secondary schools (5% of total schools). The schools were selected by cluster sampling. This sampling method is preferred when the population is very large or spread out over a wide geographical area, as in Hong Kong. It involves less time, less expense and is generally more convenient. There were small differences among the group means and the group variances, thus, a cluster sample was more appropriate than a stratified sample. The 20 sampled schools were drawn in proportion to the total number of schools in each district according to the Education Bureau's list of schools. Ten schools were drawn from the new territories, 5 schools were drawn from Kowloon Peninsula, and the other 5 were drawn from Hong Kong Island. Sixty teachers in each sample school were selected, resulting in a total of 1,200 teachers. Of these, 777 responded to the questionnaire.

### Data Collection Procedures

After obtaining approval from the targeted school principals to conduct the survey, and appointing a staff member to take charge of the distribution and collection of the questionnaires in the schools, the package materials were sent by mail to the targeted schools. The package contained the questionnaires, covering letters explaining the purpose of the survey and assuring complete commitment to ethical research principles, and instruction sheets. The completed questionnaires were then collected by the appointed researcher coordinators of each school and sent back to the researchers.

## Findings

The structural and measurement coefficients from the completely standardized solution under maximum likelihood estimation are presented in Figure 2. The goodness of fit statistics is shown in Table 1. All paths in the model were significant at the 0.05 level according to the Z statistics:

- (1) Mental model and shared vision ( $\gamma=0.34$ );
- (2) Shared vision and systems thinking ( $\gamma=0.87$ );
- (3) Systems thinking and team learning ( $\gamma=0.91$ );
- (4) Personal mastery and team learning ( $\gamma=0.09$ ).

The hypothesized model is a good fit to the data. The results of the Lisrel with the 777 participants showed that the chi square value was not significant for the overall model,  $\chi^2(N=777)=26.23$ ,  $P=0.56055$ . As an absolute fit index, the chi-square assesses the discrepancy between the sample covariance matrix and the

implied covariance matrix based on the hypothesized model. A non-significant chi-square suggests that the model may be a reasonable representation of the data. However, the assessment of fit using the chi square test is confounded by sample size. When the sample size is large, the small difference between the sample covariance matrix and the reproduction covariance may be found significant.

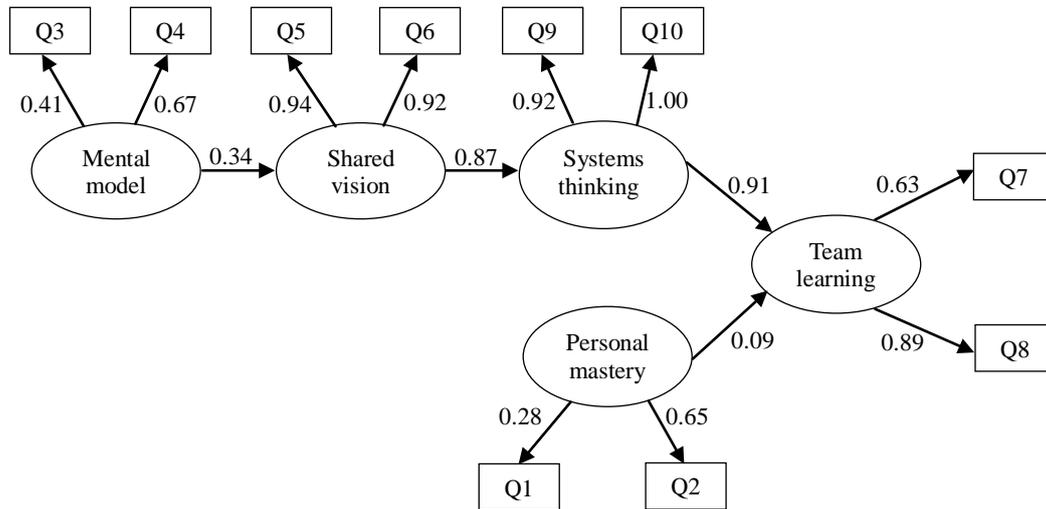


Figure 2. Result for the structural model.

Table 1

*Goodness of Fit Statistics of the Structural Equation Model*

$\chi^2$	df	p-value	RMSEA	SRMR	CFI	NNFI	IFI
26.23	28	0.56055	0.000	0.020	1.00	1.00	1.00

Notes. RMSEA (root mean square error of approximation); SRMR (standardized root mean square residual); CFI (comparative fit index); NNFI (non-normed fit index); and IFI (incremental fit index).

The relative-fit index and residual-based indexes are two types of additional fit indexes used widely to complement the chi-square. Relative-fit indexes include a CFI, NNFI and an IFI. These indexes measure the relative improvement in fit by comparing a hypothesized model with a base-line model. The base-line model is an independence model in which all variables are expected to be uncorrelated. These indexes range from zero to one, with larger values indicating a better fit. They should be at least larger than 0.9 for a reasonable goodness of fit. In the present study, the indexes are: CFI=1.00, NNFI=1.00 and IFI=1.00, which suggest a reasonable fit between the data and the hypothesized model.

Other than relative-fit indexes, residual-based indexes can also be used. The SRMR measures the average value across all standardized residuals between the elements of the observed and implied covariance matrices. The RMSEA assesses the absence of fit because of model mis-specification and provides a measure of discrepancy per degree of freedom (Browne & Cudeck, 1993). The SRMR ranges from zero to one, though there is no upper limit for the RMSEA, and smaller values indicate a better model fit. A value of 0.08 or less for the SRMR and a value of 0.06 or less for the RMSEA indicate an adequate fit (HU & Bentler, 1999). In this study, the SRMR=0.020 and the RMSEA=0.0 (90% CI. 0.0; 0.026), given that this is a stringent model in which the correlations among all measurement errors were not set free, these fit statistics indexes show that the model fit the data fairly well. The covariance matrix of the 5 latent variables is shown in Table 2.

Table 2

*Covariance Matrix of Latent Variables*

	Systems thinking	Shared vision	Team learning	Mental model	Personal mastery
Systems thinking	1.00				
Shared vision	0.87	1.00			
Team learning	0.93	0.82	1.00		
Mental model	0.30	0.34	0.36	1.00	
Personal mastery	0.29	0.34	0.35	0.98	1.00

### Discussion

The results of the study showed that the theoretical framework is validated by the SEM, in which the concepts of Senge's 5 disciplines of organizational learning coexist in school and could be explained by the proposed model. The path model shows that there are predictive effects of personal mastery (0.09) and systems thinking (0.91) on teacher collective learning. Mental model (0.34) is the predictor of shared vision, along this path, and shared vision (0.87) is the predictor of systems thinking (see Figure 2). In this model, personal mastery and systems thinking were confirmed as the direct predictors of teacher collective learning. These showed that collective learning depends on both the individual teacher's pedagogical competency and their ability to conceptualize a holistic view of the interrelationships among jobs in the school organization. The effect of systems thinking (0.91) to predict collective learning is far greater than the effect of personal mastery (0.09). This reflects the power of systems thinking, that is, seeing the whole and the parts, to boost collective learning. According to Senge (1990), system thinking is the key discipline for achieving successful collective learning. This was also found to be true in the context of secondary schools in Hong Kong.

Systems thinking depends on creating a shared vision, while a shared vision is based on a mental model built on trust. If based on trust, a shared mental model can lead to a plan everyone can agree on and eventually create a shared understanding of how the organization really works. Members can then work together to achieve that vision. The essence of building a shared vision among teachers is to sustain an on-going process that aims to inculcate in the whole school a sense of commitment, a desire to achieve recognized goals and a sense of ownership. Creating a shared vision is critical to developing in teachers a holistic appreciation of the domain of the work as well as the processes that make up the bigger system of the work.

Descriptive statistics of the model show that, with the exception of systems thinking, the mean value of all the disciplines is higher than 4.00 (see Table 3). These findings show that the respondents slightly agreed that they are willing to deepen their vision of the work and see the reality and future of the work objectively. They tended to agree that they are using their own thinking to effectively scrutinize their assumptions and generalizations about the work and leave these open to the scrutiny of others. They slightly agreed that they can continually build a shared vision about what and how the work should be, and can suspend individual assumptions about the work and think together. However, the mean value of systems thinking is the lowest (3.80) among the 5 disciplines, which shows that the respondents can hardly see the interrelationships among parts in the work system rather than only and in addition to linear cause-effect relationships. If school administrators want their teachers to see interrelationships among parts in the school organization, the model suggests that school administrators should be handled strategically in school policy, cultural and leadership domains that allow teachers to collectively acquire, analyze, disseminate, store-code, retrieve and use successful professional practices relevant to their performance in school (Popper & Lipshitz, 1998). School administrators need to

formulate school policies, exercise shared and supportive leadership (Hord, 1997) and nurture a collegial and trusting culture (Hord & Sommers, 2008) to promote the development of the 5 disciplines.

Table 3

*Descriptive Statistics of the Variables*

	Systems thinking	Shared vision	Team learning	Mental model	Personal mastery
Mean	3.80	4.18	4.04	4.55	4.01
Standard deviation	0.99	0.94	0.83	0.63	0.80

**Strategies in the Policy Domain**

School administrators may formulate policy in teacher professional development to deal with the practice of the discipline of personal mastery and foster reflective practices via the development of professional learning communities to improve the mental model. Staff professional development programs should be coupled with a formative staff appraisal system to identify teachers' needs for formulating teaching learning activities at both school and individual levels. It would be desirable if teachers' participation in profession-related training activities could be stated in the school's annual plan as an essential issue fully supported by the school authority. Administrators should encourage teachers to participate in school-based reflective learning activities which target the creation of pedagogical content knowledge that will help teachers meet the challenges of the new era. Schools that intend to enhance the practice of the discipline of personal mastery among their staff members should aim at offering support and encouragement for individuals' on-going learning.

School administrators should also create a school structure and routines that support learning, and encourage regular collegial interaction in the face of system problems and school resistance to the practice of systems thinking. They would need to be committed to the school-based management policy that ensures that staffs share a clear vision for the school that involves all teachers in decisions about goals and missions. School administrators should also formulate strategies to help teachers acknowledge the relationship between things and operations. The most compelling of these strategies is the ability to see the world as a complex system. When teachers are able to appreciate the inter-relationship among the components of an event or an idea, they will then be able to make decisions that are better-informed. Teachers will not be interested in participation in the decision-making of activities if the annual school plans are determined by the senior management only and not shared by teachers. It should be in the interest of the administrators to encourage participation that provides more opportunities for teacher participation in planning and policy formulation, which will facilitate and commit teachers to systems thinking (Alavi & McCormick, 2004). Such involvement increases the consensus on goals and priorities, and breaks the narrow perception that many teachers may have when they are isolated in the classroom. Shared decision-making could therefore be a way to develop systems thinking.

**Strategies in the Cultural Domain**

School administrators are responsible not only for institutionalizing policies and resources that support collective learning, but also for nurturing a culture that ensures the productivity of collective learning (Popper & Lipshitz, 1998). Cultivating a culture of trust and organizational learning could be an effective method for developing a mental model built on trust- and reflection- based learning. School administrators should aim to nurture a culture of trust that encourages communication, support and collective thinking as a part of the learning process. All real collective learning efforts must come from within the members of the community for these to be effective. Trust is based on relationships. Trust building is a journey which starts from a

professional relationship in which clear roles and responsibility are defined, in terms of the team first, and then more personal relationships. Trust between people is associated with professional relationships rather than individual relationships. Trust can also be built without social cues within this concept (Meyerson, Weick, & Kramer, 1996; Jarvenpaa, Knoll, & Leidner, 1998). With a professional relationship, trust between team members is underpinned by clear understanding of each team member's roles, aims and responsibilities.

School administrators should also foster a culture of organizational learning in which members of the staff are able to present their points of view in thorough discussions before decisions are made. The shared mental model among members is crucial for the creation of a cohesive type of organizational culture. Relevant structures like dual channels of communication, evaluations, reflections and experience sharing would best suit the purpose of providing opportunities for teachers to work in collaboration with one another and to learn from one another.

### **Strategies in the Leadership Domain**

Any changes in a school must be accepted, appreciated and nurtured by the leader. In order to promote teacher collective learning, school administrators should be committed to their leadership role as change agents. Teachers have to be supported and equipped so that they are able to make the changes happen. School leaders have to cultivate an organizational culture that facilitates both the formal and informal learning processes, which are intrinsic to a learning organization (Marsick & Watkins, 1996; Marsick, 1987). They need to exercise a shared and supportive leadership to sustain collective learning that keeps the shared vision alive in communication and actions, and align professional development to support the change. School administrators must share their own vision with the teachers, be assessed on their commitment to the vision, and be sufficiently open-minded to accept and welcome divergent opinions. They need to empower teachers to make changes in their schools, promoting and publicizing the ideas put forward by members of staff, and reinforcing work and initiatives across different boundaries which are crucial to strengthening the professional development both of individual teachers and of the whole school (Mark & Louis, 1999).

### **Conclusion**

This paper contributes an empirical model of teacher collective learning in the context of secondary schools in Hong Kong. It extends knowledge of the management strategies for promoting teacher collective learning by providing practical guidelines for school administrators to lead a learning organization. It also reveals the power of systems thinking in fostering teacher collective learning in a school organization. If the school administrators are to implement management strategies based on Senge's 5 disciplines for promoting teacher collective learning, there is considerable work to be done. First, school administrators need to review the existing teacher professional development program and shared decision-making policy in their schools to ensure that teacher personal mastery and systems thinking are being developed. Otherwise, they should formulate school-based policy to involve teachers in professional development and shared decision-making. Second, they should nurture a culture of trust and empower teachers to create a shared vision with them. School administrators could build trust with teachers and school staff by always placing the interests of the pupils first, carrying out what has been agreed upon and acting in the interests of teachers. School administrators must have a personal vision regarding how leadership will be provided for the school before working with staff to develop a shared vision. Third, school administrators should exercise a supportive and shared leadership role. They must act as learners and work with teachers openly to discuss instructional problems and explore solutions to

the problems that they identify. The implementation of management strategies in school policy, cultural and leadership domains could be some of the ways to promote teacher collective learning in the curriculum reform in Hong Kong.

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