Beyond PD

Teacher Professional Learning in High-Performing Systems

Teacher Quality Systems in Top Performing Countries

LEARNING FIRST

CENTER ON INTERNATIONAL EDUCATION BENCHMARKING
LEARNING FROM THE WORLD'S HIGH PERFORMING EDUCATION SYSTEMS

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Beyond PD:

Teacher Professional Learning in High-Performing Systems

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How to Use This Report

This report and accompanying materials are designed as a resource for teachers, school leaders and policymakers wanting to improve teacher professional learning in their schools.

The report is accompanied by authentic tools that high-performing systems and schools have used to develop their professional learning as well as appendices that provide additional details on how policies in these systems work. Appendices two through five include brief background reports on each country studied. Users may freely borrow from these resources.

Following is an Executive Summary highlighting how high-performing systems integrate both adult learning and student outcomes within effective professional learning design.

Following the Executive Summary, the body of the report is organized in two parts. Part I outlines the strategy and policies at a system-level that make professional learning effective. Essentially, these systems embed quality professional learning in schools. It opens with a discussion of strategic reform of professional learning, and proceeds to outline three key policy reforms, namely: developing professional learning leaders; developing evaluation and accountability policies; and creating time and resources for teachers to pursue effective professional learning.

Part II outlines specific professional learning programs, with examples from high-performing systems that have operationalized them in schools. Much of this section focuses on implementation and the practical details of how these programs operate in schools.

At the conclusion of each chapter there is a summary box of relevant resources that are all available at the NCEE website www.ncee.org/BeyondPD/. These include links to appendices that provide more information on, for example, specific professional learning programs. There are also links to a range of professional learning tools, resources and forms from the systems discussed in this report. These include sample classroom observation forms, mentor hiring and training guidelines, frameworks for setting up learning communities, and example job descriptions of teacher leaders of professional learning.

Developing this report

This report illustrates how four high-performing systems—British Columbia (Canada), Hong Kong, Shanghai (China) and Singapore— developed their teacher professional learning.[1]

The starting point for this report was the global evidence base of what works to improve schools and professional learning. The report then concentrated on how these high-performing systems made use of this evidence base to operationalize effective professional learning. The authors conducted in-depth interviews with experts, policymakers, school leaders, teachers, training providers and other relevant stakeholders. (For a list of interviewees, see Appendix 1). Key resources included ministry documentation, program evaluations, independent reviews and a wealth of school-level documentation.

Culture and geography always influence policy and outcomes. But importantly, the same underlying strategies and policies that drove growth in Hong Kong, Shanghai, and Singapore also proved effective in British Columbia. The high-performing systems discussed are exemplars of professional learning. They were examined given their continued positions at the top of international student assessments. Policymakers and educators in these systems focus on teacher professional learning as a driver of their success in lifting student learning.

Many of these policies are detailed throughout this report, accompanied by descriptions of key professional learning programs. For example, many examples of Hong Kong's professional learning programs are detailed in Part II of the report. In total, this report provides pathways to turn the evidence base into effective practice that improves teaching and learning in schools.

Executive Summary

Executive Summary

At the end of the school year in the Surrey School District in British Columbia, a school principal prepares for his school's biennial performance conversation. The school principal knows what the focus of the conversation will be. The District superintendent, Jordan Tinney, is clear that school improvement must focus on specific structures of teacher professional learning. The school principal heads to his annual performance conversation knowing it will all focus on how much the school's improvement plans, resourcing, and school organization have increased the effectiveness of professional learning.

In Singapore, a school professional learning leader works with classroom teachers to ensure that their professional learning programs are actually improving classroom teaching so they can meet objectives set by their school principal.

At the same time, teachers in Hong Kong have spent the year following subject-specific improvement strategies that have required extensive collaborative work and frequent classroom observations.

At the start of the year, a new teacher in Shanghai is nervous as she prepares to face her class of 45 students for the first time. Her learning curve over her first weeks, months and years will be steep. She is both challenged and supported by two mentors: one provides subject-specific guidance, the other more general pedagogical development. Her classroom teaching is observed on a regular basis and she observes her mentors' classes so she can learn and work on those aspects of her teaching

that are most critical for her students. In between classes, she regularly attends research groups with other teachers to analyze specific research questions to improve teaching and learning in their classrooms. The new teacher quickly learns she must continually develop her teaching expertise. She will be supported through this process but she knows her career will only progress if she develops high-level expertise in her subject area.

For all of these people, professional learning is central to their jobs. It is not an add-on. It is not something done on Friday afternoons or on a few days at the end of the school year. Teacher professional learning is how they all improve student learning; it is how they improve schools; and it is how they are evaluated in their jobs. They work in systems that are organized around improvement strategies explicitly anchored in teacher professional learning.

The reasons for this are straightforward. High-performing systems focus on the professional learning practices that the evidence has consistently shown appreciably lifts teacher and student learning. (See Box 1 on page 8 for a discussion of the evidence on effective adult and professional learning).

This report draws lessons from education systems in British Columbia, Hong Kong, Shanghai, and Singapore on how to improve teacher professional learning. These systems are all high-performing systems. Figure 1 shows by how much students in these systems are ahead of students in the United States, Australia and the average of the European Union. For example, the performance of the

Figure 1 How Many Months Behind? Differences in PISA Performances, 2012

	U.S.			Australia			EU 21*		
	Read	Math	Sci.	Read	Math	Sci.	Read	Math	Sci.
Shanghai	22	39	26	18	32	19	22	34	24
Hong Kong	12	23	18	10	17	11	15	19	16
Singapore	14	27	17	9	20	9	14	22	14
British Columbia	11	12	15	7	5	7	12	7	12

* Unweighted Average

☐ < 1 year behind
☐ 1 to 2 years behind
☐ > 2 years behind

Figures represent the difference in performance (expressed in the number of months of school education) between students in the U.S., UK, EU 21, and Australia and four high-performing systems. Source: OECD, 2013

average 15-year-old student in the United States is 22 months behind their peers in Shanghai in reading literacy. The gap is even wider for science and stretches beyond three years for mathematics, according to the OECD Program for International Student Assessments.

The strategic approach adopted in these systems requires all professional learning to be developed around an improvement cycle in schools that is always tied to student learning. The cycle orients professional learning around the following steps:

1. Assess students' learning to identify their next stage of learning (at either an individual or school level),

2. Develop the teaching practices that provide for the next stage of student learning (and being clear what evidence supports this), and

3. Evaluate the impact of new practices on student learning so that teachers can refine their practice.

The improvement cycle is not new. It is based on the evidence of effective professional learning and has been successfully implemented in many school systems around the world. Professional learning programs in these systems are developed around this cycle, as explored in Part II.

But the improvement cycle has also failed many times. In isolation, it is insufficient for sustained reform. To make it effective requires a broad strategy with strong linkages between how leadership roles are structured, how resources are allocated, and the focus of evaluation and accountability measures.

High-performing systems transform the improvement cycle into a culture of continuous professional learning that, in time, turns schools into true learning organizations. At a school level this is achieved through a focus on the following key components:

1. School improvement is organized around effective professional learning (that reflects the principles of adult learning).

2. Distinct roles are created to lead professional learning in schools and throughout the system.

3. Schools and systems recognize the development of teacher expertise (with expertise regularly developed through school-based research of how to improve student learning and then shared and recognized across multiple schools and districts).

4. Teachers and school leaders share responsibility not only for their own professional learning but the learning of other teachers.

5. Collaborative professional learning is built into the daily lives of teachers and school leaders.

These components are clearly overlapping and cannot be easily isolated. Yet they provide an intuitive sequence to guide system-level policy development.

At a policy level, an explicit strategic focus on how professional learning should operate guides how schools are organized. This strategy provides a focus for key policies—such as leadership, evaluation and accountability, and resourcing that allows time for professional learning—that makes effective professional learning sustainable.

All of these factors create a shared responsibility for professional learning in schools, which is regularly reinforced by teacher evaluation and school accountability policies that have a focus on the quality of collaborative professional learning in schools. This ensures that collaborative professional learning is built into the daily lives of teachers and school leaders, which is reinforced by resourcing policies that free up teachers' time for collaborative professional learning.

There is considerable nuance to this strategy, which is discussed throughout this report. But it is clear that this significantly differs from many other systems around the world. A recent U.S. study found that teachers considered professional

collaboration as a separate activity, removed from daily teaching practice and not integral to improving student learning.[2] Internationally, the OECD found that, on average, more than 40 percent of teachers reported that they have never taught a class jointly, observed classes or provided feedback.[3]

Importantly, creating effective professional learning does not require a complete overhaul of education policy. High-performing systems developed effective professional learning in schools through incremental improvements. For example, Singapore did not implement all of its reforms in one go: it changed one aspect at a time over many years, pragmatically trying what worked and discarding what did not work until it achieved a finely balanced, interconnected approach.

Developing new professional learning leaders

In these high-performing systems, new professional learning leaders are developed at the school and system level. They are regularly trained alongside school principals so each school has multiple leaders to continually improve professional learning. In schools, they work closely with school principals and ensure that teachers' individual and collective professional learning is meeting school objectives.

While job titles vary across systems – they are school staff developers in Singapore and coordinators of inquiry in British Columbia – what is common is that they are peer leaders, chosen from the teaching force and sometimes remaining one of the teachers in a school. Individual teachers make behavioral shifts when they see colleagues – not just official leaders – role-modeling effective practices.

Numerous system-level leaders increase the effectiveness of professional learning. For example, a select cohort of master teachers in Shanghai and Singapore develops professional learning in their subject area.

Every other profession has a level of master practitioner. It is fundamental that high-performing school systems recognize specialist expertise among their teachers. These leaders are champions of the profession and of proven teaching practices. They set objectives, develop programs and train experienced teachers who hold key roles in developing other teachers in schools.

For example, the principal master teacher in English language in Singapore is the pre-eminent English language teacher in the system. She sets the standard for pedagogical expertise and leads the network of English language teachers, designing the professional learning that all teachers receive.

Evaluation and accountability that improves professional learning

Too often, policy reform debates are compartmentalized, falling either under the umbrella of school and teacher development or under school and teacher accountability. This is a false dichotomy: it reflects an outdated interpretation of both development and accountability.

In high-performing systems, evaluation and accountability are integral to the success of professional learning in schools. This is because evaluation and accountability focus not only on student performance, but also on the quality of instruction and professional learning.

A broader focus on accountability does not mean that repercussions are reduced. On the contrary, teachers in Shanghai will not be promoted unless they can demonstrate that they are collaborative. Similarly, mentors will not be promoted unless the teachers they mentor improve.

As teachers and school leaders move up their distinct career tracks in Singapore, the weighting placed on how they develop other teachers' skills in their performance review increases. In Shanghai, 360-degree performance management where teachers' peers and people above and below them in the school hierarchy have input to their performance places a strong emphasis on collaboration and professional learning. In addition, school accountability for professional learning is closely linked to the degree of autonomy the school can

exercise. If a district considers professional learning programs in Shanghai schools are considered to be of low quality then the district will take over much of the school's professional learning.

In each of these high-performing systems, evaluations of the quality of professional learning require data to be collected on which to base these judgments. Focus groups, surveys, and interviews of school leaders, teachers, parents and students provide a wealth of qualitative data that complements traditional student performance and input data. These are largely collected at the District level depending on the specific program being examined. The data embodies the professional judgment of people at different levels of the system. Educators are trusted to evaluate the quality of professional learning, make decisions accordingly and are then held accountable for those decisions. For example, district leaders and officials use their professional judgment to evaluate professional learning in schools and are then held accountable for its impact on instruction and student learning. They have the autonomy to make professional judgments on quality professional learning, but are always held accountable for these decisions.

Creating time

A common problem preventing the development of effective professional learning in many systems is a lack of time. Teachers simply do not have sufficient time in the day for taking up effective professional learning. Much has been made of how this experience contrasts with high-performing systems, with Shanghai providing the clearest example of a system that commits a large amount of resources to teacher professional learning.

The average teacher in Shanghai teaches for only 10-12 hours per week. Considerable time is allocated to professional learning. But Shanghai is an outlier even amongst high-performing systems. For example, in British Columbia only 1-2 periods per week are allocated to formal professional learning. But much more professional learning is done, within and between classes during the school week.

These policies can be brought together in numerous ways to fit local context and the stage of development of education systems. To illustrate, Figure 2 provides a snapshot of the main policies in Singapore that continually develop and reinforce effective professional learning in schools. It highlights the policies detailed in this report and the linkages between different policy areas. School leaders and professional learning leaders work together to meet school objectives that reflect system objectives. These objectives are at the heart of the appraisal of teachers and school leaders. All of this ensures there is space and time made for effective professional learning in schools. More importantly, this strategy ensures that a professional learning culture exists in schools, especially around the five key components highlighted in Figure 2 (next page).

Singapore invests significantly in teachers as professional learning leaders, both at and above the school level. New leadership roles recognize excellence in professional learning, helping teachers to lead professional learning within their own schools and to align teacher needs and broader school objectives.

A select cohort of expert teachers—known as Master teachers and Principal Master teachers—leads professional learning across the system. This group is ultimately responsible for researching, designing and leading professional learning in their respective subject areas, and linking it to broader system objectives for education.

A rigorous system of teacher appraisal holds teachers accountable for collaborating and improving practice. Differentiated job descriptions encourage the promotion of highly effective teachers, and make them responsible for other teachers' professional development.

Finally, Singapore sets a deliberate policy for ensuring teachers have adequate time for their own development in everyday practice. While this is an expensive policy, requiring concessions in other areas, it is nonetheless an effective one. Schools receive additional funds so that teachers

can collaborate throughout the working week. This strategy targets the continual development of learning communities as the primary platform for professional learning in Singapore's schools, with teachers heavily involved in setting the framework for how these operate. Learning communities are shaped by four critical development questions that reflect the improvement cycle:

1. What is it we expect students to learn?

2. How will we know when they have learned it?

3. How will we respond when they do not learn?

4. How will we respond when they already know it?

These questions guide data collection and evaluation, with a view to developing teaching practice to improve student outcomes.

This report provides strategic, policy and practical pathways to improve professional learning based on an analysis of high-performing systems. The background context is always what the research says has the greatest impact on teaching and learning in schools. In this sense, the report shows how these high-performing systems operationalize the evidence for sustained impact.

Figure 2 Professional Learning in Singapore

Strategic Directions: Setting Expectations for Professional Learning and Recognition

System Strategies and Policies

Developing Leaders

- System-level professional learning leaders (principal master and master teacher) lead in the research and design of professional learning in their subject areas
- Teacher professional learning leaders in schools (school staff developers) help identify needs and create school-wide learning plan
- School leaders work closely with teacher professional learning leaders, align their work to school planning, and help create conditions for collaborative learning

Evaluation and Accountability

- Feedback loops on effectiveness of external expertise
- Peer pressure in learning communities to continuously improve own practice
- Career tracks have senior and lead teachers play large roles in developing less experienced teachers
- School leaders implement school self-evaluation reviews once every 2 years, and are appraised on teacher development
- Teacher appraisal is a key mechanism for teacher growth. Teachers are evaluated on how they develop themselves and others in promotion

Creating Time

- Generous funds to schools to reduce teaching hours
- Deliberate policy to give teachers extra time to evaluate and develop practice during the week
- Extra time for collaboration during the week

Impact on Schools

- School improvement organized around effective professional learning
- Profesional learning built into daily practice
- Recognize the development of teacher expertise
- Teachers share responsibility for their own and others' professional learning
- District roles lead to professional learning throughout the system

Box 1 Effective Adult Learning

Adult learning should only be considered effective when it changes practices for the better. Therefore, professional learning is only effective when it improves teaching. How can this occur? There are many ways but it is fundamental that for teachers' learning to be effective it must include a range of activities connected to their classroom practice. Figure 4 (page 14) demonstrates the positive relationship between the percentage of people that change their practices and the range of activities in their learning. Most adults change their practices not simply from reading and observing others work, but from combining these passive activities with active collaboration and learning-by-doing.[4]

Effective adult learning is active, where learners work toward learning goals and drive their own process of improvement. Effective professional learning involves teachers collecting, evaluating and acting on feedback to modify their teaching practices. Intensive observation and analysis, or 'microteaching', is most effective.[5] In John Hattie's 2009 meta-analysis ranking the impact of different interventions, professional learning activities such as formative assessment (ranked 3rd) and feedback (ranked 10th) had a strong effect on student learning. An internationally renowned study by Timperley et al. (2007) found the greatest effects for professional learning occurred when it challenged teachers' thinking and conceptions about student learning and engaged them sufficiently to develop their knowledge and skills in ways that improved student outcomes. This generally took place over an extended time period and involved external expertise. Teachers will then be in a position to adapt their classroom behaviors to better meet student needs: this is, after all, the point of professional learning.

A more detailed overview of the evidence on effective professional learning is provided in Appendix 6.

Part I: Strategy and Policies

1. A Strategy for Improvement

High-performing systems set clear strategic directions for quality professional learning. British Columbia, Hong Kong, Shanghai, and Singapore alike send a clear message to schools: 1) student learning is what matters; 2) effective professional learning is the core lever for improving student learning; and 3) effective professional learning is central to school improvement and school evaluation.

Setting strategic directions for these systems does not, however, entail being 'tight' on the specific professional learning programs that schools implement, or on the total number of hours teachers spend on professional learning.

Rather, high-performing systems control and elevate the quality of professional learning across schools by helping schools to organize school improvement around the principles of effective professional learning and hold them accountable for doing so.

For many schools, this requires a cultural shift in attitudes towards the relationship between professional learning and teaching. Strategic reforms aim to build professional learning into daily practice and teachers' professional identity; to generate a culture in which teachers share responsibility for their own and others' professional learning; and to create structures for recognizing teaching expertise, including creating distinct positions for leading professional learning throughout the system (Figure 3).

Figure 3 identifies key reform areas that high-performing systems use to improve professional learning. These are: developing leaders of professional learning at both the school and district or system level; ensuring evaluation and accountability mechanisms recognize and reward effective professional learning; and creating time for teachers to pursue professional learning throughout the working week. The following three chapters analyze how high-performing systems have implemented these reforms in recent years.[6]

Setting strategic directions: 'tight' or 'loose'?

A recurrent policy debate, both within education and across other sectors, is whether the most effective systemic change comes from bottom-up or top-down reform. Policymakers and reformers argue over whether change should emanate from government and centrally led initiatives, or from shifts at the school level.

Figure 3 Professional Learning Strategy
Strategic Directions: Setting Expectations for Professional Learning and Recognition

System Strategies and Policies	Impact on Schools
Developing Leaders	School improvement organized around effective professional learning
Evaluation and Accountability	Profesional learning built into daily practice
	Recognize the development of teacher expertise
Creating Time	Teachers share responsibility for their own and others' professional learning
	District roles lead to professional learning throughout the system

This distinction, however, implies a simplistic dichotomy that does not adequately reflect the conditions of systemic change. In the literature on the issue, further confusion arises from the absence of internationally standardized definitions of these terms: what one country categorizes as bottom-up reforms is elsewhere deemed top-down.

Semantics aside, each of the high-performing systems considered in this report emphasizes the power of bottom-up initiatives. At the same time, however, within each system, the central administration or authority sets clear—and, on occasion, prescriptive—objectives and expectations for quality professional learning.

Rather than follow the logic of reductive comparisons between 'centralized' and 'decentralized' systems, therefore, policy debate is better served through analyzing the instances in which a government or central administration is 'tight' or 'loose' on professional learning reforms. 'Tight' in this context indicates when a government exerts firm control over particular regulations and requirements within a sector, with 'loose' describing a comparative absence of regulation.

A government or central authority may be 'tight,' for example, on regulations for teacher evaluation across the system, but comparatively 'loose' on teaching practices or curriculum at the school level.

This report shows that high-performing systems are 'tight' on teacher professional learning in comparison to other, less-effective systems, while being comparatively 'loose' on student performance targets.

In other words, high-performing systems tend to be prescriptive about what constitutes effective professional learning in schools. Rather than being 'tight' on the specific professional learning programs that schools offer (learning communities, mentoring, courses, and so forth), effective systems establish the expectation that quality professional learning will proceed within an improvement cycle, with student learning as the organizing principle.

The focus on student learning cannot be underemphasized. It ensures professional learning is always relevant to teachers and anchors school improvement in the quality of professional learning. In turn, it facilitates evaluation and accountability policies as it allows evaluation of professional learning against student learning and how this changes with improvements in teaching (due to professional learning). The focus on learning also heightens the importance of understanding students' learning as a key component of effective teaching.

British Columbia, for instance, sets clear expectations that professional learning should develop teachers' abilities to assess student learning and to develop teaching practices in collaboration with others.[7] In Singapore, school leaders are required to set objectives for teachers to develop their capacity to use student assessment in order to identify the next stage of student learning.

British Columbia and Singapore alike—whatever their divergences on the ground—emphasize professional learning as a requisite step in raising student performance. This is why both systems design professional learning around the principles of an improvement cycle—Singapore's four critical questions, for instance, or British Columbia's Spiral of Inquiry—to ensure the quality and integration of professional learning within schools. Schools can then use these principles to focus on whatever areas of schooling they consider most important.

When managed effectively, this balance between 'tight' and 'loose' reforms provides schools with the autonomy to develop professional learning in response to student needs, within a broader set of expectations about the quality of professional learning.

The Surrey School District in British Columbia has pursued a specific strategy for the last five years. The district is 'tight' on expectations for quality professional learning. The district sends a clear message to principals that professional

learning within their schools must operate within an improvement cycle—as a means of improving student outcomes—and must focus particularly on formative assessment. Principals are therefore prepared in advance to meet expectations at the evaluation of school improvement plans, which occurs every two years.

Through clear strategic direction, Surrey School District has reduced variations in the quality of professional learning across its schools, and has effectively facilitated alignment between district and school-level strategy.

While the benefits of strategic alignment across systems are well established, achieving alignment remains a challenge for many systems.[8] OECD data show, for instance, that school and teacher evaluation systems are regularly misaligned.[9]

Facilitating collaboration between teachers and school leaders was a key factor behind the Surrey School District success story and reinforces improved teaching practices.[10] When collaborative work is corroborated with clear strategic objectives, the pace of organizational change increases.

2. Developing Leaders of Professional Learning

Three aspects of leadership development have been critical to making professional learning effective in the high-performing systems considered in this report. These include

- Professional learning leaders at the school,

- System leaders of professional learning, and

- School principals developing school improvement plans around professional learning.

All three are components of, and deliver on, a strategy that places professional learning at the center of school improvement. Teachers who assume roles of professional learning leaders in schools have a greater impact on teaching and learning. Teachers are more likely to change their practices when they see colleagues they admire—not just official leaders—championing desired improvements.

Table 1 Professional Learning Leaders in Schools

	British Columbia Coordinators of Inquiry	Hong Kong Curriculum Leaders	Singapore School Staff Developers
Level	Senior teachers	Deputy principal equivalent level	Senior/head of department
Role	• Help lead inquiry approach and collaborative working groups • Support teachers in identifying student learning issues and setting inquiry research questions • Coordinate and organize teacher development • Demonstrate lessons	• Introduced as part of curriculum reforms • Help lead school-based curriculum planning and implementation • Support school head in assessment planning and coordination • Promote professional development culture • Lead in improving teaching and learning	• Introduced to help implement Growth Model 2006 • Help champion, plan, and facilitate professional learning • Key role in strategic planning - leading learning needs analysis in school, balancing teacher needs and school priorities for teacher development • Guide teachers on effective practices

Professional learning leaders help create the broader school climate for learning that can rarely be driven by a single leader.

Professional learning leaders drive professional learning from within the teacher cohort — from helping to connect teacher needs to school strategic planning, to designing professional learning approaches, to sometimes just being the 'go-to' person on teacher development.

Job titles and roles for specific professional learning leaders vary across systems. They are, for instance, school staff developers in Singapore, curriculum leaders and professional learning coordinators in Hong Kong, and coordinators of inquiry in the Delta and other School Districts in British Columbia.
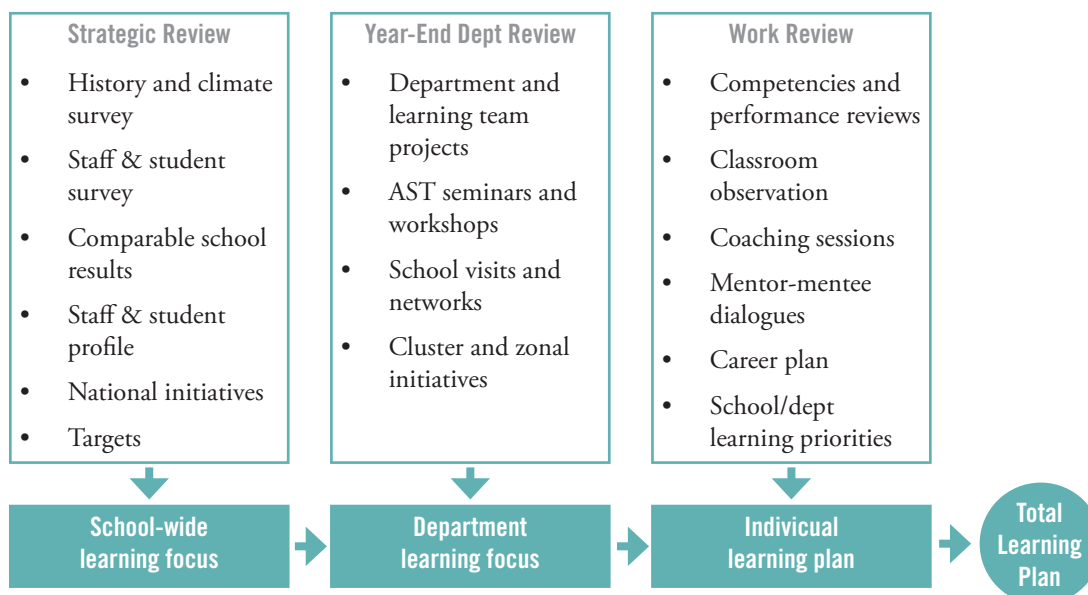
School staff developers (SSDs) are professional learning leaders in Singapore schools. Senior teachers are appointed to the role, where they champion, plan and help deliver professional learning within a school. They design and deliver professional learning initiatives, and lead induction and mentoring programs for new and novice teachers.

They also provide support for senior teachers and lead teachers who mentor less experienced teachers. Sometimes, they simply source the best external expertise to target an individual teacher need.

School leaders plan and set school learning directions and objectives in school development plans. The SSDs then create a 'Total Learning Plan' to achieve school objectives. The plan sets strategic objectives for teacher learning, the approach to achieve them, and the specific professional learning programs, activities and time required to deliver them.[11] The SSDs work with heads of departments to map teacher development needs from individual-, departmental- and school-level perspectives (Figure 4).

An individual learning plan is identified for every teacher. This is done through a 'Work Review' process that assesses teacher developmental needs. The SSDs and heads of department take into consideration each teacher's strengths and areas for improvement. They take into account performance reviews from the Enhanced Performance Management System, findings from lesson

Figure 4 Aligning Staff Development to School Improvement Goals in Singapore Schools

Strategic Review	Year-End Dept Review	Work Review
• History and climate survey • Staff & student survey • Comparable school results • Staff & student profile • National initiatives • Targets	• Department and learning team projects • AST seminars and workshops • School visits and networks • Cluster and zonal initiatives	• Competencies and performance reviews • Classroom observation • Coaching sessions • Mentor-mentee dialogues • Career plan • School/dept learning priorities
School-wide learning focus	**Department learning focus**	**Indivical learning plan**

Total Learning Plan

Sources: Interview with Academy of Singapore Teachers; interviews and documents provided by various Singapore schools

observation, reviews of student workbooks, course evaluations, mentoring dialogues, and teacher journals. They also consider new roles that teachers have been assigned, and their current and future career progression.

SSDs must complete a five-month induction program run by the Academy of Singapore Teachers.[12] Over 13 sessions, the program introduces the processes, systems and tools that are used to plan and lead teacher learning in schools.[13] These professional learning leaders learn how to set professional learning targets, evaluate professional learning, and develop coaching and mentoring skills as well as strategic and administrative planning skills.[14]

SSDs have their own network to provide peer support and a vehicle to share knowledge and resources. As there is only one SSD per school, these communities are highly valued as a mechanism for obtaining informal advice and sharing ideas.[15] Work assignments in the Academy of Singapore Teachers (and other industries) help SSDs develop a broader understanding of organizational learning and system and school alignment.[16]

System leaders of professional learning

An expert group of master teachers leads professional learning in both Singapore and Shanghai. They set objectives, develop programs and train experienced teachers who develop other teachers in schools.

Master teachers spend a lot of time in schools in order to research and understand teacher strengths and weaknesses, identify areas for development, and design professional learning curriculum.

Importantly, these system leaders are the pedagogical leaders in their subject area. For example, the principal master teacher in English language in Singapore is the pre-eminent English language teacher in the system. She sets the standard for pedagogical expertise and leads the network of English language teachers, designing the professional learning that all teachers receive.[17]

The emphasis on subject-specific professional learning then flows through the system. Learning communities, teachers' research, and mentoring are all structured around deepening subject-specific expertise.[18] Such expertise is then assessed and recognized through evaluation and accountability systems.

Table 2 Training and Support for Professional Learning Leaders Across Systems

	British Columbia Coordinators of Inquiry	Hong Kong Curriculum Leaders	Singapore School Staff Developers
Training	• Initially trained by district • Network meets every six weeks for planning	• 100 hours of training, often together with principal to ensure alignment	• Induction program • Work attachments • Industry placements • Networks
Time release (approx.)	10-20% reduced teaching load	50% reduced teaching load	30-40% reduced teaching load

School leadership: strategic planning to build a culture of learning and improvement

Professional learning leaders in schools ensure that professional learning plans reflect school objectives. In turn school leaders' strategic planning needs to reflect system-wide reforms to improve professional learning.

Professional learning cannot be effective in bringing about a learning culture in schools if it is not aligned and firmly embedded in school strategic planning.

In British Columbia the strategic focus of the system has shifted to inquiry-based learning communities that are the core of professional learning. School plans are now increasingly developed around inquiry-based learning.[19]

In making this change, school strategy focuses on an inquiry question, for example, "Will the use of a collaborative problem solving approach in Number Sense and Operations…improve achievement as measured by BC Numeracy Standards?"

Here, the goal is improving student achievement in math and the strategy is to use a collaborative problem-solving approach. School planning based on inquiry encourages schools to set specific goals and mechanisms to achieve them.

Over time, schools have focused less on quantitative goals and more on how to achieve them.[20] Professional learning is viewed as the engine that drives improvements in student performance.

Toolkit for Chapter 2

More details on the roles of leaders in these systems (see Appendix 15)

Example job descriptions of teacher leader roles

Sample annual school plans

School staff developer induction program outline

(Available at www.ncee.org/BeyondPD/)

Table 3 System Professional Learning Leaders

Shanghai Master Teachers & Subject Researcher Key Responsibilities	Singapore Principal Master & Master Teacher Key Responsibilities
• Oversee teacher development in subject area • Identify teacher development needs across the system, through research and school visits • Set directions and priorities for teacher learning in subject area • Design teacher professional learning curriculum, courses and modules • Mentor and build capacity of subject leaders and their ability to mentor others in schools	• Develop teachers and lead professional development at the zonal and national level • Pedagogical experts - the leading practitioners of their subject discipline • Share deep understanding of their subject disciplines, and drive innovation and improvement in pedagogy • Principal master teachers help develop master teachers; master teachers mentor lead teachers and senior teachers • Resource for all schools to drive pedagogical excellence through innovation and research • Partner with schools to implement pedagogical initiatives and improve teaching practices

Box 2 Leading Change in British Columbia

At an elementary school in B.C., teachers are enthusiastic about what they do in their inquiry working groups. They talk constantly about the topics they are exploring in the corridors, between classes and after school. They derive energy from evaluating what they do and getting better at it.

The school did not always have a positive culture. Not long ago there were many isolated, factional feelings among teachers. When the current principal started, she had to maneuver around these issues to get collaboration off the ground. First, she clearly communicated her vision for collaborative learning teams. She selected a topic she thought was most meaningful—formative assessment—and invited teachers to participate (but did not mandate it). Initially, she invited teachers to an overview of formative assessment during a lunch session. She placed books on formative assessment in teacher mailboxes, and began working with teachers who showed initial interest.

The principal then connected professional learning directly to teacher needs. She found common problems or questions among teachers and used those as a starting point for discussions on how formative assessment would help. She continuously role-modeled the assessment, development and evaluative practices of the improvement cycle and was an active learner alongside her teachers.

The principal spent a significant amount of time in teacher classrooms, often co-teaching or taking over a class so teachers had time to meet in their learning communities. She offered teachers opportunities to share their formative assessment work in district workshops. Teacher inquiry groups are now a key focus in the school, with teachers choosing their own specific topics and driving their own learning forward. They share learnings at staff meetings to spread best practice.

3. Evaluation and Accountability

Teachers regularly report that their professional learning is of variable quality, not suited to their development needs and not linked to their classroom teaching.[21] It raises the question of to what degree school, district and state leaders are held accountable for the effectiveness of teacher professional learning.

Evaluation and accountability mechanisms that ensure people throughout the system are held responsible for the quality of professional learning can in part redress these issues. These mechanisms range from quality-control measures for external courses and workshops to broader performance management programs.

A mentor teacher in Shanghai, for instance, is held accountable for how well he or she mentors a new teacher, the teaching practices of the new teacher, and the performance of the new teacher's students.

If these indicators are not improved, the mentor will miss out on promotion.

Similarly, a teacher in Singapore is promoted based on how well he or she engages in his or her own professional learning and how well he or she develops other teachers.[22]

Evaluation and accountability mechanisms ensure that effective professional learning is recognized and rewarded: only teachers who effectively develop both themselves and others will rise to leadership positions in the system.

Ensuring that quality professional learning is supported through evaluation and accountability mechanisms starts—in these high-performing systems—with system leaders setting strategic directions for quality professional learning. From this point, evaluation and accountability systems can measure how they are being implemented in both external (e.g., courses and workshops) and

internal professional learning programs (e.g., learning communities and mentoring programs).

Wider evaluation and accountability mechanisms—such as school accountability and teacher and school leader performance management—can then be structured to ensure people take responsibility for the quality of professional learning.

While there are variations across the systems analyzed in this report, broad evaluation and accountability policies continuously reinforce effective professional learning through a focus on

- student performance,

- the quality of instruction, and

- the quality of professional learning.

These systems hold schools accountable for professional learning. While the ultimate measure of the effectiveness of professional learning is its impact on students, the first measure of effectiveness is how much it improves instruction in classrooms.[23]

The focus on the quality of instruction, and improvements in instruction over time, links professional learning to teaching as well as student learning. It ensures that instruction within a school is evaluated with areas of improvement identified.

These policies operate across different levels of the system so district and government officials are held accountable for the quality of professional learning across the system. The details of these mechanisms are discussed below, but first two important and connected issues are addressed.

False dichotomy between development and accountability

The arguments for the positive impact of accountability on teacher professional learning runs counter to many of the debates about accountability policies, such as No Child Left Behind in the United States. In essence, one side of the debate focuses on the use of accountability

incentives (with an emphasis on school and student performance measures) to bring about changes in schools. Opponents on the other side of the debate claim that these policies distort effective education and instead argue for the focus to be on professional development. The debate treats these as alternative and mutually exclusive policy pathways.[24]

The evidence drawn from high-performing systems shows that this is a false dichotomy. They all have strong accountability policies that improve the quality of teacher professional learning and ensure that teaching is a collaborative profession rather than exclusively focusing on school and student performance measures.[25]

However, the focus of accountability in these systems is different. It is not weaker, nor does it shy away from difficult decisions. There are career consequences for teachers and school leaders who are not effective at improving the professional learning of other educators.

The quality of working relationships and professional learning processes are recognized (and therefore measured and included) as integral parts of individual teacher and school performance. But, it is equally recognized that professional learning and school improvement must focus on performance and outcome measures. Ultimately, the system and its policy settings are all about student learning. Professional learning is seen as only being effective if it increases student learning. A teacher or a school leader will therefore never be recognized as good at professional learning if they are ineffective at raising the performance of their students.

Incorporating professional learning into evaluation and accountability policies has important implications for the sorts of data collected (discussed below), particularly for the reliance on professional judgment.

Accountability systems that rely exclusively on school performance measures normally rely on student test score data. Incorporating a focus on professional learning requires a reliance on

perception data and professional judgment (e.g., inspectors and district officials making a judgment on the quality of professional learning in a school). This is a profound shift for many systems given the efforts to develop precise school performance measures over the past few years. It requires faith and trust in the people making professional judgments. Two elements illustrate how this can operate effectively.

The first is the extent and level of accountability that is applied at all levels of the system. For example, a state policymaker may feel concerned about the consequences of professional judgments made by a district or regional/cluster leader. This level of anxiety might be exacerbated if that district leader is not held accountable for those professional judgments. This engenders a low level of trust within the system.

In contrast, in Shanghai, evaluation and accountability regularly relies on the professional judgments of district leaders. The leaders are expected to know their schools, their strengths and weaknesses, and the quality of professional learning. The leaders are therefore expected to exercise their professional judgment on a regular basis and have been promoted to that position because they are good at doing so. The district leader is held accountable for both the performance of their

district and the quality of professional learning in the district. Among other things, their 360-degree performance evaluation stretches across different levels of the system. So, the system builds in a relationship of trust that supports accountability between levels of the system.
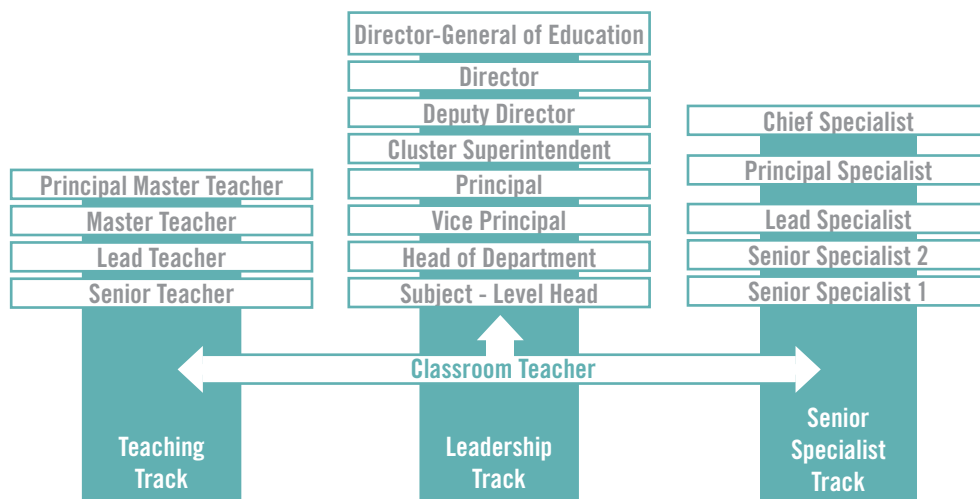
Second, professional judgments are not replacing student and school performance measures. They complement performance measures to emphasize both student learning outcomes and the key drivers of improved teaching and learning.

Overall, the system sends a clear message to schools: student learning is what matters most, effective professional learning is the best way to improve student learning, and evaluation and accountability will help embed the professional learning in schools and ensure its quality.

3.1 Evaluation and accountability of internal (within-school) professional learning

School accountability policies and broader performance management arrangements, such as teacher appraisal and career structures, emphasize quality professional learning in high-performing systems and increase the rate of improvement of teaching and learning in schools.

Figure 5 Career Tracks in Singapore

Teaching Track	Leadership Track	Senior Specialist Track
Principal Master Teacher	Director-General of Education	Chief Specialist
Master Teacher	Director	Principal Specialist
Lead Teacher	Deputy Director	Lead Specialist
Senior Teacher	Cluster Superintendent	Senior Specialist 2
	Principal	Senior Specialist 1
	Vice Principal	
	Head of Department	
	Subject - Level Head	

Classroom Teacher

Source: National Institute of Education, 2009

Career tracks

Clearly structured career tracks, supported by comprehensive performance management schemes, improve professional learning across schools. Singapore and Shanghai are the clearest examples of how career tracks and performance management programs can embed the improvement cycle in schools. They provide clear recognition, and therefore clear incentives, for teachers to improve the instruction and professional learning of other teachers. Overall, these systems have three objectives for professional learning

1. Designating specific positions where teachers are leaders of professional learning and responsible for developing other teachers,

2. Ensuring only effective professional learning leaders occupy these positions, and

3. Holding these leaders accountable for the professional learning they provide and giving them feedback on how to continually improve that professional learning.

The teaching pathway in Singapore

Career tracks in Singapore provide the most obvious example of how the above three objectives work. Teachers and school leaders are promoted along three different career tracks—teaching track, leadership track or senior specialist track—based on their performance appraisals (Figure 5).[26]

In particular, Singapore's teaching track provides a career pathway for teachers who wish to specialise in teaching their subject areas and develop less experienced teachers. Teachers on this track can be promoted without being shifted into an administrative role. This keeps the top-performing teachers doing what they do best—teaching—as well as giving them responsibility for developing others.

Senior teachers are expected to play a major role in the growth of other teachers. Within schools, senior teachers, heads of department, and subject level heads share responsibility for developing other teachers.

There is clear job differentiation between positions (Figure 6, next page). Principal master teachers and master teachers are responsible for developing other teachers through mentoring, model lessons, developing professional learning programs, and other ways of fostering good teaching practice.[28] Lead and senior teachers divide their time, to varying degrees, between classroom teaching and developing less senior teachers.

In Shanghai, the number of master teachers is capped. Every three years the Shanghai Municipal Education Committee evaluates a new wave of master teachers that they will send to specific districts. About 50 percent will not get through.[29]

Box 3 Career Tracks in Singapore

Teaching track: Teachers on the teaching track have a specific career trajectory that affords promotion without shifting them into an administrative role.

Senior specialist track: The senior specialist track is designed to develop a group of educators with expertise in specific areas of teaching. Educators who progress along this track are promoted to positions in the Ministry in one of three specialist clusters: curriculum and assessment, educational psychology and guidance, and educational research and measurement.

Leadership track: Teachers with demonstrable leadership qualities can be promoted to subject/level head, head of department, vice principal or principal, and to positions in the Ministry, right up to the Director-General of Education. School leaders often rotate between schools and the Ministry to prepare for promotion into these roles, highlighting the close relationship between schools and the Ministry. Master teachers coach senior teachers to develop their mentoring and development skills. External courses also target these skills.[27]

As it stands, there is approximately one master teacher for every 1000 teachers in Shanghai.

Master teachers are experts in their field and develop professional learning in their subject area. They are role models for other teachers and assist struggling teachers.[30] They must also publish articles on improving teaching practice.

Performance management

Career tracks are most effective when supported by comprehensive performance management programs. In Singapore, the Enhanced Performance Management System (EPMS) means teachers and school leaders are usually appraised by the person directly supervising them. In this way a teacher is usually appraised by a head of department, a vice principal by a principal, and a principal by a cluster superintendent.[31]

Professional learning is built into the system. A three-stage process ensures self-assessment, coaching and collaboration in schools even before any targeted professional learning is introduced.

1. Performance planning at the beginning of the school year requires teachers to evaluate their teaching and set goals for the year in teaching, instructional innovation and improvements, and professional learning.

2. Performance coaching from the supervisor throughout the year helps teachers achieve their goals. There is a formal interview mid-year to assess progress towards these goals.

3. A performance evaluation at the end of the year requires supervisors to conduct an interview and compare planned goals against actual performance. Professional learning opportunities targeted at areas for improvement are identified.

In Shanghai, promotion is based on 360-degree evaluations that assess student learning and quality of instruction (as determined via classroom observations), as well as a teacher's effectiveness in developing other teachers.[32]

Figure 6 Roles in Developing Others as Teachers Become More Senior, Shanghai

Role in developing others	• Mentor junior teachers • Observe and evaluate beginning teachers • Lead collaborative research and lesson groups • Help set group directions, research questions and methodology; guide group analysis and discussion	• Lead and guide teacher research groups • Mentor other teachers within reasearch groups • Develop research skills of other teachers, including giving seminars and workshops • Provide subject expertise in the school and support other schools • Lead content and pedagogy in the subject fields on top of their usual workloads	• Provide one-to-one and group mentoring to subject leaders and other teachers • Design and deliver professional learning curriculum in their subject area • Visit school to research learning needs, observe lessons, and give feedback • Take responsibility for improving teaching throughout the system in their subject area • Regularly visit school to develop "key teachers" (who are usually subject leaders at the district level)
Teacher track senior positions	**Senior (Advanced) Teacher**	**Subject Leader**	**Master Teacher (Subject Researcher)**
Required experiences	6-10 years of teaching experience	At least 11 years of teaching experience	At least 11 years of performing a senior education officer role

At all levels of Shanghai school education, the way that a teacher engages in professional learning matters. Their participation in collaborative lesson groups and the quality of their mentorship is a major consideration in their appraisal and promotion.[33] Different aspects of professional learning are included in teacher appraisal. These include

- Input measures of participation in professional learning, such as the number of hours undertaken (district officials inspect schools to check the hours and type of professional learning undertaken across the school),

- Performance in professional learning, especially collaborative learning groups (this is evaluated through observations of professional learning, peer feedback and 360-reviews),

- Professional learning outputs such as published papers, demonstration lessons, awards, and seminars and workshops, and

- Improvement in teaching evaluated by internal and external observations.

Middle level teachers are appraised annually at the school level with some district oversight. Teachers will also often conduct a self-evaluation as part of their teaching and research groups. Other group members give feedback on that evaluation. Evaluations are then handed over to the head of the department and then to the principal. Over time, this information becomes part of promotion discussions.[34]

More senior teachers must pass greater hurdles. Advanced teachers are nominated by schools and are then evaluated by the Advanced Teacher Title Committee. This Committee comprises 5 to 7 experts who observe teachers in their classrooms.

A master teacher candidate must have published extensively and received various teaching awards.[35] The Master Teacher Title Committee interviews candidates about their teaching practices and

observes their classes. The Committee also assesses the candidate's previous appraisals as well as their professional learning track record.[36]

School accountability

In Shanghai, school accountability operates at the district level and is complemented by a system-wide inspectorate and evaluation from the central municipality (Shanghai Municipal Education Commission).[37]

Schools are evaluated once every three years by a team of inspectors, mainly comprising retired school principals and teachers. They observe and evaluate the school leadership, the quality of instruction, student engagement and feedback from parents. More frequent monitoring, evaluation and feedback is done at the district level.

In Singapore, school self-evaluation is the main form of school accountability and requires that schools assess both what is happening in their school (student test results) and why (instructional quality and professional learning).[38] Self-evaluations center on the Singapore School Excellence Model (SEM) that guides the strategic planning of schools. The SEM includes a strong focus on staff professional learning, well-being and development.

In Hong Kong, school self-evaluations are complemented by external schools reviews that regularly set the improvement agenda for schools.[39] Self-evaluations require schools to analyze student learning and the quality of instruction. External evaluations regularly encourage schools to increase collaborative professional learning practices.

Evaluation and accountability across the system

While school leaders are held accountable for school performance, instruction and professional learning in their schools, so too are all government and district officials. This ensures responsibilities are shared and increases the perception of fairness of evaluation and accountability policies.

Box 4 Peer Accountability

This report addresses the benefits of collaboration in driving improvements in teaching and learning in schools. People interact and give each other feedback to encourage effective practices and discourage ineffective practices. This drives change in individuals and organizations as people respond to both internal incentives and peer pressure to use what their peers consider to be effective practices. In all of the high-performing systems, this process has driven change in schools. It has been greatly helped by a strategy that is 'tight' on effective practices.

While this report has used the term collaboration—given its broader meaning—instead of peer accountability, many of the essential ingredients are the same. All of these systems have high peer accountability that drives improvements in teaching and learning.

Teachers are driven to improve through 'soft pressure' from their peers and school leaders. For example, although in most districts in British Columbia there is no requirement for teachers to participate in inquiry groups, teachers are motivated to participate because they do not want to miss the opportunity to be part of school change, and because of the system-wide culture of high expectations and momentum to improve in British Columbia.

Networks across schools and professional learning communities within schools have established the norms and values that encourage teachers to improve and school leaders to prioritize teacher professional learning. One collective value is 'sharing,' in which inquiry groups must present their progress and results from changing practice to other teachers and schools. It is one of many examples of how these systems increase peer accountability to improve teaching and learning.

Source: Clement & Vanddenberghe, 2000; Joyce & Showers, 2002; Kolb, 1984; Steinert et al., 2006; Timperley, Wilson, Barrar, & Fung, 2007.

In Singapore and Shanghai, government officials are subject to the same framework of performance evaluations as teachers and school leaders.[40] In Shanghai, district leaders undergo a 360-degree evaluation as a part of their appraisal. In addition, the municipality assesses the finances and school planning of the districts and their professional learning programs. This includes an assessment of the amount of professional learning and its impact on teaching (with classroom observations used to gauge the quality of instruction). Ultimately, district and ministerial leaders are given the autonomy to make professional judgments on quality professional learning but, importantly, they are always held accountable for these decisions.

Under-performance

The consequences of poor professional learning are serious: any shortfall in this area adversely affects school performance. If a Shanghai school is not considered to be implementing effective professional learning practices, then two repercussions are possible.

The first is that the school's autonomy is reduced. Normally, about 50 percent of a teacher's professional learning is determined by the school: if evaluations show that the school's professional learning is not up to standard, this could be reduced to 10 percent. District-level officials and those charged with helping schools will take over professional learning until the school considerably improves.

The second repercussion is that teachers are denied credits for their professional learning. Shanghai school teachers need to accrue professional learning credits (roughly equivalent to the hours of professional learning they have undertaken) to qualify for promotion. However, if their school-level professional learning is not considered up to standard, credits are withheld. This increases the pressure on school leaders to provide quality professional learning.

To address these problems, schools are encouraged to work with other schools to improve their professional learning and share resources or seek further help from the district. On occasion, schools are included in the Shanghai Empowered Management Program that pairs high- and low-performing schools (see Box 5).

3.2 Collecting data

Any reforms to broaden evaluation and accountability require changes to the data collected. This is not a trivial matter. The choice of data collected sends a clear signal to schools about what is important and allows systems to reinforce effective professional learning through evaluation and accountability. The practical questions of what data to collect and how to collect it are therefore critical.

Evaluation and accountability data is collected in these systems through

- Student performance on standardized and school-based assessments,
- Interviews, focus groups and surveys of school leaders, teachers, students, parents and other stakeholders,
- Inspection and classroom observation data,
- Reviews of school documentation,
- Performance management data (e.g., teacher appraisal frameworks), and
- Informal professional judgments.

While systems collect this data in different ways, each level of the hierarchy is expected to have thorough knowledge of the schools for which they are responsible.

In Shanghai, district officials collect and analyze data in addition to what is collected for specific school accountability programs. The precise data that is collected varies across districts. The Empowered Management Program in Shanghai provides an

Figure 7 Hong Kong Key Performance Measures

Management & Organization	1. Stakeholders' perception of school management 2. Stakeholders' perception of professional leadership 3. Stakeholders' perception of teachers' professional development
Learning & Teaching	4. Number of active school days 5. Percentage of lesson time for key learning areas 6. Stakeholders' perception of curriculum and assessment 7. Stakeholders' perception of teaching 8. Stakeholders' perception of student learning
Student Support & School Ethos	9. Stakeholders' perception of support for student development 10. Stakeholders' perception of school climate 11. Destination of graduates 12. Stakeholders' perception of home-school cooperation
Student Performance	13. Students' attitudes to school 14. Pre-secondary 1 Hong Kong Attainment Test 15. Territory-wide system assessment 16. Public examination results 17. Academic value-add performance 18. Percentage of students participating in territory-wide inter-school competitions 19. Percentage of students participating in uniform groups / community serivce 20. Students' attendance rate 21. Percentage of students within the acceptable weight range

Source: Education Bureau, 2011b p. 3

Box 5 Evaluative Data Collected in the Shanghai Empowered Management Program

The Empowered Management Program is a fundamental school equity program in Shanghai. It illustrates the data collected to evaluate and hold actors accountable for school improvement, particularly professional learning.

The program contracts high-performing schools to turn around the performance of low-performing schools, usually within two years. Accountability relies on evaluation at the mid-point and at the end of the contract. Evaluation highlights the use of multiple sources of data, with an emphasis on the professional learning of teachers.

Putting any accountability program into practice highlights the fundamental importance of decisions about what data is collected. For this program, data is collected on student performance from standardized and school-based assessments, but the majority of data is collected from evaluators. To do this, evaluators, often with district officials, spend time in schools analyzing documentation (e.g., school plans, professional learning strategy); observing instruction; and conducting surveys, interviews and focus groups with school leaders, teachers, parents and students. Survey data are used to build indicators of teacher, student and parent satisfaction.

There is a strong focus on the steps common to turning around low-performing schools: school leadership and strategic planning, school culture and organization, effective teaching, student learning, and relationships with the community. A constant in the first four elements is the assessment of the effectiveness of collaborative professional learning programs in the school.

Evaluation of professional learning in the school examines how strategic planning to improve teaching and learning is being implemented. Staff development plans are assessed, professional learning teams observed, and many interviews all contribute to the evaluation of the effectiveness of collaborative professional learning groups. Teacher interviews focus on their instruction, professional learning and research.

Evaluation of instruction includes examining teaching plans, curriculum schedules, textbooks, and other teaching materials. Classroom observations are critical and are supplemented by surveys and interviews of teachers and students to better assess feedback between teachers and students.

Evaluation of student learning incorporates student performance on standardized and school-based assessments and various awards received by the school. It also focuses on the nature of student learning: effective student learning habits and behaviors are assessed through interviews and classroom observations.

The Empowered Management Program also illustrates how strong accountability is distributed across the school system. For example, district officials must identify the low- and high-performing schools to participate in the program and will be held accountable for matching the right schools. District leaders must know and understand the strengths and weaknesses of their schools – not only student outcome measures but what is happening on a day-to-day basis in each school in the district. District leaders are evaluated and held accountable for their decisions and, in turn, are rewarded for effective practices that improve school performance.

Source: Jensen & Farmer, 2013

excellent example of how data is collected and used across the school system.

In Hong Kong, school planning processes are guided by a framework of performance indicators established by the Education Bureau. These performance indicators include school performance targets (student achievement), instructional quality (teaching and learning processes), and leadership of staff development (see Figure 7, page 24).

In developing these indicators, teachers, through surveys, provide their opinion on the professional development offered within the school and their satisfaction with the school's leadership.[41]

An External School Review team evaluates previous school development plans, annual school plans and school reports. The team collects evidence through meetings with students, staff, the principal and parents. In addition, the team conducts classroom observations of approximately 70 percent of staff.[42]

3.3 Evaluation and accountability of external professional learning courses and workshops

All systems struggle with quality control partly because quality is hard to measure and partly because the professional learning market is hard to regulate. Schools usually make the final decision on which professional learning expertise, courses and workshops are the best fit for their own teachers, yet schools often don't have a lot of information on quality.

Feedback loops in Singapore and Hong Kong help the information flow between teachers, government and providers to facilitate quality improvements over time. The Singapore Ministry of Education issues professional learning providers with a checklist based on the attributes of effective learning programs to help ensure that professional development is properly planned. They then collect feedback against the attributes of effective learning programs.

Teachers rate the effectiveness of professional learning at three stages:

- Pre-course: what are the expected learning objectives and post-training performance targets?
- Post-course (immediate): were the learning objectives and targets achieved? How can the learning be applied to your work?
- Post-course (subsequent): how has the learning been applied to improve teachers' practice? If not, why not?

At all three stages, the supervisor of the teacher (not just the teacher) provides feedback.[43] For example, the supervisor provides comments on whether they observed changes in the teacher's knowledge, skills or attitudes.[44] In addition, in Singapore, master teachers and assistant directors of the Academy of Singapore Teachers conduct audits and observations of courses on behalf of the Ministry of Education.

Box 6 Singapore Teacher Survey of a PD Session: Sample Review Questions

1. Have you made use of the techniques and knowledge from your mentoring coursework?

2. How frequently do you make use of the techniques?

3. Overall, how satisfied are you with these techniques?

4. Have you encountered any difficulties that have hindered your ability to use the techniques and knowledge you have learned?

Source: Pre/Post Course Review form. See Toolkit.

Information on course quality is fed back to course providers, who are expected to review and make improvements to the content, delivery and modes of instruction. Moreover, feedback is monitored centrally to ensure that providers do respond and make the necessary changes to their training programs. If they do not make improvements in line with the feedback received, then actions are taken centrally to ensure the provider will not be hired again.

In Hong Kong, Education Bureau staff annually review the quality of external courses through teacher surveys, interviews and examinations of course content. Feedback is provided to contractors for improvement.[45]

Toolkit for Chapter 3

Examples of teacher evaluation including appraisal forms, evaluation materials and performance indicators for evaluations

Sample external school review and inspection materials

Sample school self-evaluations and parent, teacher and student surveys

Examples of quality control surveys and review forms

Forms relating to classroom observations

(Available at www.ncee.org/BeyondPD/)

Box 7 External Experts: Recent Reforms to Maximize Impact

Like all systems, even high-performing systems have struggled with how to use external experts in a way that is useful to teachers. Reforms have been enacted to address these issues and cover three broad areas:

- Improve the quality of experts available for consultation
- Introduce new experts for teachers to consult, including leveraging existing expertise in the school system
- Introduce quality control measures

There is no single reform that will address all quality concerns. These are on-going issues across all systems.

Providing a clear focus for professional learning in a system sets a clear direction for external experts to shape their professional learning programs. As more experts focus in the same areas, the greater the level of professional learning offered to schools in key areas. This can then be reinforced by providing funds for experts to work with schools on these topics, and by providing direct support on these areas.

In Hong Kong, the Learning to Learn curriculum reform emphasized collaborative lesson planning and peer observation.[46] External experts knew these priorities and which programs would receive funding. Hong Kong established a Quality Education Fund and University-School Support Programs that provide funds to schools and universities to work together.[47] Teams of experts work with teachers to assess student learning and develop subject-specific pedagogy in schools. The Hong Kong Education Bureau also provides professional learning directly to schools in priority areas. On-site support services help teachers and schools implement curriculum reforms including school-based curriculum development and language learning priorities. Teams of former principals, vice-principals and teachers help schools with key professional learning activities including collaborative lesson planning, peer lesson observation and lesson study and learning circles.

4. Creating Time for Professional Learning

A recurrent problem preventing effective professional learning is a lack of time.[48] While teachers in high-performing systems do not necessarily have greater amounts of specified professional learning time compared to other systems, these teachers do, however, have fewer teaching hours each week than teachers in other countries, and comparatively more time to spend on improving their own teaching and learning.[49] The exception to this, as seen below, is British Columbia.

This changes the nature of reform debates on teacher time and professional learning. In the past, attempts to get more time earmarked for professional learning have in fact failed to improve student outcomes.

In part, the reason for this failure is that professional learning is effective only when it becomes a normal part of daily work life in schools. Separating professional learning from daily teaching routines is counterproductive, and limits the benefits for teachers and students alike.

What is needed is more time for effective professional learning practices that are incorporated into daily school life. Singapore has allocated additional money to schools to create more time for teachers. But it is not ring-fenced around a specific activity that is separated from teaching and learning.

Table 4 compares the number of hours that teachers from the high-performing systems spend on teaching each week, relative to other countries and regions. 'Teaching hours' refer to the time spent actually teaching within the classroom, and does not include time spent on lesson preparation or marking.

At the top of the table, teachers in the United States have the highest weekly teaching loads, with 27 hours per week in the classroom; Shanghai teachers have the lowest, spending 10 to 12 hours per week teaching.

Two observations may be drawn from this table. First, with the exception of British Columbia, the high-performing systems in this report dominate the lower end of the table, with teachers spending between 10 to 17 hours in the classroom each week. Teachers are, comparative to their peers around the world, relatively free to pursue professional learning opportunities throughout the working week and not as an out-of-hours extra.

More interesting, perhaps, and certainly more relevant for the majority of countries where teachers spend considerably longer in the classroom, is the case of British Columbia. In British Columbia, teachers spend up to 23 hours per week—around ten hours more than the other high-performing peers—in the classroom and yet still participate in one of the top-performing professional learning systems in the world.

At approximately 23 hours per week, teaching time in British Columbia is well above the OECD average (18 hours): British Columbia has, however, significantly improved professional learning within schools.

Table 4 Teaching Hours Per Week

Country	Hours Teaching Per Week
U.S.	27 hours
British Columbia	22-23 hours*
Finland	21 hours
U.K. - England	20 hours
Australia	19 hours
Average TALIS	19 hours
Poland	19 hours
Korea	19 hours
Singapore	17 hours
Hong Kong	17 hours**
Shanghai	10-12 hours***

Source: OECD, 2014, lower secondary
  * B.C. statutory requirement
  ** Hong Kong Education Bureau (secondary)
*** Interview with SMEC 2011

In many schools in British Columbia, only one to two periods per week are allocated to formal professional learning. Yet, even with this small amount of extra time, professional learning is effectively conducted throughout the school week. There are two reasons for this: professional learning time is embedded in daily work life; and teachers have time throughout the school week to improve their teaching.

How important are time targets for professional learning?

While high-performing systems profitably set time targets when first establishing teacher professional learning, once the necessary cultural shift had occurred and quality professional learning had been thoroughly integrated within the system, time targets were of diminishing relevance.

The cultural shift within Singapore involved encouraging teachers to consider professional learning as a privilege to be sought after, rather than a requirement to be endured. Such respect could only be earned if the quality of professional learning did in practice merit this level of respect. As one teacher from a secondary school in Singapore observed:

> "Professional learning has come a long way in Singapore. At first, the introduction of the 100 hours for professional learning [each year] was thought to be a lot. Over time it became very easy. We plan at the beginning of each year how we will develop and use this time. We consider it a privilege—an entitlement—to have it."

The Advisory Committee on Teacher Education and Qualifications in Hong Kong similarly emphasized that its 150-hour target was a 'loose' guideline: what matters is quality, not quantity. As stated in official policy in 2006:

> "Such an indicative target is never meant to be any kind of rigid requirement, and it is important for both teachers and school administrators to understand that teachers' professionalism can only be enhanced through quality CPD, rather than mere numbers of CPD hours."

Being 'tight' on the number of hours is not in itself an effective strategy on making the most of professional learning. Rather, what will make the difference to student outcomes is the quality of professional learning, and the alignment of structures within and between schools to ensure that teachers have the time to make the most of professional learning opportunities.

Toolkit for Chapter 4

Sample grant application form for inquiry group funding

(Available at www.ncee.org/BeyondPD/)

Box 8 Making the Most of Limited Professional Learning Time in British Columbia

In British Columbia, schools achieve effective professional learning outcomes with only modest amounts of teacher time. The majority of teacher learning in inquiry-based groups, for instance, occurs within one to two periods per week.

To support this, districts provide small grants to schools, often less than CAD $3,000 per school.[50] Governmental financial support for professional learning was a strategic priority, with grants being issued throughout a period of significant cuts to other parts of the budget.

With only modest funding to support operations, collaborative inquiry has nonetheless thrived in schools in the Delta School District.

The process started with some teachers asking for time to collaborate. The district allowed schools to change schedules in order to help promote teacher learning. Some schools took advantage of the offer, shortening classes in order to increase teacher collaboration time. These schools also streamlined meetings, combined classes, and used alternative supervision arrangements to further free up teacher time. Teachers and leaders alike saw the value of professional learning, and developed the necessary strategy to facilitate it at the district level.

Now all schools have integrated collaborative time. The district added 30 minutes of additional time to the school day twice per month (16 times per year), and time was given back to teachers during a day of relief during exam period.

See a sample grant application form for inquiry group funding in this chapter's toolkit.

Part II: Professional Learning Programs

5. Learning Communities

Across high-performing systems, learning communities have emerged as a cornerstone program for effective professional learning.

These learning communities are not, however, simply platforms for exchange and coordination of teaching plans or materials.

Rather, when well organized, learning communities help to initiate a cultural shift towards creating expectations for improvement within schools and teachers. This involves broadening the conception of what it means to be a teacher (to include continuous and genuine professional development), and improving teacher practice through exposure to peers and mentors.

There is, however, no universally effective learning community model.

Table 5 below illustrates how British Columbia, Shanghai and Singapore organize their learning communities within the context of their specific systems.

Despite the divergences in the particular model— be it British Columbia's learning communities, Shanghai's research and lesson groups, or Singapore's professional learning teams—each system moves through the key stages of the improvement cycle

to ensure their professional learning communities meet the needs of teachers and students.

From the assessment stage of collecting evidence and data on student learning, to developing new practices to improve student outcomes, and finally to evaluating—through observation of lessons, for instance—the impact of the new practices, this cycle is the common element running through each system.

The pace of adoption of new learning communities varied across systems. For example, all schools in Singapore now use learning communities as the primary platform for teacher development. This began in 2009 following a Ministry of Education decision to officially introduce learning communities as a way for teachers to take greater ownership of their development. The pace at which learning communities were effectively adopted in schools varied across the system, but after a few years nearly all schools based their professional learning on learning communities.

Policy changes to the structure of professional learning have not resulted in immediate changes across any of the high-performing systems discussed in this report. It takes a number of years for significant change to be adopted in a meaningful way. Adoption will be uneven, especially given schools have ownership over much of the process.

Table 5 Learning Communities Across the Systems

	British Columbia Learning Communitites	Shanghai Research and Lesson Groups	Singapore Professional Learning Groups
Stage 1 Assess	1. Scanning (evidence of student learning) 2. Focusing (prioritizing)	1. Set research question based on student learning	1. Collect and analyze data 2. Discuss focus for improvement cycle
Stage 2 Develop	3. Developing a hunch 4. New professional learning	2. Review research evidence 3. Prioritize teaching strategies	3. Propose new approaches
Stage 3 Evaluate	5. Taking action 6. Checking (assessing impact)	4. Test strategies in class; observe and discuss each other's lessons 5. Analyze evidence, identify improvements, and publish results	4. Implement new approaches and measure impact 5. Review, reflect and present on what worked

But accountability over the type and quality of professional learning can help. For example, the adoption of new learning communities in British Columbia was quicker and more consistent in some districts that emphasised learning communities in the accountability practices.

5.1 Learning communities in Singapore: a case study

In Singapore, professional learning communities comprise the entire teacher learning community across the school: within this group, there are professional learning teams that are subject, level or interest specific. Schools have authority over collaborative teams at that level.

These professional learning teams select a key issue for student learning in the school, which is analyzed through four 'critical questions.' These are:

- What is it we expect students to learn?

- How will we know when they have learned?

- How will we respond when they do not learn?

- How will we respond when they already know it?

Teams then collect and analyze data to form an evidence base, from which they propose new approaches. These new approaches are trialed and assessed for impact. Teachers then present their

Figure 8 Professional Learning Community Approach at a Singapore Primary School

Professional Learning Communities: Staff learning and development subject-interest groups at a Singapore primary school

3 Big Ideas:
- Ensuring students learn
- Building a culture of collaboration
- Focusing on student outcomes

WHAT DO WE WANT OUR STUDENTS TO LEARN AND BE ABLE TO DO?

Strategy 1: Provide students with clear learning outcomes and targets

Strategy 2: Show examples of strong and weak work

HOW WILL WE KNOW THAT OUR STUDENTS HAVE LEARNED AND UNDERSTOOD?

Strategy 3: Teach students to set goals and self-validate their learning (e.g., use scoring guide/rubric)

Strategy 4: Give feedback for improvement

HOW DO WE RESPOND TO THEIR LEARNING?

Strategy 5: Design lessons to help students learn by effective classroom discussions, questioning and teaching

Strategy 6: Teach students skills for peer- and self-assessment to check for their understanding and learning

Strategy 7: Engage students to reflect on their learning progress

HOW DO WE RESPOND IF THEY HAVE NOT LEARNED / ALREADY KNOW IT?

Strategy 8: Work with students to close their learning gaps / enrichment

Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov
	Reflect		Plan		Act		Observe	Reflect		
Form teams	Dialogue	Confirm focus	Data collection and analysis	Literature review and proposal	Implement		During Process: • What works? • What does not? • Do students respond?	Group reflection	Review project	Presentation

findings before the community, with a view to scaling up successful practices

Teams explore specific topics for substantial periods of time, often up to a year. The bottom row of Figure 8 indicates the timeline that the professional learning team worked to at a primary school in Singapore, from forming teams in January (to the left of the scale), to presenting before the community in November.

The Vice-Principal of that primary school described the process as follows:

> "Individual teachers introduced changes in their own classes, collected evidence from class discussions and student work on what the students understood and have done. Teachers … would observe the lessons and discuss what had worked well and what are the areas for refinement."

Generally, there are four to eight teachers in a professional learning team. They are either subject, interest or level focused, and are guided by senior and lead teachers, heads of department and school leaders.

Usually, these teams meet weekly, as the Ministry has mandated that schools set aside one hour or more per week for professional learning teamwork.

For case studies and further detail on how professional learning communities operate in Singapore, see Appendix 7.

A number of networks across schools exist around specific subject, role and interest (illustrated in Figure 9).[51]

Subject-based network learning communities are a key learning platform for experienced teachers of the same subject discipline to develop and enhance their subject matter, pedagogy and assessment knowledge. These networks are led by the master teacher, officers from the Academy of Singapore Teachers, senior and lead teachers from schools, curriculum and training officials from the government, and academics.[52] They work together to develop subject-specific professional learning and ensure it is aligned to broader system objectives and reforms, such as curriculum reforms.

Role-based networked learning communities provide platforms for sharing best practices from teachers with similar roles (for example, lead teachers or master teachers).
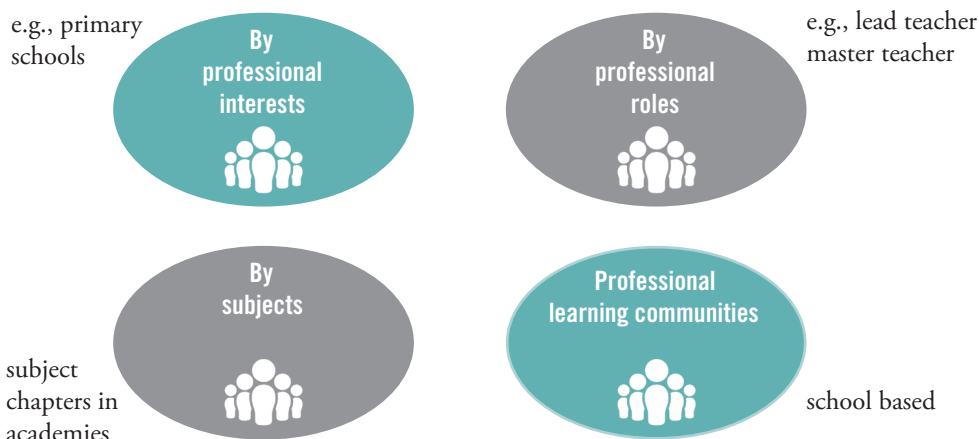
Other networks collaborate on professional interests, such as differentiated instruction.

Helping Singapore schools develop learning communities and networks

The Academy of Singapore Teachers was established in 2009 to facilitate the greater emphasis on learning communities.[53]

The Academy offers a range of support to schools to help them develop learning communities. This includes induction workshops for key staff, as well

Figure 9 Various Networks Encourage Collaboration Across Schools in Singapore

e.g., primary schools — By professional interests

e.g., lead teacher master teacher — By professional roles

subject chapters in academies — By subjects

Professional learning communities — school based

as consultancy support. Leaders of professional learning are trained to lead and champion the learning communities approach.

Schools are provided with a toolkit, which details several functions for school leaders including: developing and communicating a shared vision on collaborative learning; handling resistance; balancing creativity and autonomy within parameters; role-modelling commitment; providing training, resources, tools and templates; and mentoring.[54]

The Academy of Singapore Teachers also maintains a professional learning community intranet, promoting suitable templates and training videos that cover essential skills to run an effective professional learning team.[55]

For more information on how Singapore implements learning communities and supports schools, including training for teachers in developing research skills see Appendix 7. See this chapter's toolkit for sample guidelines for learning communities.

5.2 Establishing collaborative lesson planning in Hong Kong

Many education systems require a significant cultural shift for teachers to begin collaboratively evaluating student learning and developing their teaching. While the shift itself is large, it can be achieved through incremental reform.

Hong Kong, for instance, has gradually shifted practice by introducing collaborative lesson planning as part of broader curriculum reforms.[56] The Education Bureau offered experts to schools to help use collaborative lesson planning as part of school-based curriculum development.

The process was gradual and incremental: experts began by working with teachers in lesson planning meetings. Once staff gained the trust of teachers, they introduced the idea of lesson observation (for a guide on lesson observation, see Appendix 14).

For more details on the developmental process in collaborative lesson planning, see Appendix 10. For links to materials on collaborative lesson planning from the Hong Kong Education Bureau, see this chapter's toolkit.

5.3 British Columbia: Spiral of Inquiry

The rise of collaborative learning communities in British Columbia has been slow but steady since 2000. The communities are now the main avenue for professional learning in many districts across the province.[57]

Teachers work in inquiry-based teams throughout the year, generally comprising three to seven teachers from the same subject or grade level. Inquiry groups follow the Spiral of Inquiry model to collect evidence on student learning, pinpoint a specific improvement area, and research and implement a new teaching practice. During this process, teachers constantly collect data on student learning to gauge where instructional changes are working and where they are not. Teachers give each other feedback through lesson observation or co-teaching while implementing new practices.

Most inquiry projects research one area for most or all of the school year, so that adequate time is allowed for deep learning that changes teaching practice on a sustained basis.

An example inquiry question from a British Columbia elementary school shows a focus on improving student performance in math: "To what extent will the use of a systemic intervention program in early numeracy and the embedding of [assessment for learning] practices improve achievement for students struggling in math?" [58]

Topics for inquiry are formalized in annual school plans that set directions for collaborative inquiry groups. Once completed, teachers are expected to share the results of their inquiry work across the school and district.

See more sample inquiry questions in Appendix 8.

Working through the inquiry process

The Spiral of Inquiry process includes a number of questions that inform an evidence-seeking mindset among educators. These questions are: what is going on for our learners?; how do we know?; and why does this matter?[59]

The first two questions ensure the groups' activities are connected to assessment of student learning, while the third ensures that the work is aligned to the original goal of the inquiry. At the end of the process, team members consider the question, what is next?, in order to identify key areas for moving the project forward.

There is a clear focus on assessing student learning using classroom evidence. Principals or teacher leaders hold formal professional learning sessions introducing formative assessment for the teacher inquiry groups. School leaders ensure accountability and the transfer of knowledge across schools.[60]

The Spiral of Inquiry involves six action-oriented stages. These are:

Scanning: collect evidence about what is going on for learners. (Stage 1: Assess)

Focusing: from the evidence, decide on the highest priority. (Stage 1: Assess)

Developing a hunch: critically appraise how teaching is contributing to the issue. (Stage 2: Develop)

New professional learning: decide what the team needs to learn, and plan how to do it. (Stage 2: Develop)

Taking action: take multiple attempts to apply learning and try changes to practice. (Stage 3: Evaluate)

Checking: analyze evidence of student learning progress. (Stage 3: Evaluate)

The collaborative inquiry approach in British Columbia began with the Ministry of Education providing a small amount of funding to two key educators—Linda Kaser and Judy Halbert—to inaugurate voluntary, cross-district inquiry networks in 2000. Schools from nine districts came to the first meetings and, by 2014, around 44 districts (out of 60) had been active members.[61] Teachers and school leader teams are given small grants to incentivize membership of the networks.

The success of the inquiry approach is largely due to the clear structure provided by the Spiral of Inquiry method. As founders Kaser and Halbert observed,

> "We have found that as much as the time that is made available, if there isn't a framework (i.e., the Spiral of Inquiry) for collaboration, that time will be wasted."[62]

The school teams that participated in the cross-district networks brought the same Spiral of Inquiry framework to within-school learning communities. Many districts also offer within-school teams small grants to develop learning communities emulating the model used in cross-district networks. Districts support learning communities by directing funds to hire external experts as consultants or train senior teachers to lead inquiry groups to move the work forward (see Chapter 7 on external expertise for more information).

Figure 10 Spiral of Inquiry, British Columbia
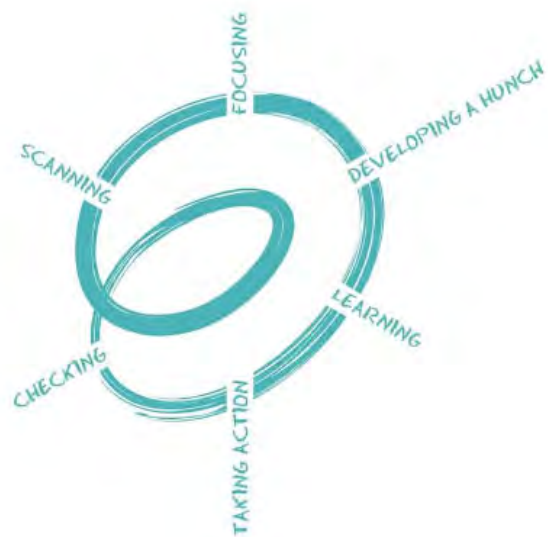
Source: Network of Inquiry and Innovation, n.d.

Districts understand that the deep learning they want teachers to achieve in their learning communities takes time, so most teacher groups focus on a single targeted topic for most or all of the school year. Teachers are not provided with a large amount of release time for group meetings (approximately 45 minutes every few weeks), but schools are allowed great flexibility in scheduling so, for example, classes can be combined to give teachers more time (see Chapter 4 for more information).

Making these changes can be difficult in schools where collaboration is low: while 70 percent of U.S. teachers reported that they spent time on collaborative work, only 17 percent reported significant cooperation among staff. School leaders often had to shape the learning communities in different ways to encourage initial participation. For example, in British Columbia, schools implementing inquiry-based learning communities often started with topics with which teachers were more comfortable, like social responsibility. It may have been tempting for system leaders to insist on more traditional academic topics (e.g., how to improve numeracy). But once teachers were comfortable with the inquiry process, schools were able to focus on other key learning areas, like math or literacy.[63]

More information about the history and operations of the cross-district inquiry networks is found in Appendix 8.

Guidance on what inquiry is (and is not)

Halbert and Kaser released a handbook detailing the Spiral of Inquiry steps in recognition that teachers' groups need more guidance. Some excerpts are highlighted below.

Developing a hunch: what is leading to this situation and how are we contributing to it?

The hunch stage gives teams an opportunity to share their perspectives on possible causes of the student learning issue. It is important that the teams focus on what is within their locus of control

(e.g., not on blaming parents). This stage requires a lot of trust in teams because teachers will be looking critically at their practice and sharing their observations.

What developing a hunch is:	What developing a hunch is not:
• Getting deeply held beliefs out on the table about our own practices • Our practices that we can do something about • Checking our assumptions for accuracy before moving ahead	• A general brainstorm of all possibilities • Obsessed with everyone else and issues over which we have limited influence • Venting about the past – or fuming about the present

Taking action: what will we do differently?

In this stage, teachers will work together to apply what they have learned. Taking action involves multiple attempts at changing practice, and it is important that teams support each other with observation, feedback, co-teaching, discussion and other collaborative structures.

It is recommended that teams keep momentum by setting a window of 2 to 4 weeks to take action, report back to the team, and then practice again. Teachers will need multiple opportunities to try new techniques before they are proficient, so the team is critical to providing support to encourage persistence.

What taking action is:	What taking action is not:
• Learning more deeply about new ways of doing things • Informed by a deep understanding of why new practices are more effective than others • About evaluating the impact on learners • About acknowledging feelings of vulnerability and building conditions of trust	• Just about implementing some new strategies • Trying out innovative ideas just because they look exciting • Doing something different and failing to monitor the effects on learners • Assuming everyone feels OK about the change

Box 9 Opening Up the Classroom Door: Lesson Observation

One of the advantages of learning communities is the platform they provide for teachers to collaborate and share their experience from the classroom. Such collaboration can occur on a less formal basis, to integrate this exchange of practices within an everyday context.

To this end, schools operating in high-performing systems cultivate an open-door culture.[64] Teachers need time to observe others to develop the deep knowledge and expertise required of a teaching professional.

Lesson observation helps break down the expectation that teaching is something simply done 'in your own classroom.' Being observed by peers, superiors, or in 'walk-through' days for school leaders helps build a culture of collaborative practice. A number of systems have overcome teachers' reluctance to opening up their doors - showing others it can be done.

Lesson observation is used for a variety of purposes ranging from purely developmental (peer lesson observation and feedback) through to teacher appraisal. It is a specific element of structured programs such as in initial teacher education, induction and mentoring programs, professional learning communities or external coaching. Figure 11 (on the next page) illustrates the various ways observation is used, both formally and informally.

A key distinguishing feature of effective lesson observation is that it focuses on the students, not just the teachers. Teachers often learn how to effectively conduct lesson observation through mentoring and learning from senior colleagues in the school. Workshops and seminars and other professional support services also help build these skills.[65]

Hong Kong provides an innovative example of a program that builds teachers' capacity in lesson observation. Experts from the Hong Kong Institute of Education work closely with schools on a 'learning study' program, adapted from a program in Japan. It involves intensive observations of one particular lesson (repeatedly), and how to improve it.

Figure 11 Lesson Observation in High-Performing Systems

Lesson Observation in Programs	Description	System Detail
Mentoring	• Beginning teacher induction • Experienced or master teachers mentor other teachers • Mentors and mentees observe each other's lessons	• Shanghai: beginning teachers undertake at least 16 observations per year • Singapore: beginning teachers have regular mentoring and observation with their mentors (duration varies; for example one school was 90 min of mentoring and observation per year)
Peer-lesson observation	• Informal peer-to-peer lesson observation for development	• Frequency across system varies, as does frequency between schools
Demonstration lessons	• Teachers give specific lessons for multiple teachers to observe – can occur both within own school and across districts	• Shanghai: master teachers deliver 3 per term at districtl level, expereinced teachers 1 per term at both school and disctict level, beginning teachers 1 per term. • Singapore: master teachers deliver demonstration lessons and profesional development, including peer lesson observation
Learning communities • Research groups (SH) • Professional Learning Communities (SI) • Collaborative lesson planning (HK) • Inquiry spiral (BC)	• Groups of teachers take turns to observe each other implementing specific lesson plans/pedagogy, provide feedback, refine lesson plan • Can be an informal method of feedback and support on impementation of pedagogy	• Shanghai: teachers undertake at least 6 observations per semester as part of research groups • In other systems, the frequency of observations is not mandated and varies between program, school and system
Teacher appraisal	• Superiors observe teachers' lessons for annual reivew/promotion application	• Singapore, Shanghai, Hong Kong: once per year
School external reviews	• Education department reviewers observe teachers' lessons; may provide immediate feedback	• Hong Kong: external school reviews once per five years

Sources: Academy of Singapore Teachers, 2014; Advisory Committee on Teacher Education and Qualifications, 2009; Education Bureau, 2011a; Jensen et al., 2012; Minhang District, Shanghai, n.d..

Toolkit for Chapter 5

Further information on the Spiral of Inquiry, additional school examples, and the history of learning communities in British Columbia (see Appendix 8)

Sample inquiry planning tool

Sample guidelines for learning communities

Sample elementary school learning plan

(Available at www.ncee.org/BeyondPD/)

6. Mentoring and Beginning Teacher Initiatives

Effective mentoring is more than just administrative or emotional support. Rather, as this chapter shows, high-performing systems use mentoring in their professional learning packages to enrich the teaching profession and improve student performance.

In these systems, mentors encourage teachers to measure the impact of their teaching practices on student learning. Through regular classroom observation and feedback, mentors help mentees to identify and address key areas for improvement. Mentors can also provide a source of content and pedagogical content knowledge, cultivating a safe environment for developing and evaluating new teaching practices.

Outside the classroom, mentoring can serve as a mechanism for collaboration between schools and districts or systems, and between new and experienced teachers.

The schools and systems considered here integrate mentoring into their operations in order both to recognize and to encourage excellent practice, and to further ensure that effective improvement practices are embedded in the very definition of what it means to be a teacher.

In Shanghai and Singapore, for instance, developing not just one's own but also others' teaching practices is part of what it means to be a teacher. Mentoring, that is, is part of the professional identity, for beginning and more experienced teachers alike. As one teacher from a high school in Shanghai remarked in 2011,

> "[Mentoring] requires every teacher to keep learning and exploring in teaching and research to reach higher innovative teaching methods."

Mentoring is a significant driver of professional learning in Singapore and Shanghai. Senior teachers are expected to be mentors to others. As teachers gain seniority, they also gain greater responsibility for mentoring less experienced teachers.

In Shanghai, every teacher has a mentor and beginning teachers regularly have two mentors. All teachers are expected to continuously develop and improve over the course of their careers, not just beginning teachers.

Table 6 juxtaposes the two systems' approaches to mentoring, highlighting how mentoring works both within and across schools.

Shanghai and Singapore both have a cascading model of teacher mentoring. An experienced and expert group of teachers ('master teachers') work across the system to develop teacher capacity in their subject field. Master teachers mentor the next level of senior teachers who, in turn, mentor and build the capacity of other teachers.[66] Teacher expertise is grown across schools as all teachers, regardless of seniority, are constantly learning from expert teachers.

Less than half of 1 percent of Shanghai teachers are promoted to the level of master teachers. They mentor a cohort of 'subject leaders' who work across many schools to build teacher capacity, especially in practical research. In turn, subject leaders mentor advanced and senior teachers in

Table 6 Mentoring in Singapore and Shanghai

Shanghai	Singapore
• Teachers have tiered mentoring responsibilities based on experience	• Mentoring is in teachers' job descriptions with training and often a lower teaching workload
• Mentoring includes diagnosing development needs and weekly lesson observation and critique	• Mentoring includes observation and developing collaborative research skills
• Accomplished mentors work across districs, not just within schools	• Developing others is a key criteria in annual performance appraisal

Source: Interview with Professor Wang, Institute Academy of Education Sciences, June 2014, Salleh & Tan, 2013, Interview with Ministry of Education, National Institute of Education and Academy of Singapore Teachers, August 2014.

schools to help build their capacity to mentor other teachers in their schools.

Figure 12 below illustrates how the mentoring system in Shanghai radiates from beginning and mid-level out through to the district level master teachers and subject researchers.

Similarly, in Singapore, the Academy of Singapore Teachers employs a select cohort of principal master teachers and master teachers. This cohort is responsible for developing professional learning in their subject area. They bring together senior and lead teachers and build their capabilities to drive professional learning in schools.[67]

In Singapore, schools structure time for teacher mentors to work with their mentees: many mentors are given a reduced teaching load so that they have time for this mentoring work. Mentors also have access to continual professional learning opportunities to enhance their mentoring knowledge and skills.[68] Their contribution

as mentors is considered during the annual performance appraisal.

For further details on mentoring for teachers and leaders in Singapore, see Appendix 11.
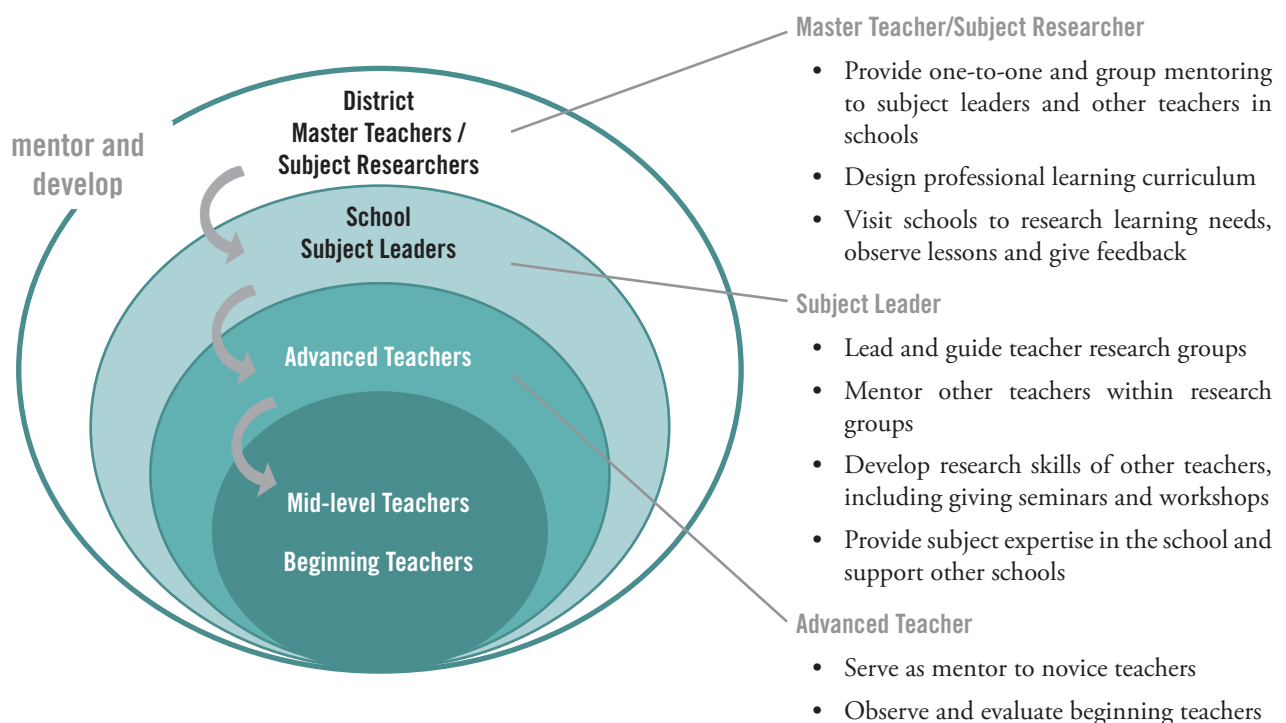
6.1 Shanghai: mentoring within schools

In Shanghai, the mentoring relationship begins with a discussion on developmental needs. The mentor undertakes classroom observation to assess their mentee's strengths and weaknesses. This diagnosis forms the basis of a three-year development plan.[69]

Mentees learn and develop through regular observation and feedback on their practice. Mentees watch lessons led by their mentors, who (ideally) model effective practices.

Mentors and mentees work closely together to develop techniques for improving lesson plans, managing classrooms, and effectively researching practical ways to improve student outcomes.

Figure 12 Mentoring Through the System in Shanghai

Master Teacher/Subject Researcher

- Provide one-to-one and group mentoring to subject leaders and other teachers in schools
- Design professional learning curriculum
- Visit schools to research learning needs, observe lessons and give feedback

Subject Leader

- Lead and guide teacher research groups
- Mentor other teachers within research groups
- Develop research skills of other teachers, including giving seminars and workshops
- Provide subject expertise in the school and support other schools

Advanced Teacher

- Serve as mentor to novice teachers
- Observe and evaluate beginning teachers

District Master Teachers / Subject Researchers

School Subject Leaders

Advanced Teachers

Mid-level Teachers

Beginning Teachers

mentor and develop

Box 10 Mentoring and Subject Specialization

Subject specialization is a valued aspect of teacher development. Shanghai and Singapore recognize the importance of subject-specific content and pedagogical knowledge, and build this into the mentoring relationship. Subject-specific skills are developed and reinforced in various ways through initial teacher education, professional learning programs such as mentoring and learning communities, and career ladders that value these skills.

Principal master teachers and master teachers are leaders and developers of professional learning in their subject.

Learning communities are often subject specific: in Shanghai, this is done through research groups; in Singapore, it is through subject-based networked learning communities; and in Hong Kong, through collaborative lesson planning.

Mentors and teachers are usually matched according to subject area to develop subject-specific expertise. Beyond their mentor, a classroom teacher has access to significant subject-specific assistance and guidance. As seen in Figure 13, a teacher can approach their school subject head or research group leader in the school for help.

In this way, a young math teacher on her first day in elementary school can see a direct line of subject-specific support and expertise through the system so she can build her teaching skills. This helps align professional learning to teachers' needs, and builds their expertise in a more targeted way. At some point, all teachers need help with aspects of teaching in their subject. General—as opposed to subject-specific—professional learning is unlikely to meet teachers' developmental needs.

Figure 13 Shanghai Roles in Developing Subject-Specific Pedagogical Knowledge
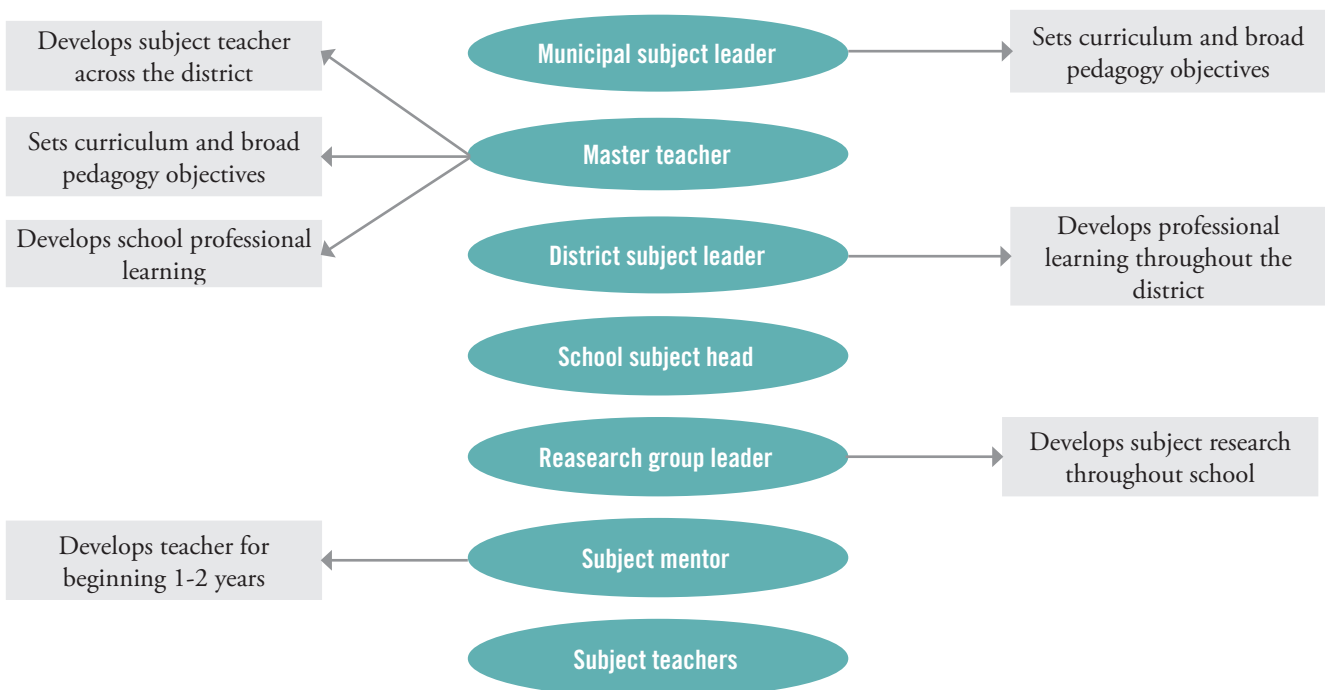
Mentors also provide guidance on collaborative group work and preparation for demonstration classes, which all teachers must give. Mentees write up reflections, taking ownership of their own learning progression.

Mentees evaluate the effectiveness of their mentors through 360-degree feedback. Mentors will not be promoted in Shanghai unless they get positive feedback from teachers they have mentored.

For a school example on mentoring in Singapore, see Appendix 11; for Shanghai, see this chapter's toolkit.

6.2 Beginning teachers

Beginning teachers require comprehensive support in the transition to the workplace. They require intensive role modelling, mentoring and other forms of training to learn what good practice on the job involves.

In Singapore, mentoring for beginning teachers is seen as critical. It forms a part of the continuum of teacher learning and growth, starting from pre-service and continuing throughout the teacher's career. In Shanghai, there is a strong focus on teacher content knowledge in initial teacher education, so the first years as a beginning teacher involve intensive, in-service pedagogical training.

Figure 14 Mentoring at a Shanghai High School

Activity	Requirements
Observe mentor classes:	Once a week
Complete a teaching reflection:	At least once a week
Deliver demonstration class:	Once a term at school and district level
Lead research project:	At least one project at district level or above
Publish papers in academic journals with relevant academic proofs:	Two - in municipal academic journal
Professional development case study:	At least 4,000 words
Summary personal teaching features:	At least 4,000 words
Teaching / research awards:	At least one at district level or above

Mentee: Teacher with more than 5 years experience
Mentor: District Subject Leader
Source: Jensen et al., 2012

Beginning teachers in Shanghai

Beginning teachers in Shanghai complete an intensive training program during their first year in order to become a fully certified teacher. Beginning teachers have two mentors: one for classroom management and one for subject-specific guidance.[70] Mentors may be experienced teachers within the 'home' school, or master teachers who work across the district.[71]

Figure 15 (next page) illustrates how the beginning teacher training in Shanghai operates.

Beginning teachers undertake intensive school-based training not only in their home school, but also at a high-performing school in their district (a new feature of the program since 2012).

At the home school, mentees engage in regular lesson observation with their mentor at least once every two weeks. They work with mentors in developing teaching plans and assessment design. Mentor teachers observe and evaluate beginning teachers' lessons at least three times per year. A significant portion of beginning teacher induction takes place through collaborative groups in the school. Beginning teachers are active participants in these groups and must lead discussions within the groups 1 to 2 times per semester with mentors and other teachers providing feedback.[72] The groups help develop the research skills essential for the improvement cycle.

Beginning teachers also visit a high-performing school in their district up to three times per week, where an experienced teacher mentors them. Teachers observe regular lessons as well as collaborative lessons and grade groups. The school provides training on how to conduct research and how to write a research paper.

In addition, district training consists of face-to-face seminars and workshops held one weekend per month, and network-based teaching that teachers conduct themselves.[73] This training develops foundational teaching skills and an awareness of how to use the improvement cycle to undertake research and lesson observation.[74]

At the end of the year-long program, beginning teachers must pass an evaluation to become fully certified. The evaluation includes a national written test (including teachers' law, pedagogy and psychology), an interview, and teaching a sample lesson.

Toolkit for Chapter 6

Sample guidelines for how to run mentor programs (e.g., how to hire and train mentors) and a sample mentoring agreement which includes mentor job descriptions from Shanghai

Sample materials for beginning teacher programs, including guidelines on how to run programs, program schedules, training manuals, and templates to document teacher learning

More information on how beginning teachers are trained in these systems (see Appendices 11-12)

A detailed description on how mentoring programs can operate (see Appendix 11)

Sample diagnosis form from Shanghai

*Available at www.ncee.org/BeyondPD/

Figure 15 Beginning Teacher Professional Learning in Shanghai

	Activities	Frequency
School-based training at 'home school'	**Training and support within own school** Mentoring • Devise training plan • Review and modify lesson plans • Observe each other's lessons Lesson Observation • Observe others and write report • Observe and comment on colleagues' classes • Be observed in official 'teaching trials' by home and base school mentor Lesson Groups • Design and moderate one activity • Deliver demonstration lesson (under mentor guidance) Personal reflection on professional experience as a probationary teacher Lesson planning - curriculum and assessment • Analyze one unit of teaching materials and lesson plan preparation • Design the homework of one unit and explain • Design and quality test unit tests • Conduct quality analysis of mid-term and final exams	 Once per year 4-8 per semester Once every 2 weeks (min) 10 times per year 3 times per year 3 times per year Once per year 2-4 times per year 10 essays per year 3 times per year 3 times per year 1 time per year 2 times per year
Training at a high-performing 'base school'	**New training component since 2012** • Beginning teachers attend a high-performing school • Assigned a mentor • Activities include shadowing a mentor, participating in research groups and lesson observation	Up to 3 half-days per week
District standardized training program	**Details of training program** • Workshops and seminars including lesson preparation, homework design, how to conduct lesson observation, curriculum design • Self-study	Once per month
Evaluation	**Evaluation details** • Evaluation by home and base school mentors • National written test • Interview	End-of-year assessment

Source: Minhang District, Shanghai, n.d., 2012; a Shanghai middle school, n.d.

7. External Expertise

The engagement of consultants and external experts is a feature of all education systems, high-performing or otherwise. External expertise covers a diverse range of institutions and services that some systems engage more thoroughly and effectively than others. This chapter outlines the particular models that high-performing systems use to make the most of expert services in their teacher professional learning.

The specific organizations and bodies that actors within the education system can approach vary depending on the context. Universities and research institutions, government departments and regulatory bodies, teachers' learning communities, and district or system-level organizations of master teachers are all examples of potential sites of external expertise that schools and districts can engage to improve learning outcomes.

Just as the sites of expertise are diverse, so too are the services that they offer for improving teaching and learning at the school and district or system level.

In the classroom, for instance, experts from learning communities and teacher organizations can help teachers of all levels develop pedagogy and content knowledge, as well as offer class observation, demonstrations, and mentoring.

Schools can engage experts from a range of sites to help refine and expand professional learning capacities for all teachers, and for support with, for instance, curriculum or assessment.

Universities and research institutions can similarly help introduce evidence-based practices, and design innovative programs to be piloted.

Figure 16 (below) surveys the various models that British Columbia, Hong Kong, Shanghai and

Figure 16 Models of External Expertise

British Columbia	Hong Kong	Shanghai	Singapore
• Consultants at district levels work with schools. They are usually subject-specific. • Consultants target specific teaching needs (e.g., pedagogy or content) as well as build capacity in professional learning (e.g., how to do inquiry or formative assessment.) • For example, the Burnaby district has 'program consultants', Surrey has 'helping teachers' and Campbell River has 'instructional support teachers'. • Universities and institutes provide support to schools as needed.	• Suite of Education Bureau School-based Support Services provides teaching consultants for in-school support. • University Support Partners Scheme funds experts to work in schools to advise and develop research-based pedagogy. • Quality Education Fund provides funds to schools to contract in expert assistance for professional learning and pilot innovative practices. • Hong Kong Teachers' Exchange - Chinese Mainland principals and master teachers work with Hong Kong teachers.	• Master teachers and subject leaders work across districts to mentor teachers, including: ◦ Frequent observation of teaching, ◦ Targeting specific teaching needs (e.g., pedagogy) as well as building capacity in professional learning (e.g., how to do research), and ◦ Giving demonstration lessons. • Universities and institutes provide support to teacher in schools on general and specific development needs.	• Master teachers provide specialist pedagogical expertise and coaching. • Academy of Singapore Teachers and other bodies provide professional learning support for schools and teachers: ◦ Directly helping schools, ◦ Providing consultancy and support, and ◦ Training teachers in critical inquiry skills. • National Institute of Education runs professional learning courses and degree programs. • Outstanding-Educator-in-Residence program involves inviting outstanding overseas teachers to conduct master classes in Singapore.

Singapore use in integrating external expertise and experts within their education systems.

British Columbia excels at engaging district-level subject experts within schools, leveraging their experiences to deepen teachers' content and pedagogical content knowledge and to provide instructional support for teaching staff.

The system in Hong Kong, on the other hand, is notable for the strength of four key bodies involved in educational quality services: the Education Bureau's School-based Support Services (SBSS); the University Support Partners scheme; the Quality Education Fund; and the Hong Kong Teachers' Exchange provide advanced technical, instructional and/or financial support for teachers and schools to pursue professional learning opportunities. Significant funds are available for academics to work with teachers and schools to develop research-based pedagogies and pilot innovative programs.

Subject leaders in Shanghai are external experts who work across many schools to help develop teachers' research skills. This professional category was introduced in 2004 to improve the quality of school-based research and to inject much-needed external help within schools looking to build teacher skills in specific areas. Subject leaders work with groups of teachers to guide them through research projects and to build their skills in designing, executing and reviewing practical research.[75]

Shanghai and Singapore both have formalized an expert cohort of experienced principal master teachers and subject researchers to raise standards across the education system. These teachers provide support to schools and teachers on specific pedagogy, observing and providing feedback, as well as strengthening teachers' research skills.

For more information on the major external support programs in Hong Kong and information on how British Columbia uses external expertise, see Appendix 13. For Hong Kong documents describing the School-based Support Services and program tools, see this chapter's toolkit.

Box 11 External Experts: Chinese Language Pedagogy in Hong Kong[76]

In 2001, Hong Kong ranked 17th out of 35 countries in the Program of International Reading Literacy (PIRLS) for 4th grade students. In just five years, Hong Kong improved to be ranked 2nd. This improvement was driven by changes in curriculum, assessment and pedagogy, including the curriculum 'key task' of reading to learn.

The Centre for Advancement of Chinese Language Education and Research at the University of Hong Kong worked with schools to develop Chinese Language reading pedagogy.

Research staff worked with teachers to implement the new pedagogy through an iterative process. Teachers initially assessed student learning, implemented the new pedagogy, assessed its impact and then made further pedagogy changes. Research staff and teachers developed school-based teaching materials and conducted collaborative lesson planning meetings, lesson observations and post conferencing meetings.

Some schools received two years' support from the university team, which included access to a university teacher, curriculum development officers and seconded teachers. The team worked collaboratively with schools to address particular pedagogical issues.

Research on the teaching method demonstrated that children taught using this approach for 25% of class time significantly outperformed students taught only using traditional approaches.

Courses and Workshops

There is another dimension to external expertise in quality professional learning not yet covered in this chapter: namely, off-site teacher training provided by externally administered programs and institutions.

The distinction between school-based and external professional learning services is not hard and fast: learning communities, for instance, tend to operate in the space between the two; while institutions, universities and ministries offering professional courses and certifications maintain strong linkages with schools (as seen in the British Columbia example below).

The key difference lies in teachers acquiring professional learning opportunities and certifications outside of the school context, in settings provided by governments, universities or research institutions.

In designing professional learning options, high-performing systems encourage teacher uptake of both in-school programs and external courses, workshops and further certifications in order to expose teachers to the fullest range of innovative and effective practices.

As with the external expertise structures discussed above, the types of external courses, workshops and certifications available depend heavily on the specific system context.

Vancouver Island University in British Columbia, for instance, offers a Certificate for Innovative Educational Leadership (CIEL), a one-year intensive graduate program that is designed around Kaser and Halbert's 'spiral of inquiry' model discussed earlier in this report. Over one hundred early, mid, and later-career educators have participated since it was inaugurated in 2011.

Throughout British Columbia, teachers attend workshops and professional development sessions related to inquiry and formative assessment. These workshops are usually organized by the principal of a school, by the district, or by other teachers. The

province also offers graduate school programs that focus on inquiry, which teachers may attend part-time while working.

The principal in a secondary school in the Burnaby School District of British Columbia, for instance, runs a Master's program for district teachers. This is a two or three year (depending on weighting) program designed to enable teachers to analyze in detail one or two areas of their professional practice.

In Singapore, the National Institute of Education, the Academy of Singapore Teachers, and the Ministry of Education are key sites for ongoing teacher professional learning, working in close contact with one another and with learning communities to offer integrated training opportunities for teachers.

The Ministry of Education launched, for instance, a targeted program for ensuring that at least one teacher in every school has expertise in researching and evaluating the impact of teaching on students. The program requires teachers to work in the Ministry for two days per week for a given period. The National Institute of Education then provides an eight-week training course (three hours per week) combined with action research in schools. Teachers then lead research in their school, developing the research skills of their colleagues in learning communities (see Appendix 7 for more details).

To increase the relevance of professional learning, the Academy of Singapore Teachers has designed and delivered courses run by teachers. Moreover, master teachers are increasingly involved in designing and delivering formal courses. Sessions are interactive, using workshop formats to provide teachers with opportunities to share their learnings with other teachers. The Principal of a Singapore primary school reflected on this shift towards a collaborative environment:

"I remember training in Singapore [10-15 years ago] used to be very formal, where the trainer comes in and you listen. Training is now more hands on, more participative. It's

a shift from trainer-centered to participant-centered. As it's more collaborative, I'm more invested, and I know I have to give my input otherwise the training may not be as effective.'

But all high-performing systems still grapple with how to ensure the quality and relevance of courses and workshops is sufficiently high. In short, there is no magic bullet to solve this problem. Efforts are made to ensure it is tied into within-school professional learning that always requires professional learning to start and end with student learning in the school. It is hoped this increases the relevance of professional learning but there are few reforms that will always ensure quality courses and workshops for teachers. However, some quality-control mechanisms have been implemented in recent years and are discussed in section 3.3.

Toolkit for Chapter 7

Examples of research courses for teachers, teacher-led workshops, and seminar content

Examples of school-based curriculum development

Description of the range of support offered to schools in Hong Kong

A more detailed look at how external expertise is used in British Columbia and Hong Kong (see Appendix 13)

*Available at www.ncee.org/BeyondPD/

Endnotes

1. When the report describes elements of 'high-performing systems,' it is referring to the four systems analyzed: British Columbia, Hong Kong, Singapore, and Shanghai.

2. Bill and Melinda Gates Foundation, 2014

3. OECD, 2014

4. Adults need to come back to new ideas continuously, often over months or years to fully develop new mindsets based on this cycle of learning: see Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Kolb, 1984; Wei, Darling-Hammond, & Adamson, 2010. This cycle of learning is consistent with Knowles' five assumptions of adult learning theory: that adults are self-directed learners, they bring a wealth of prior experience to education, they are ready to learn, are problem-centered in their learning and are best motivated by internal factors.

5. Mictroteaching involves novice teachers conducting mini-lessons to small groups of students, often in a laboratory setting, and then engaging in discussions about the lesson. Lessons are usually videotaped for later analysis, and allow an intense 'under-the-microscope' view of their teaching. These experiences have a strong and lasting effect on teacher behavior.

6. Sutton, 2010

7. There are, of course, variatons across districts.

8. See for example Barber & Mourshed, 2007; Fullan, 2006, 2010; Mourshed, Chijioke, & Barber, 2010

9. OECD, 2014

10. Steinert et al., 2006; Clement & Vanddenberghe, 2000; Steinert et al., 2006

11. Senior teachers and lead teachers play a key role in implementing the total learning plan.

12. The Academy of Singapore Teachers develops professional learning programs in Singapore to build professional excellence.

13. Sessions will be reduced to 10 from 2015.

14. For further detail, see this chapter's toolkit for a school staff developer induction program outline.

15. Work attachments are also available in various industries and the AST. This helps SSDs link and align government policies, school strategic plans, and individual learning needs in the Total Learning Plan for their school.

16. It is not only SSDs who undertake work attachments; senior and lead teachers are entitled to them as well.

17. Subject-based networked learning communities are led by the master teacher. They also include officers from the AST, senior and lead teachers from schools, curriculum and training officials from the government, and academics from the National Institute of Education (that provides all the initial training for all teachers in Singapore).

18. In Shanghai, the system leaders work at district-level academies and have no teaching load. In Singapore, they work at the Academy of Singapore Teachers and other associated bodies.

19. Inquiry approaches are not seen everywhere in school planning in British Columbia. Approximately 30% of schools have fully integrated the Spiral of Inquiry into planning and professional learning, but 83% of districts had some focus on inquiry at one or more schools in 2013-2014.

There are broad requirements for schools to develop some sort of annual school plan, where goals are connected to student achievement. The district will often provide a template or a set of guidelines for the school plans which can be quite informal. All schools are asked to provide specific, narrow goals for student achievement (which may or may not be attached to specific targets).

20. Interview with Surrey School District, October 2014

21. OECD, 2014

22. A teacher in Singapore is promoted based on the teacher's potential and performance - a whole-person assessment. Among many factors, engaging in professional development of self and of others will help them hone their classroom practices and be more effective teachers and teacher leaders.

23. Generally, there is no precise weighting of the focus on results relative to instruction and professional learning. A school's results still make up the largest component of their evaluation but there is no blanket rule that sets the percentage of each school's evaluation determined by each of the three components.

24. Green, 2014

25. In British Columbia, elements of their strategic reform create other forms of accountability. This is discussed in Chapter 5.

26. Lee & Tan, 2010

27. Lim, 2010

28. Lee & Tan, 2010

29. Interview with Dr. Zhang Minxuan, June 2014

30. Ferreras & Olson, 2010

31. The framework that the Enhanced Performance Management System uses to evaluate teachers is aligned to the key result areas and competencies specified by the Ministry of Education.

32. Strauss, 2014

33. A Shanghai high school

34. Interview with Dr. Zhang Minxuan, June 2014

35. Ferreras & Olson, 2010

36. See the Shanghai Municipality Education Commission, master teacher evaluation form in this chapter's toolkit.

37. This is often more informal as district leaders are required to have frequent interactions with their schools. Interaction is led by two Deputy Directors in each district; one responsible for instruction and the other for teachers' professional learning. The later often is situated in the Teacher's Academy in each district administration.

38. This has been a more recent reform that included the abolition of the school inspectorate. Self-evaluations are now supported by external support and less frequent external validation.

39. The External School Review process involves a team of Education Bureau staff – including former principals and teachers, and teachers on secondment from other schools – who spend four to five days in a school conducting a comprehensive review of its operations from strategic planning to teaching and learning. The inspections focus on four domains which are learning and teaching, management and organization, student performance, and student support and school ethos.

40. In Singapore, this applies to education officers working in the Ministry of Education (but not the Executive and Administrative Staff officers).

41. Teacher feedback questions on surveys include: "The teacher professional development activities organized by the school are of great help to me in performing my duties".

42. Education Bureau, 2011a, p. 5

43. In Singapore, survey feedback is entered onto an online course management system (TRAISI). This creates easy access by Ministry officials to oversight quality. Feedback data includes teacher service quality ratings and qualitative comments on the usefulness of programs.

44. Forms available in this chapter's toolkit

45. Interview with School-based Support Services, Education Bureau, Hong Kong, June 2014

46. Curriculum Development Council, 2002, Chapter 10, p. 8

47. Established in 1998 with an endowment of HKD $5 billion (or approximately USD $645 million in 2014 dollars) to finance projects that promote quality education in Hong Kong. Lessons from projects are shared broadly through networks, workshops and conferences.

48. OECD, 2014

49. International data on teachers' teaching and working time is imperfect, but most studies show that U.S. teachers have higher teaching loads than teachers from other countries. The difference varies substantially depending on how data is collected (See Abrams, 2015).

50. Networks of Inquiry and Innovation documentation, interviews with Surrey School District and West Vancouver School District representatives, September – October 2014

51. In Singapore, networks across schools are referred to as Networked Learning Communities (NLCs) and sometimes Communities of Practice (CoPs).

52. Academics are from the National Institute of Education that provides all the initial training for all teachers in Singapore.

53. The 'Academy of Singapore Teachers' is referred to in this document to include the range of subject-specific academies (English Language Institute of Singapore, Physical Education and Sports Teacher Academy and Singapore Teacher Academy of the Arts) as well as Language Centres (Malay Language Centre of Singapore, Singapore Centre for Chinese Language and Umar Pulavar Tamil Language Centre).

54. Hairon & Dimmock, 2012

55. Leadership development has also been integral to improving professional learning in Singapore. These reforms are discussed in Chapter 2.

56. Education Bureau, 2014

57. In British Columbia, districts are responsible for teacher professional learning. Hence, there are not common practices across the entire province.

58. Sample B.C. Elementary School Learning Plan, 2013. For a full copy of this sample learning plan, see this chapter's toolkit.

59. Kaser & Halbert, 2014 p. 212

60. Halbert & Kaser, 2013 p. 7

61. Halbert & Kaser, 2013 p. 8

62. Personal communication with Judy Halbert, December 8, 2014

63. Interview with the principal, Annieville Elementary School, October 2014

64. Hattie, 2009

65. For example, see Language Learning Support, Education Bureau, 2013

66. In Singapore this includes both senior and lead teachers.

67. Lead and senior teachers lead professional learning teams in schools and some facilitate networked learning communities across schools as well as mentor at school, cluster and national levels.

68. One example is the Instructional Mentoring Program that offers the mentors about ten days of blended learning (face-to-face workshops and online forums) in the first year and four days of advanced mentoring program in the second year.

69. A sample diagnosis form from Shanghai is available in this chapter's toolkit.

70. Zhang, Xu, & Sun, 2014, p. 155

71. Zhang et al., 2014, p. 155

72. A Shanghai middle school, n.d.

73. These can include a reading club, teaching forums and online tutoring: Minhang District, Shanghai, 2012.

74. See Appendix 12 and this chapter's toolkit for an example district annual training calendar.

75. Source: Interviews with: Ming Hang District leader June 2014; Mr. Ni Minjing, Director K-12 Education, Shanghai Municipal Education Commission, June 2014

76. Source: Cheung, Tse, Lam, & Loh, 2009; Mullis, Martin, Kennedy, & Foy, 2007; Tse & Loh, 2007, Jensen, Hunter, Sonnemann, & Burns, 2012

77. Jensen et al., 2012

Appendices*

Appendix 1   List of interviewed participants

Appendix 2   Background brief for British Columbia

Appendix 3   Background brief for Hong Kong

Appendix 4   Background brief for Shanghai

Appendix 5   Background brief for Singapore

Appendix 6   Summary of evidence on effective professional learning

Appendix 7   Professional learning communities in Singapore

Appendix 8   Learning communities in British Columbia

Appendix 9   Research and lesson planning groups in Shanghai

Appendix 10   Collaborative lesson planning in Hong Kong

Appendix 11   Mentoring and beginning teacher programs in Singapore

Appendix 12   Beginning teacher training in Shanghai

Appendix 13   External expertise

Appendix 14   Guide to lesson observation and demonstration case studies

Appendix 15   Leadership: job descriptions of professional learning leaders in schools

*Available at www.ncee.org/BeyondPD/

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The Center on International Education Benchmarking's Study of Teacher Quality Systems in Top-Performing Countries is a multi-part series and includes the following titles which are available online at www.ncee.org/publications:

Developing Shanghai's Teachers

Beyond PD: Teacher Professional Learning in High-Performing Systems

And a forthcoming series of reports from Linda Darling-Hammond of the Stanford Center for Opportunity Policy in Education (SCOPE).