

A Study in How Teachers Learn to Educate Whole Students and How Schools Build the Capacity to Support Them

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Schools, a remarkable invention to develop human potential, face the challenge of continuously evolving so that they prepare students with the competencies necessary to participate and contribute civically and economically in their societies and, increasingly, across national boundaries. As societies and economies change, so do the competencies required to participate. For this reason, leaders of schools and school systems periodically question the purpose of education.

School leaders need to ask such a question of purpose because the very survival of humanity depends on helping students gain the competencies necessary to care for themselves, to improve their communities, and to address shared local and global challenges. The velocity at which the world is changing places growing demands on what people need to know to participate meaningfully in their communities. Technological developments have brought with them great opportunities to improve human well-being, but also challenges. One challenge is that those who do not have the skills to understand and use these technologies and who lack the competencies necessary for participation in the twenty-first century will be further excluded; another challenge is that those technologies can be used for destabilizing and destructive purposes, for example, eliminating jobs, disrupting politics, or allowing individuals or groups to harm others.¹

The results are new opportunities, risks, and vulnerabilities, some significant, such as the social instability caused by exclusion and poverty, by the social and economic dislocations resulting from globalization, or by conflicts, environmental degradation, or terrorism. Whether we rise to address these challenges and whether we can advance more inclusive and sustainable progress are questions partly contingent on educational institutions' effectiveness in helping students learn how to act in ways that advance sustainability and well-being for all.

The Sustainable Development Goals, which the United Nations adopted at the Seventieth General Assembly in September 2015, are an aspirational and hopeful vision of a world in which humanity unites to create conditions that enable social progress, peace, and sustainability. The achievement of those goals is contingent on the capabilities and dispositions of most of humanity, as well as on the structures, systems, and processes that undergird the functioning of nation-states and organizations.

Schools *could* help all students develop the capabilities that will prepare them to successfully address these challenges. However, most schools don't do this effectively. To address these global challenges, students should develop an expanded range of cognitive as well as interpersonal and intrapersonal dispositions and competencies, including creative and critical thinking, collaboration, problem-solving and inquiry skills, competence to utilize versatile tools in learning and working, and ability to act in different contexts and to practice sustainable and responsible citizenship.

The Global Education Innovation Initiative (GEII) at the Harvard Graduate School of Education is a collaboration of institutions in several countries committed to supporting the necessary improvements in schools and school systems, particularly in public schools, so they help students develop the dispositions and competencies that will allow them to live good lives and contribute to sustainable development in their communities and the world.

In a previous research project, we synthesized existing knowledge on the competencies necessary for life and participation in the twenty-first century and used a taxonomy based on that synthesis to analyze the national curriculum frameworks of Chile, Colombia, India, Mexico, Singapore, and the United States.² We concluded that curricular aspirations had expanded in those countries. While cognitive purposes constituted the greatest focus of those aspirations, they included also the purposes to help students develop

the capabilities to collaborate with others and to manage themselves—what some call interpersonal and intrapersonal skills, or social and emotional development.

Another conclusion of *Teaching and Learning for the Twenty-First Century*, the book that resulted from our earlier research, was that teacher professional development was critical to helping translate these curricular aspirations into new opportunities for learning and teaching in classrooms and in schools. We hypothesized that more robust forms of teacher professional development to advance *whole-child education* or *holistic education* would benefit from an integrated theory of the development of these various competencies, from a theory that articulated the nexus of such development of competency and the instructional practices supporting such development, and of how teachers gained the competencies to lead those practices.

To advance knowledge about how to support teachers in gaining the competencies to lead holistic education, we embarked on a new research project, the results of which we present here. In this project, we studied programs that aimed to support teachers in delivering a more holistic education to their students, which transcended the traditional focus on academic achievement to include the development of character and the capacities to collaborate with others. We set out to study how these programs developed the capacities of teachers, school leaders, and other staff to assist students in gaining cognitive, interpersonal, and intrapersonal skills, to educate them holistically. Our goal was to identify how those programs conceptualized the kind of organizational and instructional practices that supported holistic education, how they supported teachers in developing the competencies to engage in such practices, and what organizational conditions in schools and in systems made the programs possible.

We focused this study on programs in Chile, China, Colombia, India, Mexico, Singapore, and the United States. We chose these countries because they have large populations of schoolchildren, because education is an important priority of government, and because in those countries, governments and civil society organizations engage in innovation to increase education's relevance. In addition, we were able to find research partners in each country who were interested in exploring the questions with us, and who had the necessary capacity and resources. In each country, we consulted education leaders to identify potential programs to include in the study. We looked for

programs that had a reputation for success, that had achieved a certain scale by reaching a number of schools, and that had been operating for a long time.

This approach and these criteria reflect an epistemological stance recognizing that we can best address important problems in educational practice by studying solutions already tested in practice and often developed by practitioners themselves. This stance drives our interest in finding existing innovative practices, which have already achieved some scale and success, to then study them to identify the underlying principles that account for success, so that further scale and impact are possible.

We see the global community of educational innovators as a rich laboratory for educational practices and design. Comparatively studying some of these innovative practices to understand their commonalities and differences recognizes in each an instantiation of fundamental principles. We can identify these fundamental principles for the benefit of the larger class of innovative practices and programs to which they belong, thereby advancing the reach and impact of efforts to educate students holistically.

In this chapter, we discuss why rethinking the goals and purposes of education requires that we rethink organizational practices as they pertain to professional development. We first review what we mean by twenty-first-century education and twenty-first-century competencies and skills for students. Then we turn to the topic of teacher development. We begin by reviewing what we know about teacher education and existing comparative evidence on the support teachers receive worldwide. We then examine this evidence in light of the aspirations to support students in gaining skills for the future, suggesting some key strands for how teacher professional development will have to evolve. We conclude by asking the questions that guide this study and foreshadowing our key findings.

SUPPORTING TEACHERS AND SCHOOLS FOR TWENTY-FIRST-CENTURY EDUCATION

Toward the end of the twentieth century, many education organizations and leaders reexamined the purposes of education for the new century. They were motivated, in part, by the transformations that technology was bringing to jobs and by the changing skill requirements for economic and social participation. They were motivated also by globalization; the rapid integration

of each society with other societies resulting from trade, telecommunication, travel, and migration; and the impact that globalization had in national economies, civic life, and politics. Technological change, innovation, and globalization accelerating at exponential speed and the conclusion of the millennium itself were other causes to pause and consider the goals that education systems should pursue.

Jacques Delors of UNESCO led one such reexamination in a multiyear initiative (1990–1996) of the International Commission on Education for the 21st Century. As a result of roundtables and consultations in all major regions of the world, Delors and a commission of fifteen people from various backgrounds and countries called attention to the development of competencies in four domains: learning to know, learning to do, learning to be, and learning to live together. Their report expanded on the developmental drivers that motivate such an expanded vision for education: globalization, the arrival of the knowledge society, social cohesion, the challenges of inclusion and exclusion, the imperative of gender equality, and the democratic need for participation.

In 1997, the Organisation for Economic Co-operation and Development launched an international program to assess student competencies. The conceptual foundation of that work was a global consultation of experts known as the Definition and Selection of Key Competencies, the DESECO project. The project defined key competencies as using tools interactively, interacting in heterogeneous groups, and acting autonomously. The capacity to use tools interactively comprises using language, symbols, and texts; using knowledge and information; and using technology, all interactively. Interacting in heterogeneous groups comprises relating well to others, cooperating, working in teams, and managing and resolving conflicts. The capacity to act autonomously requires forming and conducting life plans and personal projects, and defending and asserting rights, interests, limits, and needs.

In 2012, the National Research Council in the United States analyzed the capacities necessary for life and work and grouped them into three categories: cognitive skills, interpersonal skills, and intrapersonal skills.³

During the last two decades, others reported on the competencies necessary for meaningful participation in the twenty-first century, including an emerging interest in the development of socio-emotional competencies in schools and an interest in deep learning.

The World Economic Forum, for example, identified sixteen skills in

three broad categories: foundational literacies, competencies, and character qualities. Foundational literacies include literacy, numeracy, scientific literacy, information and communications technology literacy, financial literacy, and cultural and civic literacy. Competencies are the capacity to approach complex challenges, such as critical thinking, creativity, communication, and collaboration. Character qualities include traits such as persistence and adaptability, curiosity and initiative, leadership, and cultural awareness.⁴ A recent National Bureau of Economic Research study reports that, in the United States, there are growing returns to social skills, which have so far been unable to automate and therefore complement automation.⁵

According to educational change scholar Michael Fullan and his colleagues, deep learning “changes outcomes . . . the 6Cs of global competencies: character, citizenship, collaboration, communication, creativity, and critical thinking; and it changes learning by focusing on personally and collectively meaningful matters, and by delving into them in a way that alters forever the roles of students, teachers, families, and others.”⁶ A synthetic presentation of deep learning is what Dennis Shirley calls “achievement with integrity”; integrity refers to educating the whole person, igniting the intrinsic motivation of educators, and awakening the enthusiasm of students for learning.⁷

While there are differences in emphasis and in the number of competencies, these different authors and initiatives broadly agree that the competencies for the twenty-first century include knowledge, the capacity to use knowledge to solve problems, the capacity to collaborate with others, and self-knowledge and the capacity of self-management. Traditionally, the curriculum of public education systems has emphasized knowledge and the skills to use it to solve problems, with less emphasis on self-knowledge and social skills.

The expanded goals of education require rethinking of pedagogy and teaching, which in turn requires rethinking how to support teachers in gaining the competencies to help students master such a broad range of skills.

EXAMINING TEACHER PROFESSIONAL DEVELOPMENT FOR TWENTY-FIRST-CENTURY TEACHING AND LEARNING

Teacher Practice at the Core of Educational Opportunities

Teacher instructional practice provides the core of opportunity for student learning. Learning in schools essentially results from the actions students per-

form, following the design of sequences and pathways reflected in the curriculum, which their teachers lead or facilitate. An early model of opportunity to learn, which John B. Carroll developed in 1963, proposes that learning is fundamentally the result of interactions between students and teachers, which he termed “instructional quality.” The model has generated much empirical research, and hundreds of studies have confirmed the role of the factors and relationships in the model.⁸

Decades of research on teacher quality and school effectiveness underscore that teachers are one of the most important contributors to student learning.⁹ Three decades of school effectiveness and school improvement research confirm the importance of quality instructional practice and of teacher preparation and support to student learning. An often-quoted report states that “no education system can exceed the quality of their teachers.”¹⁰ In the words of two leading scholars of educational change, “The dynamos of educational change can and should be a system’s thousands of teachers and its school leaders.”¹¹ Increasingly, however, teacher quality is understood as the product of systemic supports to the practice of teaching and the profession and not merely as the result of individual attributes or skills of teachers.

Educators and policy makers alike now well understand the importance of quality teachers and teaching. The National Conference of State Legislatures in the United States, for example, drawing on a comparative study of high-performing education systems, has developed a seven-step protocol to build a world-class education system: build an inclusive team and set priorities, study and learn from top performers, create a shared statewide vision, benchmark policies, get started on one piece, work through “messiness,” and invest the time.¹² The report identifies four elements of a world-class education system:

Children come to school ready to learn, and extra support is given to struggling students so that all have the opportunity to achieve high standards . . .

A world-class teaching profession supports a world-class instructional system, where every student has access to highly effective teachers and is expected to succeed . . .

A highly effective, intellectually rigorous system of career and technical education is available to those preferring an applied education . . .

Individual reforms are connected and aligned as parts of a clearly planned and carefully designed comprehensive system.¹³

The National Conference of State Legislatures report, in underscoring the importance of teacher quality, provides the following levers to influence teacher quality: selective teacher recruitment, rigorous initial preparation of licensure, thorough induction, career ladders, a professional work environment, high-quality school leaders, high compensation, and high standards. The report does not examine *how* teachers can improve their skills to be able to teach to a more ambitious and broader conception of instructional goals, such as twenty-first-century competencies.

Similarly, the National Center on Education and the Economy in the United States has synthesized nine building blocks for world-class education systems, drawing on a comparative study of high-performing education systems.¹⁴ The building blocks also recognize the importance of teacher quality, including attention to in-service professional development and emphasis on incentives for continuous learning and school organization to support job-embedded learning. However, this framework also does not analyze in detail what forms of teacher professional development support capacities for twenty-first-century teaching and learning. The nine building blocks mentioned in the report are:

1. Provide strong support for children and their families before students arrive at school . . .
2. Provide more resources for at-risk students than for others . . .
3. Develop world-class, highly coherent instructional systems . . .
4. Create clear gateways for students through the system, set to global standards, with no dead ends . . .
5. Assure an abundant supply of highly qualified teachers . . .
6. Redesign schools to be places in which teachers will be treated as professionals, with incentives and support to continuously improve their professional practice and the performance of their students . . .
7. Create an effective system of career and technical education and training . . .
8. Create a leadership development system that develops leaders at all levels to manage such systems effectively . . .
9. Institute a governance system that has the authority and legitimacy to develop coherent, powerful policies and is capable of implementing them at scale.¹⁵

Teacher Education, Preparation, and Development

From this recognition of the importance of instructional quality and of the quality of teachers' work follows an interest in teacher education, preparation, and development. Recent scholarship on teacher education high-

lights the importance of systems to support teachers and, to some extent, challenges the notion of “teacher effectiveness” as an individual attribute, in favor of teaching as a practice situated in a social context. Linda Darling-Hammond and Peter Youngs, for instance, argue that the notion of “highly qualified teachers” reflects a school accountability paradigm whose intention is to compare school and teacher performance.¹⁶ Andy Hargreaves and Michael Fullan propose that education quality is the result of professional capital, which encompasses teachers’ individual characteristics (human capital), relationships (social capital), and professional norms (decisional capital).¹⁷ Other scholars challenge the notion of teacher effectiveness that equates instructional quality to students’ performance on curriculum-based assessments.¹⁸

Since most of the empirical research on the effectiveness of teacher education assesses it in terms of its contributions to a limited range of domains in student achievement, typically language, mathematics, and science, some propose an alternative view of teacher quality that focuses on whether teachers have the capacities required to teach, including curriculum planning, teaching and assessment, and ensuring quality.¹⁹ Still a third view of quality focuses on whether teachers practice according to professional standards.²⁰

Scholarship on the effectiveness of teacher education and development programs has typically begun by defining the intended outcome of such preparation. Most studies start by defining teacher expertise, including the necessary knowledge, skills, and dispositions. Lee Shulman, for instance, identifies five key domains along which teachers need to develop:

Behavior—effectiveness is evidenced by teacher behavior and student learning outcomes.

Cognition—teachers as intelligent, thoughtful, sentient beings, characterized by intentions, strategies, decisions, and reflections.

Content—the nature and adequacy of teacher knowledge of the substance of the curriculum being taught.

Character—the teachers serve as moral agents, deploying a moral-pedagogical craft.

Knowledge of, and sensitivity to, the cultural, social, and political contexts and the environments of their students.²¹

A synthesis of research on teacher professional development identifies the following skills, knowledge, and dispositions that teachers must have to be effective:

- General pedagogical knowledge
- Subject-matter knowledge
- Pedagogical content knowledge
- Knowledge of student context and their families
- Repertoire of metaphors to bridge theory and practice
- External evaluation of learning
- Clinical training
- Strategies to create and sustain learning environments
- Knowledge, skills, and dispositions to work with students of diverse backgrounds
- Knowledge and attitudes that support social justice
- Knowledge and skills to use technology²²

Teachers' development is a long-term process spanning their careers. Current research supports the notion that competencies are not fully developed in a single program of teacher education, but rather their development results from a series of structures and opportunities that constitute a continuum of development.²³ Initial teacher preparation, of high quality, is only the first step in a process of career development. This continuum includes how a teacher would be selected into the profession, incentives and respect afforded to the profession, initial preparation, career pathways, induction, and support all along their professional trajectory.²⁴

The conceptualization of this continuum underscores the importance of ongoing in-service professional development for teachers. However, evidence also questions the effectiveness of many existing professional development programs. For example, a recent study in three large public school districts and a midsize charter school network in the United States challenges that we know how to help teachers improve. The findings, presented with the provocative title "The Mirage: Confronting the Hard Truth about Our Quest for Teacher Development," show that despite school districts' massive investments in teacher improvement, most teachers do not significantly improve on a range of outcomes, from year to year, and that when they do improve, their growth cannot be attributed to any development strategy.²⁵ Another recent

synthesis of studies on teacher professional development concludes that “[t] here is currently too little robust evidence on the impact of different types of professional development for teachers.”²⁶

This, of course, does not mean that continuous professional development is irrelevant, only that we need more effective programs and fundamental rethinking about what kind of learning experiences lead to deep changes in teacher practice. Two reviews of the global research literature on teacher professional development concur that much of it is unrelated to the teachers’ needs or to the challenges they experience in their current practice in the short term, and often lacks alignment with school curriculum or with intended development trajectories.²⁷

A recent comparative study of teacher preparation and development in several high-performing countries characterizes teaching as the product of a system. Such a system results from mutually supportive policies in recruitment, teacher preparation, induction and mentoring, professional learning, teacher feedback and appraisal, and career and leadership development.²⁸ This study found a common goal in all countries to build a strong teaching profession.

A professional approach suggests that policy is directed towards the development of a teacher workforce that is highly educated and empowered to make decisions about teaching for the best interests of their students, based on knowledge accumulated from their training and from what they learn about the wisdom of practice from their in-service experiences and sharing of expertise with colleagues.²⁹

A recent review of the research literature on teacher professional development identifies ten features of effective professional learning, grouped into three domains: quality content, learning design and implementation, and support and scalability.³⁰ With respect to quality, effective programs are informed by evidence, focus on subject-specific and pedagogical content knowledge, focus on student outcomes, and offer a balance of teacher voice and system coherence. With respect to learning design and implementation, effective programs depend on active and variable learning, offer collaborative learning experiences, and provide opportunities for job-embedded learning. With respect to support and sustainability, effective programs are ongoing, have adequate resources, and have supportive and engaged leadership.³¹ The same report notes an evolution in approaches to teachers’ professional devel-

opment, from learning from external experts to learning from professional reflection on teachers' own work, and concurrently an evolution in understanding schools as learning environments instead of only workplaces.³²

Teacher Professional Development Today

Many opportunities for in-service professional development are currently available to most teachers. The Organisation for Economic Co-operation and Development (OECD) has conducted two cross-national studies, in 2008 and 2013. The Teaching and Learning International Survey (TALIS) examined teachers' descriptions of their working conditions and the professional support and development they receive.³³ The 2013 OECD report on the results of the TALIS survey, administered to representative samples of the teachers in lower secondary schools and leaders in mainstream schools in twenty-four nations that are members of the OECD and ten additional countries, describes teachers, their working conditions, and their opportunities for professional development. Some critics of the study argue that it has methodological limitations, particularly as a correlational study that does not allow establishment of causal inference; however, it remains one of the only cross-national surveys examining teacher and school leader practices in the world. The report describes the characteristics of teachers, their workplaces, the role of school principals, the kind of professional development activities that teachers participate in, the feedback teachers receive, how teachers spend their time, and what contributes to their job satisfaction. Four countries included in our current study—Chile, Mexico, Singapore, and the United States—also participated in the 2013 TALIS survey; in this chapter I will specifically mention data for those countries, as appropriate.

Given the velocity of social and technological change I described earlier, the demands on teachers will change during their careers. Those changes will require that they develop new skills. When we look at the ages, on average, of the teachers in the countries in the TALIS study, 59 percent are forty or older; 30 percent are over fifty. This suggests that many have been practicing for a long time since completing their initial education. On average, teachers have sixteen years of experience. Given the new demands on schools, such as those created by more ambitious curriculum standards, teachers would benefit from opportunities to develop competencies to construct learning opportunities for their students that can help achieve those aspirations. The age

for

distribution of the teacher labor force in the countries in our study varies; Mexico and the United States have the largest percentages of teachers over age forty (58 percent and 56 percent), whereas in Chile, it is 51 percent, and in Singapore, only 30 percent. There is less variation in the years of teaching experience, suggesting that teachers' careers begin at different ages in these countries. On average, teachers have fifteen years of teaching experience in Chile, sixteen in Mexico, ten in Singapore, and fourteen in the United States. Singapore has distinctly younger teachers, suggesting that they are more likely to have been educated in programs reflecting more recent curricular priorities than teachers in the other countries.

The initial preparation teachers receive is generally at the tertiary level. Most teachers worldwide have completed a degree in a higher education institution; only 2 percent, on average, have not. In Mexico, however, 9 percent have less than a higher education degree, and at the primary level, 19 percent in Mexico have not completed a higher education degree. This suggests that the teachers in Mexico who are not graduates of a tertiary institution are likely to have less knowledge and fewer skills than those who have completed studies in higher education.

Most teachers—90 percent, on average—have completed a teacher education or a training program designed to prepare them to teach. The percentage who were specifically prepared to teach is much lower in Mexico, at 62 percent, compared with 86 percent in Chile, 99 percent in Singapore, or 95 percent in the United States. Not all teachers in lower secondary were prepared specifically to teach their current subjects. On average, 73 percent received subject-specific preparation in the subjects they are teaching, ranging from 61 percent in Chile, and 67 percent in Mexico, to 78 percent in Singapore and the United States. Not all teachers learned subject-specific pedagogy in their preparation program: only 70 percent did, on average, and even fewer participated in programs that included teaching practice, for an average of 67 percent. Most teachers feel prepared to teach the subjects they are teaching: 93 percent, on average, feel well or very well prepared, and although the feeling of preparedness is lower in Mexico at 76 percent, it is 86 percent in Singapore, 96 percent in the United States, and 97 percent in Chile.

Teachers vary also in the characteristics of the students they serve, which creates specific needs for preparation. On average, 21 percent in the TALIS survey work in schools where more than 10 percent of the students' first lan-

guage differs from the language of instruction. This figure is the same as the OECD average for the United States (22 percent), but higher in Singapore (89 percent), and much lower in Chile (4 percent) or Mexico (3 percent). One in four teachers (26 percent) indicates that they work in schools with more than 10 percent of students with special needs. This figure is much higher in the United States (63 percent), than in Chile (28 percent), Mexico (7 percent), or Singapore (1 percent). The percentage of teachers who work in schools with more than 30 percent of students from disadvantaged homes also varies, with 20 percent on average, but 65 percent in the United States, 55 percent in Chile, 44 percent in Mexico, and 6 percent in Singapore.

While the majority of teachers report having received professional development, most have not received professional development specific to the subject they are teaching, with wide variations among countries, which shows that the professional development teachers received is decontextualized from their specific practice. Among language and literature teachers, the percentage who report they have received specific in-service professional development in the subject they teach averages 30 percent, ranging from 61 percent in the United States, to 12 percent in Chile, 27 percent in Mexico, and 50 percent in Singapore. Among mathematics teachers, 27 percent have received specific professional development, ranging from 43 percent in the United States, 46 percent in Singapore, to 12 percent in Chile, and 31 percent in Mexico. For science teachers, 26 percent have received specific professional development, ranging from 46 percent in Singapore, 36 percent in the United States, to 14 percent in Chile, and 25 percent in Mexico.

While teachers do have many professional development opportunities available, these don't help them address their needs of practice, suggested by the fact that principals identify inadequate teaching practice as a factor constraining the opportunity for students to learn in many areas. For example, the TALIS survey interviewed school principals about the factors that they considered were hindering the schools' capacity to offer quality instruction. Of all factors mentioned, the shortage of qualified or well-performing teachers and the shortage of teachers with competencies in teaching students with special needs were the most frequent. The percentage of principals who replied that the shortage of qualified teachers hindered school quality was 38 percent, on average, and ranged from 57 percent in Chile, 56 percent in Mexico, to 51 percent in Singapore, and 34 percent in the United States. The

percentage who mentioned the shortage of teachers with competencies in teaching students with special needs, 48 percent on average, ranged from 52 percent in Chile to 58 percent in Mexico, 48 percent in Singapore, and 33 percent in the United States.

In summary, even though most teachers in the TALIS survey graduated from institutions of higher education and received some form of initial preparation, school principals indicate that one of the most important factors constraining the quality of instruction in their schools is the lack of well-qualified teachers. The explanation for this apparent contradiction is likely the varying quality of teacher preparation and higher education programs, the fact that many teachers are teaching outside the fields for which they were prepared, and the fact that professional development is, as established in the scholarly literature on teacher education, a long-term process where initial education needs support from continued opportunities for skill development; most professional development opportunities do not honor this continuum to build professional efficacy. Given the long-term nature of teachers' professional commitment, ongoing support to develop their skills is necessary.

Multiple forms of professional development are available to teachers, and most find the modalities they participate in valuable in terms of impact on their practice. Most teachers, 88 percent on average, participated in some professional development the year before their TALIS interview. This figure is 72 percent in Chile, 96 percent in Mexico, 98 percent in Singapore, and 95 percent in the United States. The most frequent forms of professional development are courses or workshops (71 percent had participated in one such course, on average), followed by conferences (44 percent). Less frequent are observation visits to schools (19 percent), observation visits to other organizations (13 percent), in-service courses in other organizations (14 percent), degree programs (18 percent), participating in professional development networks of teachers (37 percent), individual or collaborative research projects (31 percent), or mentoring, peer observation, or coaching (30 percent).

Table 1.1 summarizes the percentage of teachers who participate in various professional development programs in the countries we studied. Fewer teachers in Chile report participating in these various forms of professional development than teachers in other countries; proportionately more teachers in Singapore have access to the various modalities of professional development.

Teachers also have less frequent access to school-based professional development than courses or participation in conferences.

The content of professional development tends to focus on subject-matter knowledge and pedagogy, with relatively less attention to domains of practice that can help teachers personalize learning for students or cultivate holistic education. Table 1.2 summarizes the focus of the professional development teachers receive, and their appreciation of the impact such development had on their practice. Most teachers participate in professional development focusing on knowledge of subject matter (73 percent, on average) and pedagogical competencies to teach those subjects (68 percent, on average), and most value those opportunities as having a positive impact on their practice. Fewer teachers (56 percent, on average) participate in professional development covering knowledge of the curriculum. This figure is lower in Chile (55 percent) and the United States (66 percent) than in Mexico (90 percent) or Singapore (80 percent). For those who participate in such programs, this professional development is valuable. A little over half (57 percent) of the teachers participate in teacher professional development focused on student evaluation, and those who do consider it valuable. Even fewer teachers participate in classroom management programs (44 percent).

A much smaller percentage of teachers participate in programs that would prepare them to personalize learning, such as those covering approaches to individual learning (41 percent), use of technology in teaching (54 percent), teaching students with special needs (32 percent), and teaching in a multicultural setting (16 percent). Similarly, very few teachers participate in programs explicitly related to interdisciplinary teaching or teaching in ways that relate to future work or studies. In addition to the opportunities to gain knowledge, perspective, and skills afforded by conferences, visits to other schools or organizations, training courses, or collaborations with networks of teachers in other schools, teachers can learn on the job in ways that directly improve their practice. The results from the TALIS survey presented in table 1.2 show that most teachers have very few opportunities to be mentored in their school, with the exception of Singapore, where two-thirds are in schools where there is formal mentoring and coaching.

There is wide variation across countries in the percentage of teachers who have access to formal induction programs. On average, 49 percent report hav-

TABLE 1.1 Modalities of professional development available to teachers as reported in the TALIS survey (percentage of teachers who report that they have participated in each modality)

	Average	Chile	Mexico	Singapore	United States
Courses/workshops	71	55	90	93	84
Education conferences or seminars where teachers and/or researchers present their research results and discuss educational issues	44	30	39	61	49
Observation visits to other schools	19	9	11	24	13
Observation visits to business premises, public organizations, NGOs	13	9	12	21	7
In-service training courses in business premises, public organizations, NGOs	14	8	19	17	15
Qualification program (e.g., a degree program)	18	17	43	10	16
Participation in a network of teachers formed specifically for the professional development of teachers	37	22	41	53	47
Individual or collaborative research on a topic of interest to the teacher	31	33	49	45	41
Mentoring and/or peer observation and coaching, as part of a formal school arrangement	29	14	21	65	32

Source: Organisation for Economic Co-operation and Development, *TALIS 2013 results: An international perspective on teaching and learning* (Paris: OECD, 2014).

ing participated in an induction program. Singapore stands out for providing induction to most of its teachers (80 percent), in contrast to Chile, where only 37 percent participate in induction programs. In Mexico, only 57 percent do, and in the United States, only 59 percent do.

Mentoring, another process to support school-based professional development, is available to teachers in varying degrees. Some schools offer mentoring to some or all teachers, but just as many schools offer no mentoring. One in five teachers (26 percent), on average, is in a school where principals report no access to a mentoring system. Singapore consistently provides mentoring

Table 1.2 Participation in professional development opportunities to personalize learning (percentage of teachers who participate in each modality)

		<i>Average</i>	<i>Chile</i>	<i>Mexico</i>	<i>Singapore</i>	<i>United States</i>
Knowledge and understanding of subject field(s)	Percentage of teachers	73	68	88	88	70
	Moderate or large positive impact	91	94	95	89	83
Pedagogical competencies in teaching subject field(s)	Percentage of teachers	68	65	89	86	61
	Moderate or large positive impact	87	92	93	87	77
Knowledge of the curriculum	Percentage of teachers	56	55	90	80	66
	Moderate or large positive impact	84	86	91	87	78
Student evaluation and assessment practices	Percentage of teachers	57	52	81	70	72
	Moderate or large positive impact	83	87	88	84	72
Student behavior and classroom management	Percentage of teachers	44	41	67	45	38
	Moderate or large positive impact	81	91	88	79	67
Approaches to individual learning	Percentage of teachers	41	33	54	39	58
	Moderate or large positive impact	80	89	82	75	69
ICT skills for teaching	Percentage of teachers	54	51	73	68	49
	Moderate or large positive impact	80	87	84	73	73
Teaching students with special needs ²	Percentage of teachers	32	33	29	23	39
	Moderate or large positive impact	77	87	67	70	67
Teaching in a multicultural or multilingual setting	Percentage of teachers	16	18	27	19	24
	Moderate or large positive impact	77	84	77	75	61
Teaching cross-curricular skills (e.g., problem solving, learning-to-learn)	Percentage of teachers	38	46	67	36	50
	Moderate or large positive impact	80	92	85	75	64

		<i>Average</i>	<i>Chile</i>	<i>Mexico</i>	<i>Singapore</i>	<i>United States</i>
Approaches to developing cross-occupational competencies for future work or future studies	Percentage of teachers	21	29	39	17	17
	Moderate or large positive impact	79	91	83	74	69
New technologies in the workplace	Percentage of teachers	40	38	55	40	57
	Moderate or large positive impact	79	86	81	69	73
Student career guidance and counselling	Percentage of teachers	24	30	42	29	11
	Moderate or large positive impact	80	88	82	69	65
School management and administration	Percentage of teachers	18	26	36	33	16
	Moderate or large positive impact	76	85	75	72	64

Source: Organisation for Economic Co-operation and Development, *TALIS 2013 results: An international perspective on teaching and learning*, (Paris: OECD, 2014).

to most teachers, as only 1 percent are in schools with no mentoring, followed by the United States, where only 7 percent are in schools where mentoring is not available. Most teachers lack access to mentoring in Chile (74 percent) and Mexico (60 percent).

In the schools with available mentoring, it may only be for new teachers, for teachers new to the school, or for all teachers. On average, 27 percent of the teachers are in schools where mentoring is available only to those who are new to teaching; this figure is 2 percent in Chile, 8 percent in Mexico, 21 percent in Singapore, and 30 percent in the United States. On average, 22 percent are in schools where mentoring is available to all teachers who are new to the school, varying from 14 percent in Chile, 7 percent in Mexico, 47 percent in Singapore, and 45 percent in the United States. Finally, 25 percent, on average, are in schools where mentoring is available to all the teachers. This figure is 10 percent in Chile, 24 percent in Mexico, 32 percent in Singapore, and 18 percent in the United States. However, programs aren't always arranged so that the mentor teachers work in the same subject as the person

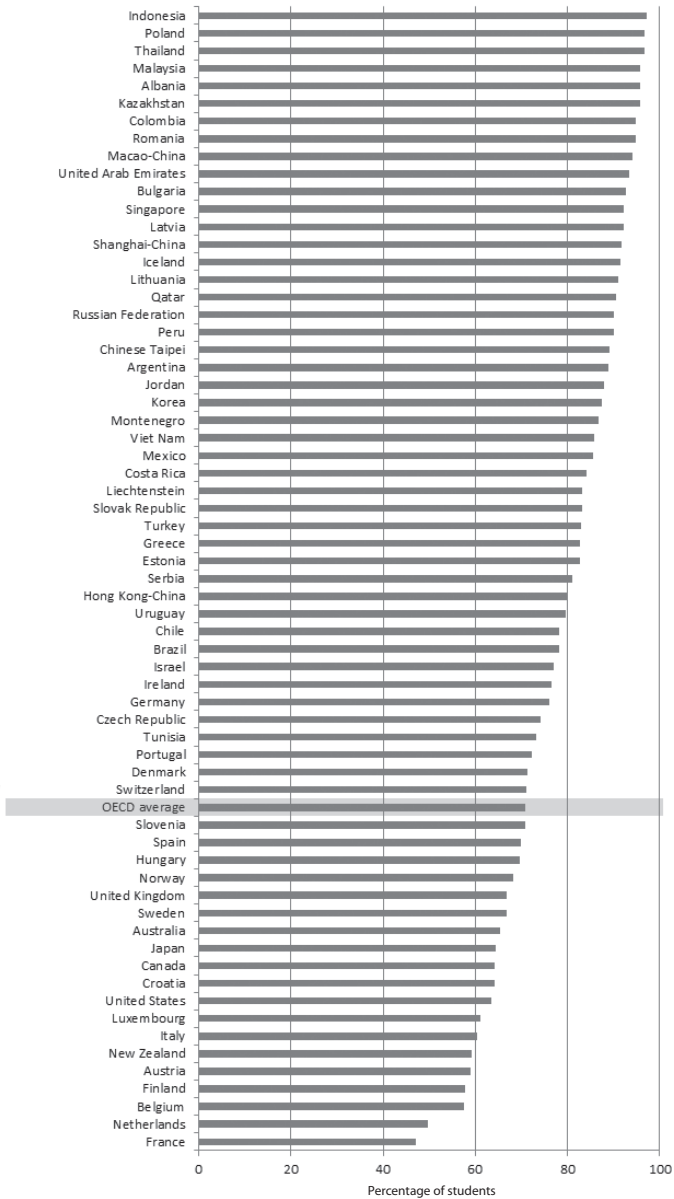
they are mentoring. On average, only 68 percent report this is the case most of the time. This figure is 50 percent in Chile, 55 percent in Mexico, 86 percent in Singapore, and 71 percent in the United States.

Principals' survey responses document a wide variation in the extent to which teachers work in well-aligned and supportive school cultures. When asked whether teachers share common beliefs about schooling and learning, 87 percent of the principals agreed, on average, but this figure is much lower in Mexico (66 percent) than in Chile (91 percent), Singapore (97 percent), or the United States (98 percent). Other indicators of the professional climate in the school include whether there are open discussions among staff about difficulties, mutual respect for colleagues' ideas, a culture of sharing success, and cooperation between the school and the community. On average, 93 percent of the principals report open discussions about difficult issues, ranging from 96 percent in Chile, 96 percent in Singapore, 88 percent in Mexico, and 83 percent in the United States. Respect for the ideas of colleagues averages 93 percent, ranging from 90 percent in Chile, 92 percent in Mexico, 99 percent in Singapore, and 93 percent in the United States. The culture of sharing success averages 90 percent, ranging from 88 percent in Chile, 87 percent in Mexico, 97 percent in Singapore, and 89 percent in the United States. Cooperation with the community averages 75 percent, ranging from 71 percent in Chile, 70 percent in Mexico, 86 percent in Singapore, and 83 percent in the United States.

Most teachers take responsibility for developing students, as reflected in the percentage who indicate that most students in the school believe that students' well-being is important (97 percent, on average). Most teachers also respect their students, as most indicate that the majority in their school are interested in what students have to say (92 percent, on average) and most (91 percent) state that if a student needs extra assistance, the school provides it. Most teachers (95 percent) and principals (98 percent) report that relationships between students and teachers are good. In spite of the apparent priority teachers and principals give to the well-being of students, there is wide variation across countries in the percentage of students enrolled in schools where teachers agree that the socio-emotional development of students is their responsibility, as seen in figure 1.1.

School leaders can play a very important role creating conditions that foster organizational learning and teacher professional development. On aver-

FIGURE 1.1 Reporting percentage of students in schools where there is agreement in socio-emotional development as a priority for teachers



Source: Organisation for Economic Co-operation and Development, *TALIS 2013 results: An international perspective on teaching and learning* (Paris: OECD, 2014).

age, principals report spending about 21 percent of their time in curriculum and teaching-related tasks and meetings, with the balance in administrative tasks (41 percent), student interactions (15 percent), interactions with parents (11 percent), and interactions with community members (7 percent). There are variations across countries and schools in how principals exercise their leadership, but the time they devote to instructional leadership is consistent across countries. On average, the percentage of time principals spend in curriculum and teaching-related tasks is 27 percent in Chile, 22 percent in Mexico, 22 percent in Singapore, and 25 percent in the United States.

Principals deploy a range of strategies for instructional leadership. Most collaborate with teachers in addressing disciplinary issues (68 percent on average). This figure is 80 percent in Chile, 75 percent in Mexico, 64 percent in Singapore, and 79 percent in the United States. Only one in two observe classroom instruction: this figure is 72 percent in Chile, 64 percent in Mexico, 59 percent in Singapore, and 79 percent in the United States. About two-thirds actively promote cooperation among teachers to develop new practices: this figure is 85 percent in Chile, 72 percent in Mexico, 65 percent in Singapore, and 75 percent in the United States. Over two-thirds (69 percent) encourage teachers to take responsibility for their own professional development: Chile, 88 percent; Mexico, 75 percent; Singapore, 84 percent; and United States, 78 percent. Three in four principals encourage teachers to take responsibility in regard to student learning outcomes; specifically, this figure is in Chile (93 percent), Mexico (86 percent), Singapore (91 percent), and United States (87 percent).

Most principals have a plan to achieve school goals and have created a professional development plan for the school. The percentage of principals who reported that they used student performance results to develop the school's goals and programs is 89 percent on average, and 86 percent in Chile, 96 percent in Mexico, 99 percent in Singapore, and 95 percent in the United States. The principals who worked on a professional development plan for the school is 79 percent on average, and 78 percent in Chile, 86 percent in Mexico, 99 percent in Singapore, and 94 percent in the United States.

Effective Teacher In-service Professional Development

Emerging research on teacher professional development underscores that teachers have different needs at various points of their professional trajectories

and highlights the importance of understanding teachers' work as socially situated, and of the power of peers and school networks.³⁴ Teachers learn from their peers, and those with more supportive peers become more effective.³⁵ Novice teachers increase their effectiveness more rapidly when they have skilled colleagues teaching in the same grade or when they have opportunities to learn from colleagues in their schools.³⁶ This research also highlights the importance of networks of schools in supporting teacher improvement, and teachers who do their initial education practicums in schools with less developed support networks are less effective upon graduation.³⁷ Teacher development is also contingent on the conditions of the schools in which they teach, and teacher improvement is greater in more effective schools.³⁸ This scholarship on the socially situated nature of teaching underscores the significance of professional development that is tightly coupled with teacher practice and with the contexts in which they work. This scholarship builds on the idea that much adult learning takes place in contexts of practice; various studies confirm the effectiveness of communities of practice, teacher networks, and professional learning communities.³⁹

The research highlights that professional development must respond to teachers' needs. Their needs are a function of the demands they must meet, as reflected in policy directives, for example, their students' requirements and their own gaps in knowledge and skills, which are a function of their prior education. The adequacy of professional development is context specific on those dimensions. The needs for development are different for teachers with varying levels of educational attainment and initial preparation, for those with varying years of professional experience, and for those serving different populations of students.

Emerging views of teacher professional development conceptualize quality not as an individual production, but as a team sport. Andy Hargreaves and Michael T. O'Connor define it as collaborative professionalism, which is "how teachers and other educators transform teaching and learning together to work with all students to develop fulfilling lives of meaning, purpose, and success."⁴⁰

Paradoxically, the significant clarity regarding the importance of supporting teaching quality along a continuum of professional development and the knowledge of what policies can support it have not translated into adequate opportunities for students to develop the competencies they need to thrive in

the twenty-first century. Far too many schools miss opportunities every day to empower students with the competencies necessary to become architects of their own lives and contributing members of their communities. The Organisation of Economic Co-operation and Development has, since 2000, worked with a growing number of countries assessing higher-order skills in language, mathematics, and science of fifteen-year-olds who are enrolled in school. The results of the Programme for International Student Assessment (PISA) show that many students fail to gain essential competencies to participate civically and economically, and document very wide disparities in the competencies students from different socioeconomic backgrounds demonstrate.⁴¹

Many of these missed opportunities are the direct result of inadequate and ineffective teaching. In many countries, teachers have not been well prepared and are inadequately supported. These limitations will be compounded as countries embrace more ambitious curriculum standards if the continuum of teacher professional development is not aligned with expanding aspirations. Advancing knowledge of how to design a professional development continuum, aligned with making education relevant and motivating, and empowering teachers and students to transform schools and classrooms into twenty-first-century learning institutions, is essential. The purpose of this book is to advance knowledge about the forms of preparation that support teachers in leading instructional practices in order to help students develop competencies, concurrently, in the cognitive, intrapersonal, and interpersonal domains.

OVERVIEW AND KEY THEMES

We conclude that teacher professional development is critical to translating curricular aspirations about twenty-first-century competencies into new teaching and learning practices in schools. We identify and study programs in various countries that have successfully transformed the culture of schools and instructional practices to advance multidimensional education, addressing cognitive, emotional, and social domains. The research team in each country participating in the consortium mapped the programs that they recognized as effective in advancing twenty-first-century education and selected one that had achieved sufficient scale, maturity, and stability for study. We developed research questions and instruments to conduct interviews and examine documents for an analysis of the program as the participants experienced it.

Our overarching goals are to understand the ways these programs support the development of teacher capacity to lead twenty-first-century pedagogies, advancing deeper learning and personalization. The following chapters focus on uncovering the theories of change in these organizations and on studying the operation of the programs in practice. Our main goal is to discern how support for teachers equips them with the skills and dispositions to translate curriculum into twenty-first-century pedagogy.

Importantly, we focus on analyzing the theory of change of each program, understanding how it plays out in its implementation and gaining a deep sense of the lived experience of the student and of the teacher, staff, and school or system leaders participating in the program. We provide information on evaluations of the results and outcomes of each program when available, but evaluating the fidelity of the implementation as each program has scaled and its effectiveness through rigorous experimental designs is beyond the scope of our study. While we believe that such analysis is valuable, our focus here remains on uncovering *how* organizations, schools, and teachers implement twenty-first-century education within programs that have already scaled; we think that rich and valuable information appears in this analysis.

Additionally, our unit of analysis remains at the program level. While we drew the programs examined from the full range of countries involved in the Global Education Innovation Initiative, even within these countries, there may be a variety of social, cultural, economic, and other diversity such that we cannot extrapolate the learnings from these programs to the country level. Rather, we consider that the most valuable lessons from our analysis will be in understanding how different *programs* in a variety of contexts can support teachers in bringing twenty-first-century education to life.

Given our belief that twenty-first-century competencies can be fostered in a variety of curricula and approaches, we intentionally did not set out to select programs that were similar in approaches (e.g., all science programs, or all civic education programs). As a result, the programs cover various approaches, such as an inquiry-based science program, a program to introduce technology to support deeper learning, a life skills curriculum, among others. The programs vary also in terms of whether they focus primarily on developing teacher or principal capacity or whether they are whole-school reform programs.

In chapter 2, “Providing Relevant Twenty-First-Century Science Education for All Students: A Case Study of the Chilean Inquiry-Based Science Education Program,” Liliana Morawietz and Cristián Bellei analyze an inquiry-based science education program implemented in Chile since the early 2000s. The program advances a range of twenty-first-century competencies, as well as scientific literacy through a multidimensional intervention. The latter encompasses a highly structured, activity-based science curriculum supported with an intensive, immersive program of professional development for teachers and school administrators, frequent periodic coaching of teachers provided by a university-based consortium of scientists, in-school support of a master teacher, and professional communities across schools in a network supported by the program. In a context of abundant teacher professional development, but apparently too theoretical and disconnected from instructional practice, the chapter illustrates the benefits of a multidimensional strategy for professional development with clear guidance and support to teachers, aligned with the national curriculum, as well as the value of instructional materials aligned with the lesson plans. Existing evidence about the impact of this program shows that it is positive, although the intensity of resources required for support have subjected it to the vagaries of political change.

In chapter 3, “Building the Capacity for Twenty-First-Century Education: A Study of China’s Qingyang School District,” Xueqin Jiang and Zhi-juan Ma analyze the experience of a district selected as an experimental zone by China’s National Institute of Education Sciences. Qingyang District has more governance freedom than most districts in China, which it has used to advance system transformation to promote educational excellence and creativity among students, metacognitive skills, citizenship, and emotional regulation. The strategy to achieve these goals included professionalizing teaching and school leadership. The district relies on a Teacher Talent Center to build learning communities within the district, and to move high-performing teachers to low-performing schools and build professional teaching networks. The district also promotes to leadership positions those individuals who demonstrate excellence as classroom teachers and supports the professional development and growth mind-set of teachers and staff. Two key resources in advancing this strategy were multipronged, district-based, teacher professional development and ongoing student and school assess-

ment to identify improvement targets. These efforts aim at valuing teachers as professionals, creating a risk-taking culture, and supporting continuous collaboration and learning together among teachers. The district supports professional development through various mechanisms, including clusters of schools that collaborate in pedagogy and teacher education, partnerships in which high-performing schools help turn around a low-performing school, and alliances in which schools share resources and expertise. This chapter highlights the powerful effects of transforming the culture of education in an entire district, and how to align this work with a compelling vision for economic and social development.

In chapter 4, “An Inclusive, Whole-School, and Sustainable Approach to Building Teachers’ Capacity to Promote Twenty-First-Century Skills: Lessons Learned from the Public-Private Partnership of Escuela Activa Urbana in Manizales, Colombia,” Silvia Diazgranados Ferráns, Luis Felipe Martínez, and María Figueroa discuss a whole-school reform program to develop twenty-first-century skills in high-poverty schools. The program promotes active learning, student participation, and autonomy through a series of strategies and instruments, including student-learning guides to enable personalized learning, flexible seating arrangements, project-based learning, self-assessment, and school and classroom student governments. The program also depends on school-based professional development provided by communities of learning in the school, which emphasizes supporting student-centered learning and personalization. The program benefits from a supportive policy framework that specifies the development of citizenship competencies as intended goals of the curriculum. Those include cognitive skills such as decision making, problem solving, and creativity; relational competencies such as leadership, teamwork, communication, and environmental responsibility; management skills including information management and technological management; and personal and socio-emotional skills such as empathy, appreciation for difference, and inclusion. A partnership between a nongovernmental organization (NGO), a foundation, and local government has implemented the program. A well-developed theory of change undergirds the program, which specifies how professional development will produce changes in the school culture and build capacities to support the development of twenty-first-century skills among students aligned with the societal goals of peace, inclusion, and democratic life.

In chapter 5, “Developing Life Skills in Children: A Study of India’s Dream-a-Dream Program,” Aditya Natraj and Monal Jayaram study an organization that supports the development of life skills of children from disadvantaged backgrounds and has reached approximately ten thousand children directly and around eighty thousand children indirectly. Dream-a-Dream offers an experiential teacher development program that cultivates teachers’ mind-sets about the conditions in which their students can develop twenty-first-century learning, and the skills to become a facilitator of learning rather than “a sage in the stage.” The program also fosters teachers’ innovative capacities to develop solutions to the instructional challenges they face in personalizing instruction. The teacher development program is anchored in a creative community model that promotes using the arts to motivate learners to develop creativity, personal power, cross-cultural competency, and skills for leading purposeful lives, through methods like asking questions, reflecting on actions, and visioning.

In chapter 6, “Developing Twenty-First-Century Competencies in Mexico: How UNETE and School Communities Broaden the Goals of Education by Using Educational Technology,” Sergio Cárdenas, Roberto Arriaga, and Francisco Cabrera analyze the professional development approach of UNETE, an NGO created in 1999 to introduce technology to students in public schools that evolved to support the development of twenty-first-century competencies. This model integrates a school-based approach to improvement that provides technology to teachers, professional development on using technology in the classroom, and access to professional development through technology. Coaches work in schools developing participatory school improvement plans, which align school-based coaching with improvement needs that teachers identify. The program aims to help students gain technological literacy and advanced cognitive skills and to develop their character and social skills. Its multidimensional strategy integrates providing technology to support students’ engagement and motivation to learn, supporting teacher professional development through in-school and out-of-school coaches and professional learning communities, and providing technological resources for teachers to support personalized instruction. The chapter illustrates how a learning organizational culture can help adapt and refine an organization’s theory of action to make it more relevant to the needs and conditions of the schools it serves.

In chapter 7, “Creating Cultures of Learning in the Twenty-First Century: A Study of EL Education in the United States,” Connie K. Chung analyzes the multidimensional approach of EL in developing teachers’ and principals’ capacities that help students gain relevant, rigorous, and relational competencies. EL’s longest established program involves working directly with a network of 152 schools in 30 different states. The organization has a multipronged approach to providing in-school and out-of-school professional development, building professional communities and networks, and reenvisioning roles to achieve those goals. A more recent program has developed a high-quality curriculum and videos of pedagogical practices to teach such a curriculum, aligned with the Common Core, delivered online free of charge. It explicitly seeks to cultivate cognitive as well as interpersonal skills and character traits among staff. Its theory of action involves a clear vision and mission communicated to the schools it works with, capacity building and construction of school cultures aligned with that vision, and support in the development of a culture of learning in the schools it works with.

In chapter 8, “Working in Times of Uncertainty to Prepare for the Future: A Study of Singapore’s Leaders in Education Program,” Oon-Seng Tan and Ee-Ling Low analyze one of Singapore’s key programs to advance twenty-first-century education, an immersive program of professional development for school principals. The Leaders in Education Program is a six-month, intensive, cohort-based program that combines a range of learning opportunities to develop adaptive leadership capacities with a practicum in a placement site chosen to support the development of leadership without authority. It is delivered at the National Institute of Education, Singapore’s sole institution of teacher and principal initial education and professional development. It aligns with the twenty-first-century competencies framework Singapore’s Ministry of Education has adopted to educate students as confident persons, self-directed learners, concerned citizens, and active contributors. The program develops competencies in civic literacy, cross-cultural skills, critical and inventive thinking, communication, collaboration, and information skills. The development model for principals aims to prepare candidates for five roles: leading learning, leading culture, leading change, leading people, and leading nationally. These roles then translate into specific competencies that principal candidates are expected to develop, such as the capacity to formulate, communicate, and disseminate a clear mission and vision, the capaci-

ties to deploy various strategies of school development, and contextual and organizational awareness, among others. The program is based on a theory of change that balances the development of capacities in aligning an education philosophy to a model of practice. The capacities reflect on the results of implementing such models and refine them to make them contextually relevant and effective. This program of leadership development builds on the foundation established for human resource development of education professionals in Singapore, which provides each teacher ongoing development, feedback, and work experience in highly professional contexts. The candidates nominated for this program bring a strong foundation of teaching and instructional leadership, as well as demonstrated leadership potential.

The concluding chapter discusses the common themes emerging from each case study and relates them to the larger body of research discussed in this introductory chapter. The chapters underscore the following eleven key themes about promising practices in supporting the development of teachers' and leaders' capacities to advance twenty-first-century education:

- *The professional development programs reflect a conception of adult learning as socially situated and responding to current needs of teachers for learning.* This starkly contrasts with the kind of professional development programs available to most teachers, as we saw in the results of the TALIS study. The programs studied here aim to develop teachers' capacities to address needs they have identified for themselves, and to influence not only individual capabilities, but the social context of schools by including many adults whose roles intersect, such as various teachers, school administrators, and occasionally administrators outside the school.
- *This form of professional development involves sustained, extensive opportunities for teachers to build capacities, during an entire school year or spanning multiple school years,* that contrasts with the more prevalent opportunities of short courses out of the school. None of the programs examined in this book are short courses or workshops, although short courses may be part of a larger portfolio of opportunities. The programs recognize that teachers' careers develop alongside trajectories and that professional development is a staged process through which individuals advance. These trajectories may or may not exist as formal structures in the systems where these programs operate.

- *The modalities of professional development examined in this book vary.* They include independent study of new material, discussion with peers and others, individual or group coaching, demonstrations of new practices, independent research projects, and opportunities for reflection.
- *The curriculum of the programs covers a blend of capacities, from a broad focus on helping students develop capacities to a highly granular identification of particular pedagogies and instructional practices that can help students gain those skills.* The programs aim to develop the autonomy and agency of teachers as professionals, their capacity for independent learning, their desire for continuous learning and increased effectiveness, and their intrinsic motivation to strive for excellent teaching. While the programs do not consistently rely on mastery of learning approaches, they all expect teachers to gain demonstrable competencies and see the process of gaining such competencies as gradual. The programs require repeated cycles of accessing new knowledge, enacting such knowledge in new practices, receiving feedback on such practices, reflecting on the new practice, and iterating in a cycle of increased mastery of the new instructional practices.
- *The curriculum of the various programs reflects a view of learning that includes cognitive skills in interaction with dispositions and socio-emotional skills.* The programs are seldom just approaches to developing instrumental techniques, but include opportunities for teachers to see the relationship between these new forms of teaching to values that are important to them and that align with broader social purposes for students and communities. In terms of social skills, the programs help teachers increase their capacity to communicate, collaborate, negotiate, and lead.
- *Professional development includes exposure to visible routines, protocols, and instructional practices, where teachers see new forms of instruction or assessment in practice.* The programs rely on protocols, toolkits, frameworks, videos with demonstration lessons or pedagogies that help scale the programs with fidelity across a range of contexts.
- *The programs rely on a mix of opportunities for learning situated in the context of the schools where teachers work.* These include coaching in the schools and professional development communities within the schools, with opportunities for teachers to talk with colleagues in different schools and who have different roles from classroom teaching.

- *To support the intensive and sustained activities of professional development that these various programs advance, the organizations in charge build a range of partnerships with institutions outside of schools that contribute various types of resources.* They all depend on new forms of engaging parents and communities at large on behalf of students' learning.
- *The programs see teacher practice as situated in specific organizations and social contexts and, in general, adopt a whole-school approach, rather than helping individual teachers increase their capacity.* As part of their goal to create conditions that sustain new and more ambitious teacher practices, they explicitly aim to change organizational culture and often school structures and roles, for instance, extending learning time, reorganizing learning opportunities in the disciplines, creating time within the school day for professional development, or extending learning opportunities outside the boundaries of the school. Efforts to develop a shared vision among all school staff about the broader goals they are trying to achieve for their students—for example, “all students will succeed,” “we will all go to the top of the mountain”—are a common element of these processes.
- *The programs all develop capacities among teachers to advance pedagogies with the goal of developing competencies that are not formally assessed in the school or school system.* In this sense, the programs challenge the notion that “what gets measured gets done” and suggest that teachers can make decisions about what and how to teach that can transcend the formal accountability structures in the school.
- *The organizations that support the various programs all model a learning orientation.* They approach schools with an inquiry mind-set, engage in dialogue with school staff about their learning goals, use various forms of feedback to assess whether their work is achieving the intended results, and implement measures to course-correct and generate continuous improvement in their work.