International Lessons in Teacher Education

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A growing body of research has found that high-performing countries often share a common set of strategies for recruiting, preparing, and supporting teachers (Barber & Mourshed, 2007; Tucker, 2011). These countries not only recruit and train individual educators well, they deliberately organize the sharing of expertise among teachers and administrators within and across schools, so that the system as a whole becomes ever more effective. And they not only cultivate innovative practices, they incorporate them into the system as a whole, rather than leaving them as exceptions at the margins.

This article describes how two high-performing educational systems – Ontario, Canada and Singapore -- create policy systems designed to ensure quality teaching across communities – and compares their systematic approaches to the much less coherent policy system in the United States. These cases are drawn from a recently completed study of international teaching policy in which we examined, with colleagues, seven jurisdictions within five countries around the world that have worked to develop comprehensive teaching policy systems.[1] The broader study from which this article is drawn (Darling-Hammond et al., 2017, in press), describes how governments in these places have carefully developed, planned and implemented what we call a *teaching and learning system*, and the lessons that can be learned from these systems.

Methodology

The study employed a multi-method, multiple case study design in order to investigate the policies and practices that support teaching quality within education systems. In larger countries, both national and state or provincial policies were examined to develop an understanding of the policy system. In these cases, the state or province was treated as a case nested within the larger country case. The research was conducted during 2013-2015 following a common set of research questions and protocols for each type of data collection:

- A review of literature and document analysis regarding teacher development policies, practices, workforce characteristics, and trends for each jurisdiction;
- Analyses of international, national, and, where applicable, state data sources regarding compensation, work hours, surveys of teaching conditions and teachers' views;
- Recorded interviews with policymakers, government officials, education leaders, principals, teachers, and teacher educators in each jurisdiction;
- Detailed observations of activities in schools and classrooms, along with other key meetings and professional learning events in pre-service and in-service settings.

These data were triangulated through an analytic process that sought themes, along with efforts to surface disconfirming evidence, within and across cases.

We discuss the Ontario and Singapore cases here, because in some ways, they are most like states in the U.S. in their size and student demographics. Serving highly diverse student populations with large numbers of immigrants while seeking to meet more challenging learning standards geared to 21st century expectations, each of these jurisdictions has focused intently on how to develop and support higher quality teaching across all of its schools.

Ontario, Canada[2]

One of the highest-performing provinces in one of the highest-performing countries in the world is Ontario, where 28% of students are immigrants, nearly twice the proportion in the United States. In Toronto, the provincial capital, more than 100 languages are spoken. In this diverse context, teaching is a highly-respected profession, with low attrition and such substantial surpluses that many beginning teachers take substitute positions for several years until a permanent position becomes available. Ontario has become well-known for its systemic approach to school improvement that has sharply improved school outcomes over the last decade.

The Context for Teaching

Ontario went through a significant change in government and education policy in 2003, reversing an era of teacher-bashing and cuts to schools. The new government placed a strong emphasis on strengthening the teacher workforce: With investments in teacher preparation and development, a major leadership development initiative, and extra resources with technical assistance to low-performing schools, graduation rates and achievement levels climbed. Provincial and district general funds were even more intensely targeted to schools with greater needs, and the proportion of underperforming schools was cut in half, even as standards for student performance were raised. Achievement gaps between first-language English speakers and English language learners were reduced.

A key feature of the Ministry's approach has been to better connect policy to practice through a staffing model that brings experienced educators into the Ministry on rotating assignments in which they help shape policy and implementation plans.

Curriculum and Assessment. With no national curriculum, each province has developed curriculum guidance and programs of study that help organize teaching and teacher development. In Ontario, the Ministry of Education has established a research-based, educator-involved continuous cycle of curricular review, with the aim of keeping the curriculum current and developmentally appropriate. Periodic assessments in grades 3, 6, and 9 (math) or 10 (literacy) are used to provide feedback for improvement. Teachers are supported to develop methods that use "assessment as, of, and for learning" in a variety of ways, including "learning conversations, questioning, conferences, homework, tasks done in groups, demonstrations, projects, portfolios, developmental continua, performances, peer and self-assessments, self-reflections, essays, and tests" (Ontario Ministry of Education, 2010).

Attractiveness of the Profession. With strong improvements in the status and attractiveness of teaching, attrition has declined to about 4 percent annually (about half the rate in the U.S.). Salaries begin at or above the average of other occupations that require college degrees. For example, the salary of a fifth-year teacher is well above the average (at the 75th percentile) for individuals with university degrees working one full-time job. New teachers are highly committed to their careers; of those in their first five years, approximately 9 in 10 indicated that they will definitely or probably be in the teaching profession five years hence (Ontario College of Teachers, 2011).

Fewer than half of aspiring candidates are accepted into programs in Ontario. At the largest institution, the Ontario Institute for Studies in Education at the University of Toronto, only one in four candidates is selected. To enter teacher education in Ontario, candidates must demonstrate competencies set by the Ontario College of Teachers' Standards of Practice emphasizing moral commitments as well as knowledge and skills. In order to increase diversity in the teacher population, teacher-candidates who can bring knowledge of Aboriginal issues and connections with Aboriginal communities into their teaching practices are also a priority.

Teacher Education

All of the jurisdictions we studied paid most or all of the cost of teacher education for their candidates. And all were moving increasingly toward graduate level teacher education. In Ontario, the government covers about 60 percent of the cost of candidates' preparation, with additional incentives for those who will teach in high-need locations, such as more remote First Nations communities. A new policy enacted in 2015 doubled the minimum length of teacher education from one year to two years, which can be undertaken during or after the bachelor's degree, and doubled the minimum length of clinical school placements. The reforms also added an enhanced emphasis on diversity and students with special needs, as well as an increased focus on the use of technology.

Many programs are now following the lead of the largest program in the province, the University of Toronto / Ontario Institute for Study of Education (UT / OISE), which created a two-year master's level program for preparing teachers in 2003, with significant clinical practice at partner schools integrated with academic and pedagogical studies. With a strong program focus on equity, diversity, and social justice,[3] teacher candidates learn to undertake their own research as well as using research generated by others – another hallmark of teacher education we saw across multiple countries, from Finland and Singapore to Australia and China.

All programs are expected to support teachers' capacities to serve diverse populations of learners well, and several programs in the province provide models aimed especially at preparing teachers to teach native students. The most extensive is at Lakehead University, in the Northern city of Thunder Bay, which has Canada's only department of Aboriginal Education. Lakehead's set of teacher education programs focused on aboriginal cultures and traditions include courses in Native Languages (Cree & Ojibwe) and Indigenous Learning, as well as courses that address the context of teaching in Aboriginal settings, with clinical experiences that can include apprenticeships with elders or other cultural leaders, research projects, and the design of culturally relevant teaching resources, along with traditional student teaching.

All programs are designed to help candidates achieve Standards of Practice competencies set by the Ontario College of Teachers, which resemble the standards created by the National Board for Professional Teaching Standards in the United States. With a huge surplus of teachers in Ontario, policymakers decided that preparing fewer teachers more thoroughly and enabling them to be more successful from the start made sense. As in Finland and Australia, this greater success is anticipated as a result of merging theory and practice, focusing more on the sophisticated and targeted strategies needed for teaching students with a wide range of needs, and learning how to enact an "equity pedagogy" (Banks & Banks, 1995) in the classroom. A key Ministry official we interviewed noted that the changes

> …. were not purely a response to oversupply. It is as well a response to what teachers should bring to the table as 21st century learners and 21st century educators meeting the needs of a 21st century society: It is supporting teacher candidates to develop a mindset and culture of learning as learners who respond to the needs of all students…. (including) special education students and students from our Aboriginal communities. I see these as important issues in the new teacher education curriculum.

Induction

These same goals also inform the two-year New Teacher Induction Program, established in 2006 and funded by the Ministry. Both mentors and mentees receive shared release time for collaborative planning, classroom observation, and assessment of student work designed to enhance teachers' practice and support their commitment to continuous professional learning.

Mentors are selected for their teaching and mentoring skills and are trained within their district. They demonstrate teaching strategies, offer coaching and feedback, provide advice around classroom management and teaching strategies, and offer emotional support. A major emphasis is on helping novices manage professional relationships and learn to seek out the resources they need for ongoing growth and development.

Mentoring is designed to be supportive, rather than evaluative. Principals conduct two performance appraisals throughout the first twelve months, and, if not ready to be certified, teachers are given up to twenty-four months to improve. While a small number of teachers are counseled out, a major goal is to help novices become expert and keep them in the profession. With that in mind, the Toronto School Board – the largest and most diverse district in the province -- has extended mentoring for an additional two years beyond NTIP and has organized the four-year program to offer demonstration classroom learning: focused observations, debriefing, action planning, and co-teaching opportunities in various grades and subjects, along with professional learning for mentors.

The results have been noteworthy. More than 95% of new teachers renew their licenses in the province (Ontario College of Teachers, 2012), and 98 to 99% of Toronto's beginning teachers have been retained annually between 2005 and 2010. The result is a strong start on a career in teaching. As a University of Ottawa report concluded:

> Beginning teachers across Ontario are confident in their own abilities as teachers responsible for supporting student learning. They are satisfied with their choice of profession; they intend to remain in the teaching profession and a large majority would like to remain in the same school. (Darling-Hammond, 2013, p. 67)

Ongoing Professional Learning

Once teachers have joined the profession, there is a vast array of professional learning opportunities and supports available. The teachers' federations play a significant role, with thousands of teachers participating annually in activities developed "by teachers, for teachers." The government funds hundreds of teacher action research projects each year as part of a Teacher Learning and Leadership Program. These have had a profound effect on schools as they are disseminated through province-sponsored networks, conferences, publications, and other knowledge sharing vehicles. Time is made available for learning: 90% of respondents report

participating in professional learning activities during the school day (Directions Evidence and Policy Research Group, 2014).

Professional learning is linked to teacher evaluation, guided by an Annual Learning Plan, in which teachers set growth goals, along with a rationale, a set of strategies, and an action plan for achieving them. Ontario has a well-developed system for supporting teacher leadership opportunities – as mentors, action researchers, and leaders of school improvement strategies -- and for recruiting and preparing many as principals who are trained to support teacher learning and collaboration and further distribute leadership opportunities within the school. In a virtuous circle, these conditions make teaching attractive, support recruitment of talented individuals, and enable a well-prepared and committed teaching force.

Singapore[4]

A tiny island that became an independent country only in 1965, Singapore has rocketed in the past half century to become an international leader in education, although few of its citizens were educated beyond primary school 50 years ago. This surprising rise to prominence began with the release of results from the 2003 Trends in International Mathematics and Science Study (TIMSS), which showed that 90% of Singaporean students scored above the international average in mathematics and science. Singapore's fifteen-year-olds have also consistently ranked at the top in all subjects on the Program for International Student Assessment (PISA). Today, about 75% of young people complete a postsecondary technical or college degree; the remainder receive a well-resourced up-to-date postsecondary vocational training that prepares them for work, which is increasingly likely to be in one of Singapore's many multinational corporations.

Singapore's diverse multicultural and multilingual society is comprised primarily of Chinese, Malay, and Indian peoples, whose 'mother tongue' languages – Mandarin, Malay, and Tamil – are taught in all schools. Although English is the language of instruction in Singaporean schools, it is not the primary language for most students, all of whom become bilingual.

The Context for Teaching

With few natural resources, Singapore regards its citizens as its most valuable resource, placing education as a central concern in policy and government investment. The nation aims to develop internationally-minded, culturally-competent citizens with a high degree of literacy and technical expertise. Well-trained teachers are seen as a key vehicle to achieving this goal.

Design of the System. With a population about the size of Wisconsin condensed into a much smaller area, Singapore's Ministry of Education (MOE) takes on what would elsewhere be the functions of a national, a state, and a school district. This allows for a tight alignment of policy between schools, the Ministry, and the National Institute of Education, the country's only teacher training facility. The Ministry has organized 30 clusters of 10-13 schools each to support policy implementation, professional learning, and the sharing of good practices across schools. Educators are expected to contribute to the effective functioning of both their school and their school cluster.

A commitment to learning for all students is a feature of education in Singapore. All students are regarded as diverse learners with different potentials, and the role of government is considered to be that of equalizing educational opportunities to allow students to reach that

potential. This informs the approach to curriculum as well as school funding, which is pegged to student needs. Higher education is also heavily subsidized, with low tuitions and need-based aid.

Curriculum and Assessment. Since 1997, Singapore has worked to focus curriculum and teaching on creative thinking and learning for a global economy. The "Thinking Schools, Learning Nation" initiative emphasized the need to move away from rote learning and move towards engaged learning and has stimulated innovative pedagogies and technologies. The "Teach Less, Learn More" initiative, introduced in 2004, led to changes in the curriculum and examination system, including the introduction of project-based assessments to accompany the more traditional essay and oral components. Assessments are given in grade 6, 9, and high school and have had a strong influence on school curriculum.

Teacher Education

Teaching is a highly attractive profession in Singapore. Salaries are comparable to those of engineers. Tuition for teacher education is free, and candidates receive a salary while they are preparing to teach. In exchange, graduates must teach for 3 or 4 years, depending on whether they complete an undergraduate or graduate program of study. The vast majority stay in teaching for a career: annual attrition rates are typically below 3%. According to a Ministry survey, teachers stay because of a positive professional culture, competitive wages, and ample opportunities for professional development and career growth.

With these attractions, Singapore can be very selective in admissions to initial teacher education. In addition to review of their academic qualifications and an English proficiency test, shortlisted candidates are interviewed by a panel of experienced principals, who assess their aptitude for teaching, communication skills, passion for education, and the potential to be a good role model. Approximately one out of eight applicants makes it through the selection interview.

After an introductory course which treats issues like adopting a growth mindset, lesson planning, assessment for learning, and use of technology, they complete a brief stint as a contract teacher in a school under the wing of a mentor teacher. Only if they receive a good recommendation from the school and pass an assessment can they enter teacher preparation. Candidates can still be dismissed during the program, although this rarely happens. Successful applicants are assured of employment upon program completion.

All pre-service teacher and leadership preparation programs are conducted by the National Institute of Education, as are a range of in-service programs for teachers, mentors, and principals. Teacher education is guided by standards that were developed to support the 21st century competencies established for students and the nation's new vision of teaching and learning. The NIE has established a framework for teacher preparation that articulates the values, skills, and knowledge needed of a 21st Century Teaching professional who can develop learners who are problem solvers, critical thinkers, and contributors to the community. Competencies for teachers-in-training, modeled after those used in the teacher evaluation system for in-service teachers – begin with "nurturing the whole child;" continue with "winning hearts and minds," including helping to develop others; and conclude with "knowing self and others," including integrity, respect, resiliency and adaptability.

Singapore has been moving toward graduate-level training of teachers: about two-thirds of entrants now complete a one-year master's degree program, and one-third completing a four-year undergraduate program. Students complete a major in an academic discipline either before or during their preparation. Primary teachers are prepared to teach three subjects; secondary

teachers are prepared to teach two. Curriculum studies aim to equip student teachers with pedagogical methodologies for teaching specific subjects.

The teacher-education curriculum includes study of the academic subjects for which teachers are responsible; curriculum, teaching, and assessment; information and communication technology; teaching of language and academic discourse skills, character and citizenship, service learning, and research. A new school partnership model engages schools more proactively in supporting trainees during their practicum experiences.

At the NIE, candidates learn to teach in the same way they will be asked to teach. Every student has a laptop, and the entire campus is wireless. The library spaces and a growing number of classrooms are consciously arranged with round tables and groups of three to four chairs, so that students will have places to share knowledge and collaborate, complete with access to full technology supports (e.g., DVD players, video and computer hookups, plasma screens, etc.). The focus is on teaching for problem-based and inquiry learning, on developing collaboration, and on addressing a range of learning styles in the classroom. Teachers learn to develop assessment practices *of*, *as* and *for* learning: designing assessment tasks, integrating assessment into teaching and learning, providing feedback to help learners improve, helping students learn to self-asses, so that they can become reflective and self-directed.

The practicum component of preparation (22 weeks in the four-year undergraduate program and 10 weeks within the 16-month postgraduate program), is structured to build candidates' skills incrementally as they gradually assume more responsibility and reflect on their practice. In order to ensure that student teachers develop these reflective qualities, they are required to maintain a Teaching and Learning electronic portfolio to organize evidence of their learning, accomplishments, and philosophical development over time.

Induction

All new teachers are immersed a two-year **Beginning Teachers' Induction Program (BTIP)**. The BTIP aims to nurture both ethical commitments and their skills. A structured mentoring program within the school is typically overseen by the School Staff Developer who acts as a "mentor for mentors" while also coordinating professional learning in the school. Novices are assigned a trained mentor, typically in their subject area -- a senior teacher who serves as a pillar of professional support, offering technical assistance and modeling, socio-emotional support, professional development, resource sharing. Novices also receive support from others in the school. Ms Tan Hwee Pin, Principal of Kranji Secondary School, described the support for beginning teachers in this way:

> We welcome our Beginning teachers (or BTs) to our school as part of our Kranji family. It is important to induct them into our school's culture so that they know the role that they play and the expectations and standards required when they interact with our students. Our structured mentoring programme (SMP) is led by a team of seven senior teachers, under the advice of our vice-principal. Every BT or trainee will be given an experienced teacher as their mentor. BTs not only observe lessons of their subject areas, but also teachers from other subjects; I believe that every subject teacher has different strengths and they employ different pedagogies in different disciplines. By casting the net wider, new teachers will be able to assemble a repertoire of strategies, which they can activate when they become a full-fledged teacher.

Beginning teachers are typically given about 80% the teaching workload of an experienced teacher to take advantage of these resources. While novices are being mentored within their school, they attend in-service courses designed specifically for them, covering topics such as classroom management, parent engagement, teacher-student relationships, reflective practice, and assessment literacy.

Experienced teachers also receive mentoring assistance, as mentoring is considered a school-wide practice that benefits all teachers and encourages growth. Teachers in Singapore are much more likely to have an assigned mentor or to be a mentor than teachers in any other country participating in the international TALIS survey (OECD, 2014, p. 332).

Professional Development

Singapore provides substantial investment in the ongoing development of teaching. All teachers are entitled to 100 hours of paid professional development annually. In addition, teachers can make use of their scheduled nonteaching hours – about 20 per week -- to work with other teachers on lesson preparation, visit each other's classrooms to study teaching, or engage in professional discussions and meetings with teachers from their schools or across schools in learning communities. Teachers are also supported to conduct action research, lesson study or other teacher inquiry approaches on their teaching and to continually revise their teaching strategies in response to what they learn.

Both the NIE and the Academy of Singapore Teachers (AST) provide training for teachers, as well as mentors and senior teachers who help guide action research and other projects of each school's professional learning communities. Many teachers are involved in research and innovation projects examining their teaching and learning to better meet the needs of students. Findings from teacher research are shared at the departmental and school level, other local schools, and at local and international conferences.

School networks provide a further important source of professional learning for teachers. The cluster system serves as a professional learning platform for principals and teachers to share practices across schools. The professional learning work of the clusters is managed substantially by teacher leaders from each school, who receive additional training to help to build their leadership capacity so that they can, in turn, build the capacity of teachers in their schools.

Appraisal and Career Development

Much of this is made possible by the teacher appraisal system and career ladder, which are designed to identify teachers' strengths as well as needs, and to support training and growth opportunities for teachers on career paths in teaching, leadership, or senior specialist tracks. Those who embark on the teaching track become the senior teachers, lead teachers, master teachers, and principal master teachers who fulfill many of the mentoring, coaching, and professional development roles described above. The senior specialist track prepares teachers to become experts in areas such as subject matter curriculum, assessment, educational technology, or other strands within schools or the Ministry headquarters.

Those on the leadership track can become department heads, assistant principals, principals, and move into roles at the Ministry. Leaders are identified, cultivated, and recruited from among teachers who demonstrate potential to take on school leadership roles. For all of these tracks, training is provided at government expense before they take on their posts and ongoing development afterward. This well-developed policy system provides a continuum of support for teacher learning and leadership.

The U.S. Context

As we reflect on teacher preparation and development in the United States in light of these systems and others around the world (see, for example, Darling-Hammond, 2012; Darling-Hammond et al., 2017, in press; Wei, Darling-Hammond, & Adamson, 2010), two contrasting conclusions emerge: First, many of the innovative practices we saw in various countries exist and were often launched in the United States, from which they spread elsewhere in the world. Second, no state in the U.S. currently has a set of policies to support quality teaching stitched together in as coherent and continuous a fashion as what we saw in these systems, although some come closer than others.

For this reason, there are substantial teacher shortages emerging once again in the United States, with little purposeful policy to address them. This is function both of a 30% decline in teacher education enrollments since 2009 and the high attrition rates – about 8% annually – that the United States maintains (see Sutcher et al., 2016, in press). Traditional responses to shortages in the U.S. expand hiring by reducing standards rather than increasing incentives. This is especially true for those who teach in under-resourced schools serving low-income and minority students, further expanding the holes in the leaky bucket of teacher supply, as the least prepared leave at rates three times those of fully prepared teachers (Sutcher et al., in press, 2016).

The countries we studied, and others that rarely experience teacher shortages, have made substantial investments in teacher training and distribution in the last two decades, including

- Salaries that are competitive with other professions and equitable across schools (often with additional incentives for hard-to-staff locations),
- High-quality teacher education, usually at the graduate level and largely at government expense, increasingly including extensive practice teaching in linked partnership schools,
- Mentoring for beginners in their first years of teaching from expert teachers, coupled with a reduced teaching load and collaborative planning time,
- Collegial work settings offering ongoing professional learning embedded in 10-20 hours a week of planning and professional development time,
- Opportunities for expert, veteran teachers to lead research and innovation projects, curriculum development, professional learning communities, and mentoring.

While some states have, from time to time, pulled together a systemic set of supports for teaching that have created an integrated approach to improving compensation, standards, recruitment, preparation, induction, ongoing professional learning and career development (see below), these have been dismantled – in whole or in part – by political changes. Piecemeal components remain – more of them in some states than in others – but no state offers the full set of financial and programmatic supports we saw in Ontario and Singapore. Federal efforts to support teaching quality have largely been dismantled over the last 15 years, with few supports for financing candidates or programs of teacher education and little investment in mentoring or professional development.

Unfortunately, the United States lacks a systematic approach to recruiting, preparing, and retaining teachers, or for using the skills of accomplished teachers to help improve schools. With unequal resources across states and districts, and few governmental supports for preparation or mentoring, teachers in the U.S. enter:

- With little financial support for their preparation, except in rare circumstances,

- With dramatically different levels of training -- with those least prepared typically teaching the most educationally vulnerable children,
- Earning salaries typically below those of other occupations (about 70-80% of the wage level of other college graduates even after adjusting for work year differences) -- with those teaching the neediest students often earning the least,
- Working under radically different teaching conditions – with those in the most affluent communities benefiting from small classes and a cornucopia of materials, equipment, specialists, and supports, while those in the poorest communities often teach much larger classes, without adequate books and supplies,
- With little time for collaboration and uneven access to on-the-job mentoring or professional learning to help improve their skills (Darling-Hammond, 2012)

Still, the United States has been a leader in many areas. It was the initial source for articulating professional teaching standards in the 1980s, with the creation of the National Board for Professional Teaching Standards, which outlined standards for accomplished teaching and developed performance-based assessments to measure whether teachers could demonstrate those skills. In addition, more than 40 states have adopted related teaching standards for beginning teacher licensure developed by the Interstate New Teacher Assessment and Support Consortium.

These standards and the idea they could be used as a means to guide preparation, appraisal, feedback, and practice has spread across the globe and is now a feature of virtually all high-performing countries, including the ones we studied. Portfolios and other performance-based assessments for demonstrating competence and teaching strategies are also now a common feature of teacher education internationally, informed by U.S. advances.

Designs for teacher education programs that integrate much more extensive clinical preparation alongside interwoven coursework are also informed by U.S. program models, such as Master of Arts in Teaching models created in flagship up universities during the 1960s and 70s, as well as the pioneering work in Finland. We note, for example, that teacher educators in Singapore, Australia, Canada, China, and many other countries have visited U.S. programs, like those at Stanford, Bank Street College, Teachers College and other well-known graduate-level programs, and took specific ideas back to their programs to incorporate.

Program Features that Matter

Effective teacher education and mentoring programs exist in the U.S. and have been studied in terms of their outcomes regarding teacher preparedness and efficacy, employer ratings, entry and retention rates, and student learning gains. Two studies of highly-rated and highly-effective preparation programs that looked at program features (Darling-Hammond et al., 2006; Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009) identified similar features, including:

- Significant coursework in content and content pedagogical learning;
- A focus on helping candidates learn specific practices that they apply in classrooms where they are practice teaching alongside their coursework;
- Carefully-selected student teaching experiences, well-matched to the contexts in which candidates will later teach;
- Opportunities to study specific content curriculum;
- A capstone project -- typically a portfolio of work done in classrooms with students.

Other studies reinforce these findings (for a summary, see Darling-Hammond & Bransford, 2005), suggesting that candidates who have more opportunity to *study and apply subject-specific teaching methods* are more effective, and that the *quality, duration, and timing of clinical experiences* also appears to matter. Candidates appear to learn more from their fieldwork and coursework when they have opportunities to connect their coursework in real time to practice opportunities in the classroom. The care with which placements are chosen, the quality of practice that is modeled, the duration of the experience, and the quality and frequency of mentoring candidates receive also influence candidates' learning. And graduates who have trained in well-designed partnership schools--those that have managed to create a shared practice between the school and the university curriculum—tend to feel more knowledgeable and prepared to teach, and are rated as better prepared than other new teachers.

Despite this knowledge, and a substantial number of programs that have adopted these practices and developed strong preparation, the quality of teacher education in the United States is highly variable. For more than a century, efforts to professionalize teaching have contended with initiatives to reduce teachers' preparation through entry pathways that aim instead to be quick and cheap. The lack of funding for teacher education candidates in the U.S. is a major part of this problem, given that candidates must go into debt to enter a low-paying profession. This tug-of-war has played out in recent years as new, more sophisticated models of preparation have emerged at the same time as backdoor routes into teaching have proliferated.

Policy Strategies

The most significant reforms to professionalize teaching in the U.S. were launched in the late-1980s through the late 1990s. Policy initiatives aimed to design professional standards, strengthen teacher education and certification, increase investments in mentoring and professional development, and transform roles for teachers.

Both Connecticut and North Carolina eliminated perennial teacher shortages and improved teacher quality through similar strategies, reminiscent of what we saw in many high-achieving countries. Both states increased and equalized salaries across districts, so that all districts could compete in the marketplace for high-quality teachers, while strengthening teacher education and raising licensing standards to ensure more adequate background in content, pedagogy, and knowledge for teaching diverse learners. North Carolina required all public universities to achieve national accreditation and funded professional development schools. Connecticut strengthened state approval, extended clinical training, and required a master's degree for a professional license. In this way, supply and quality were improved simultaneously.

Both states instituted service scholarships and forgivable loans targeted to individuals preparing to teach in high-demand fields, and strong mentoring programs to keep new teachers in classrooms. Both also invested in extensive professional development for teachers and principals, aiming to create more productive school environments where strong instruction could flourish. North Carolina also adopted a groundbreaking performance-based salary increase—12 percent of base salary—for teachers who achieved National Board Certification – a process of demonstrating accomplished teaching that is associated with greater teacher effectiveness.

Both states experienced steep gains in achievement and reductions in the achievement gap on the National Assessment of Educational Progress, with Connecticut becoming the top-ranked state in the nation after a decade of these investments, and North Carolina posting the largest gains overall and for minority and low-income students of any state during that same

period of time (Darling-Hammond, 2010). A comprehensive study of North Carolina's teaching workforce also found that student achievement gains were significantly greater for students whose teachers were National Board Certified, as well as for those whose teachers had completed, before entry, the pre-service preparation programs the state's strategic policy investments had leveraged (Clotfelter, Ladd, & Vigdor, 2010).

Nonetheless, during the 2000s, federal incentives and many states' policies introduced a competing agenda to replace the traditional elements of professions--formal preparation, licensure, certification, and accreditation--with market mechanisms that allow more open entry to teaching, without the need to raise or equalize salaries or worry about how teachers could afford to be well-prepared. Advocates of this perspective have argued that teaching does not require highly-specialized knowledge and skill, and that such skills as there are can be learned largely on the job.

As a result of this bimodal approach, prospective teachers in the U.S. may enter with only a few weeks of training before entry, or they may enter through undergraduate or graduate pre-service programs of varying designs and durations. These programs – more than 1200 of them across the country -- differ in structure, content, and quality – and they are regulated differently across the 50 states. The content of courses can be dissimilar across venues and may or may not be connected to a clinical experience. Candidates may experience no student teaching or more than 30 weeks; they might be placed in a school with teachers who "need the extra help" but are not role models for skillful practice, or they might be placed in a professional development school that closely models highly effective practices that are taught in companion courses. As a result of this variability, it is difficult to generalize about teacher education in the United States.

The same is true of mentoring programs and on-going professional learning opportunities. A number of US studies have found that well-designed mentoring programs improve retention rates for new teachers, as well as their attitudes, feelings of efficacy, and instructional skills (for a review, see Ingersoll & Strong, 2011). Those with the best outcomes combine having a trained mentor teacher in the same subject area with released time to provide in-classroom coaching, a reduced teaching load, supportive conversations with the principal, seminars on key issues, and regularly scheduled collaboration and planning time with other teachers (Ingersoll & Strong, 2011). While some excellent programs exist – and are the basis for these studies – as of 2012, the most recent year national data are available, only one-third of U.S. beginners had access to the set of supports described above (Sutcher et al., 2016, in press).

Furthermore, the funding for these programs has been cut in many states in recent years as a function of shrinking budgets, and services have decreased. For example, those working with a mentor and supported by conversations with the principal dropped from 75% to only 59% between 2008 and 2012 (Sutcher et al., in press). Consequently, beginning teachers' access to high-quality mentoring and induction is much more variable than it was a few years ago.

And we know from a growing body of research that professional development that is sustained over time, grounded in collegial work around curriculum development and teaching practices in specific content areas; followed by immediate opportunities to apply these practices, often with peer coaching as a support; and refined by reflecting with others on student work and outcomes, has produced student achievement gains that were significantly greater than those of comparison group teachers (for summaries see Darling-Hammond et al., 2009; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007).

Yet national data show that during the NCLB era, the opportunities for teachers to engage in sustained professional learning opportunities (i.e. professional development of

more than 8 hours in duration) declined, and was increasingly focused on the least effective models of professional development: short-term workshops that research suggests are unlikely to influence practice and student achievement. While 90% of teachers experienced these, fewer than 25% of U.S. teachers engaged in more extended professional learning of the duration recommended by research (Wei et al., 2010, pp. A-58-59.)

By the end of the decade only 16 percent of teachers reported that their schools engaged in collaborative efforts – a decline of more than half since 2000 (when 34 percent did so). This should not be surprising: Data from the first Teaching and Learning International Survey (TALIS) indicate that American teachers spend more time working directly with children (27 hours per week) than those in any other OECD nation and have less time for planning or collaboration. The TALIS average is 19 hours a week with children – fully 8 hours less – which allows much more time for job-embedded professional learning, peer coaching, and collaboration (OECD, 2014).

In brief, the U.S. leads the world in research on what matters and what works in teacher development, and American educators have planted many excellent programs that are comparable to – and often have informed – exemplary work abroad. However, the American political system has lacked the capacity to create and sustain a system for supporting teaching quality in consistent, coherent, and equitable ways. Why that is true and how it might be changed is the topic for a different article.

To be sure, there are some states that have worked harder and more systematically at this agenda through many administrations and with little federal support; some have sustained this work for a length of time (although almost always experiencing pushbacks that undermine gains and require them to be refought). These states have developed more complete and better implemented systems of professional learning and support from which we can and should learn. As U.S. educators and researchers continue to work on these issues, our findings from international analyses suggest it is important to focus attention on the study of teaching and learning *systems* that address recruitment, compensation, preparation, induction, and professional learning in supportive working conditions that, together, create a strong profession. It is also important to learn how to sustain and scale up excellent initiatives, once they have been developed and proven, with policies that make them commonplace rather exceptions that may come and go. Without a greater focus on system-building, we are likely to innovate our way to failure, rather than to success.

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[1] The seven jurisdictions are: Singapore and Finland, the states of New South Wales and Victoria in Australia, the provinces of Alberta and Ontario in Canada, and the province of Shanghai in China.

[2] This section draws on Campbell et al. (2017, in press). [Title] San Francisco: Jossey-Bass.

[3] http://www.oise.utoronto.ca/ite/Home

[4] This section draws on Low et al., (2017, in press). [Title]. San Francisco: Jossey-Bass.