

Final Report

**Human Resource Issues in Education:
A Literature Review**

**Prepared for the
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Introduction

Human resource issues have come to be seen as central to every policy initiative in education around the world. While the “hot” issues in education invariably focus on student achievement, funding for education, and issues of access and quality, the factors which concern the recruitment, preparation, hiring, assessment and professional development of the workforce are key to understanding the issues themselves.

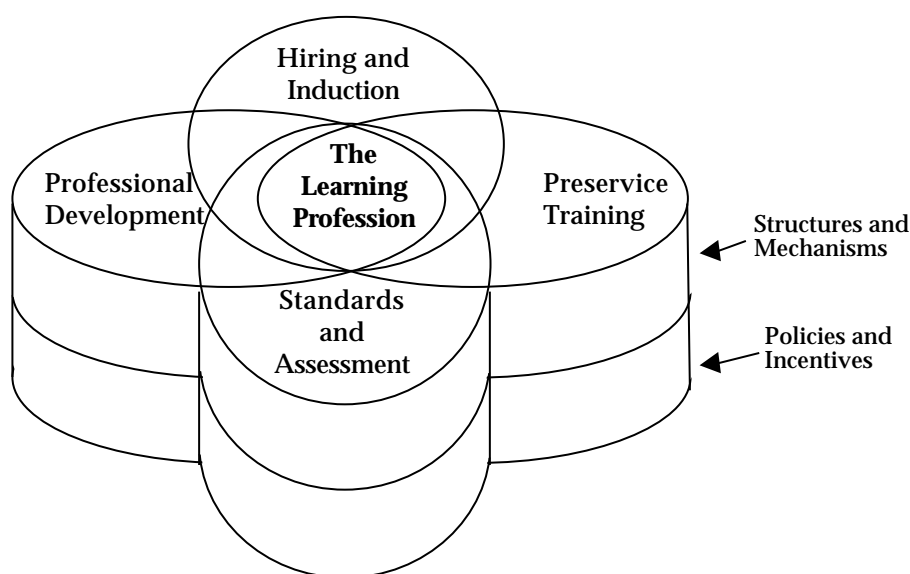
Yet it is only in the last decade that education systems have been considering the totality of the issues. For some time, there has been research and discussion about individual components — such as professional development — but it is during the 1990s that research and policy analysts have been examining how the components fit together: examining, in fact, a ‘human resource strategy’ for the teaching profession.

Our review of the recent literature has been undertaken in that context. While we examine the various component parts of a human resource strategy, it is the approach to the whole system that provides the richest research, and leads to the most effective practice. In this introduction, we describe our framework, our methodology, and provide a general commentary on the direction of the findings in this review. The remaining sections of this report provide details on the literature we have reviewed under the headings of the various component parts.

Framework for the Review

The model of human resource development and deployment which we have used to organize the literature review is contained in Figure 1. We believe that it has both theoretical and empirical justification, although attributing causal pathways in economic resource terms is very difficult.

Figure 1: *The Model of Human Resource Issued in the Learning Profession*



The centrepiece of the model is ‘The Learning Profession’. This is not just an abstract term, but a designation that is based on the observation that in the knowledge society — in a society that constantly generates new ideas and problems to be solved requiring intellectual, financial, and social resources — we need a teaching and principal force capable of learning on a continuous basis. There is considerable evidence that individuals and organizations that continually access and process knowledge in terms of designated goals and indicators of performance, are successful (Fullan, 1999, Keating and Hertzman, 1999).

The human resource issues which have an impact on this workforce must be viewed generationally in context. We need to identify the particular demographic, economic, social and political circumstances facing societies in the year 2000 and beyond. Without going into a detailed analysis, we can say that there is and will continue to be for the next decade, an enormous turnover of the teaching profession and administrative leadership in education in most countries. Not only will large numbers need to move into the system, but leaders will move rapidly upward as positions will need to be filled in record numbers. On the one hand, this presents a great opportunity to recreate the profession; on the other hand, the sheer size of the task and the capacity to take advantage of the opportunity are problematic to say the least.

Within this context, the values, motivation and capacity of educators will be the key resource for the educational system. Educators will need to work in much more collaborative, transparent conditions. 'What's Out There' is now 'In Here' (Hargreaves and Fullan, 1999). The boundaries of the schools are more permeable; the performance of schools is more visible; trust in all professions (especially teaching) by the public and politicians is more qualified. This certainly places more demands on the teaching profession, and under certain conditions can lead to demoralization and demotivation. But a confident, qualified profession is better positioned to address the criticisms and to take the risks of reaching out to form collaborative partnerships with parents, local communities, business and industry, and to engage public policy and accountability in a proactive and responsive way.

We have recently formulated a 'change formula' which is a working definition of the main elements of high performance:

Change Formula

$$E = mca^2$$

Where **E** = rate of Efficacy

m = motivation (will, purpose, emotional commitment)

c = capacity (skills, resources to problem-solve)

a² = assistance X accountability
(policies, training, etc. to affect 'm' and 'c',
while holding people accountable)

The goal of reform is to build a strong rate of efficacy: by building motivation, by increasing capacity, and by creating assistance and accountability. Within the goal of efficacy we include both the power to produce effective results, and the even more complex question of how resources can be used efficiently.

There is a further dimension in this equation. In human resource terms, the question is how a society can establish a framework of policies, incentives, structures, mechanisms and experiences that will continually develop the mca^2 resources in *individuals* as well as in *organizations* (schools, other systems). Thus, both 'individual' and 'collective' capacity is at stake.

The framework in Figure 1 enables us to review the literature with the above set of orientations as guiding questions. 'The Learning Profession' includes both the individual capacity and the collective capacity (which we will call 'Professional Learning Communities' when we examine schools as learning organizations). In the following four sections of this report, we examine the component parts of the human resource framework: recruitment and preservice training, hiring and induction, professional

development, and standards and assessment. Policies and incentives are examined in terms of their potential and actual contributions to developing and sustaining these four aspects of The Learning Profession. In the same spirit, we examine the structures and mechanisms which promote and support the workforce in all four component parts. We conclude our review with a discussion of the totality of the system, returning to the framework of the learning profession.

Methodology

This literature review has been undertaken to gain an understanding of human resource issues in education around the world. Our intent has been to gather material which gives us a sense of the variety of practices in place in various jurisdictions and discover what they tell us about what factors are important, and what factors are not.

Our approach to this review has been to find rich sources of data — sources which have both depth and breadth; sources which demonstrate change over time, and concrete evidence of impact on teachers' classroom performance, and ultimately student achievement. We looked for system-wide research, so that the evidence we cited would stand the test of applicability across a variety of schools and systems. We also gathered evidence of other literature reviews, particularly in the United States, to benefit from the work of others. With these objectives in mind, we put together a long list of sources, based on our own work and the work of others in the field, which reflected these criteria. We then focused our review on the richest sources of data.

Wherever possible, we have searched for empirical evidence of the relationship between investments and outcomes. It is clear, however, that

there is limited empirical evidence to be found. Researchers find it very difficult to quantify the inputs and outputs in education, and even more difficult to define the relationship between the two. While one would expect there to be a direct correlation between the ‘quality’ of teachers (itself a function of teacher qualifications, preservice training, and professional development) and the achievement of students, we know that other factors — particularly school environment and home factors — also exert powerful pressures on student achievement (Leithwood and Duke, 1999). The equation defining the causal relationship between the human resource issues and student outcomes is highly complex, and we are not aware of authoritative work which quantifies the impact of just one of the variables.

It is only in the last five years that some groundbreaking work has been done in this area — notably by the National Commission on Teaching and America’s Future (NCTAF); this is one of the largest reviews of research on teacher training and quality anywhere in the world, and one of the few to link these issues to student performance. Such research is not widespread: the vast majority of the research we have found is qualitative, giving us a deeper understanding of cases where a particular approach works.

We continue to be impressed with the volume of research coming out of the United States. Wherever we can, we have added work from a number of other countries — particularly Commonwealth countries — to give our review more breadth.

We conclude from this work that, while we are unable to quantify the impact of individual human resource variables on student achievement, we are confident that collectively, such factors as preservice training,

professional development, standards and assessment together have a strong and demonstrable impact on student outcomes in the educational system.

We realize that this review of literature on education has been undertaken to give the New Zealand Ministry of Education guidance in the development of policies for its own system. But the particular application of the research contained in the review to the New Zealand situation has been beyond the scope of our work. It is our hope, however, that this review provides a valuable context for the development of policy frameworks designed to fit the needs of students and educators throughout New Zealand.

Commentary

Before we get into the specifics of the research, it might be helpful to give a general commentary of the direction of the report.

First, in order for investments in teaching quality to have an effect, the policy approach must be comprehensive and systematic, i.e., all major components must be included and aligned. Also, the policies in question must be implemented with high quality. A good summary of the policy set, which we will explore in this review, is provided by Darling-Hammond (2000):

Of the 50 states, North Carolina and Connecticut undertook the most substantial and systematic investments in teaching during the mid-1980's. Both of these states, which share relatively large high poverty student populations, coupled major statewide increases in teacher salaries and improvements in teacher salary equity with intensive recruitment efforts and initiatives to improve preservice

teacher education, licensing, beginning teacher mentoring, and ongoing professional development. Since then, North Carolina has posted the largest student achievement gains in mathematics and reading of any state in the nation, now scoring well above the national average in 4th grade reading and mathematics, although it entered the 1990s near the bottom of state rankings. Connecticut has also posted significant gains, becoming one of the top scoring states in the nation in mathematics and reading (ranked first at the 4th grade level in mathematics and reading, and in the top five at the 8th grade level), despite an increase in the proportion of low-income and limited English proficiency students during the time. (Darling-Hammond, 2000, p. 13)

Second, investments in teacher (and later we will say principal) development must occur alongside greater focus on curriculum, instruction, performance standards for students, and corresponding achievement data. We know from the accountability movement that investments in curriculum and student standards do not by themselves make a difference. It is only when motivated and skilled teachers take up the work of curriculum, instruction and student performance that achievement gains are made. It is only when they do so in large numbers that large scale change is possible in a whole region or state.

Third, in conducting reviews such as this one, *context* is a crucial variable. Each country or state differs in its organization arrangements such as the presence or absence of local education authorities, and who and how teachers are hired and paid. Nonetheless, we have confidence that the factors and policy levers we have reviewed are generalizable. The specific forms of policy specification and action will vary.

Fourth, the overall conclusion from reviewing research on reform is that an integrated 'pressure and support' policy set is required. In return for high standards and greater performance on the part of teachers and schools, significantly greater investments are made in teacher quality and other aspects of the school system. The teaching profession becomes more elevated in the eyes of society (and in its own eyes) as the measurable performance of the education actually improves. Teaching becomes a desirable and highly respected profession.

Finally, the focus on state policy for teacher development and its impact on student learning is relatively recent. Many of the most developed examples are just being put in place. This means that much can be learned in the next several years through assessment of these efforts, learning from our own experiences and from those of others.

Teacher Recruitment and Preservice Training

There is a growing body of research on teacher recruitment and preservice training, but it is still the case that most jurisdictions do not have good data on recruitment strategies, on who comes into the profession and on the nature and impact of preservice teacher education.

The National Commission on Teaching and America's Future (1996) has conducted the most thorough empirical review of research on the costs and benefits of recruitment and training, and the effects of good practice in these areas. Moreover, the Commission established a follow-through secretariat to continue to conduct research and evaluation, and to help policymakers establish and monitor new policies which are based on the ongoing findings of the Commission. In this section, we look first at the problems of recruiting appropriate candidates, then at the preservice programs designed to prepare teachers for the profession.

Recruitment

Many jurisdictions around the world have been dealing in recent years with the challenges of a shortage of teachers entering the profession. Teacher shortages result from a number of issues in the education community. While bad forecasting on the demand side is occasionally cited, in most cases the problem has more to do with supply-side issues, such as the low appeal of the profession (poor career prospects, low salaries, poor working conditions, low status), low qualifications of the applicant, and inadequate numbers of graduates. The challenge for the profession is to attract a high number of applicants, and to ensure that the qualifications of the applicants are sufficiently high to meet the standards of the profession.

In data published by the National Center for Education Statistics in 1997, we see that between 25 and 53% of all American schools surveyed had teaching vacancies, and about half of those vacancies were considered “somewhat difficult, very difficult, or impossible to fill.” The Australian Council of Deans is projecting a critical shortage of teachers in the next few years; their research suggests that the “gap between demand and supply as reaching 7,000 by the year 2003” (Preston, 1997). Similar projections have been made in Canada.

Teacher shortages in the United States are highest in inner cities, and in areas of rapid growth in the South and the West. There are also shortages in particular subject areas, such as mathematics, physical science, special education and bilingual education.

Darling-Hammond (1999) blames teacher shortages on “inequities in salaries and working conditions, inattention to planning and recruitment, ... and inadequate incentives for recruiting teachers.” In the United States, the disparity in teacher salaries between the affluent suburban areas) and the less-affluent city centres and rural areas is acute. School funding is most often a function of the local district funding base, and poor districts cannot raise the funds to pay teachers well.

In Australia, research into the causes of the teacher shortages suggests that low salaries is also a factor there, although other factors — the increasing range of career options open to women, fears of litigation and high university fees — were also identified (Senate Employment, Education and Training References Committee, 1998).

Research also suggests that the perceived status of the profession has a considerable impact on its appeal to new entrants. In the United States,

Great Britain and Australia, teaching is considered to be a lower status career than many other professions; data on the academic abilities of students going into education compared to other professions shows that a high proportion of the most academically able students choose other professions, while teaching attracts a high proportion of students with lower academic abilities (Bishop, 1996). Conversely, France and the Netherlands have a higher perceived status for teaching, and select teachers from a pool of better qualified graduates.

Salaries provide a clear expression of a profession's status. NCTAF (1996) produced a definitive list of the salary data for teachers in the United States as a whole, and linked that data to information on the calibre of teachers in each state. In 1993-94, the average salary for an American teacher was \$35,813; in individual states, the averages are as low as \$25,153 (Mississippi). These salaries are considerably lower than those for other professions requiring post-secondary education (Bishop, 1996). There was a direct correlation between states with the lowest salary levels and those with the lowest ratings of teacher quality.

Other countries – in particular, France and the Netherlands — pay their teachers significantly better. NCTAF (1996) cites research which shows that many European and Asian countries support teachers by:

- pegging teacher salaries to professions like engineering and the civil service to prevent shortages of qualified teaching personnel;

- fully subsidizing candidate's tuition for a rigorous program of teacher preparation;

- providing beginning teachers with intensive mentoring, support systems, and reduced teaching loads so they can gradually learn to teach proficiently.

Research across the United States suggests that teacher shortages are regional. There are concerns that states or districts cannot stop hiring unqualified teachers without lowering the pool of talent. Yet Darling-Hammond (1999) shows that there is “substantial evidence in states and districts that pay attention to teacher quality ... that it is quite possible to create an adequate supply of teachers while simultaneously ensuring that they are well prepared to teach” (p. 5). States that have raised their salary levels, such as Connecticut, have seen a corresponding increase in the supply of teachers, and in the qualifications of those teachers who are available. In Canada, where average salaries are considerably higher than the United States, levels of teacher qualification are consistently higher, and the provinces experience only occasional cyclical shortages (Watson, 1998).

In addition to teacher shortages, a number of jurisdictions are expressing concern about shortages of principals in their schools. In many systems, the appeal of the job is so low that few good candidates apply for positions; this is particularly acute in systems undergoing major reforms and restructuring. Yet care and support for principals makes a great difference, both to the appeal of the job, and to the effectiveness of reforms. Pascoe and Pascoe (1998) report that the success of the reforms in the State of Victoria in Australia are due in no small part to the funding and support provided to the system’s principals, who were charged with responsibility for the implementation of the reforms. Principals were provided with salary incentives and increased funding for their schools in return for joining the reform efforts. Virtually all schools became part of the reforms within just a few years. We take up the issue of standards and development of school principals later in this report.

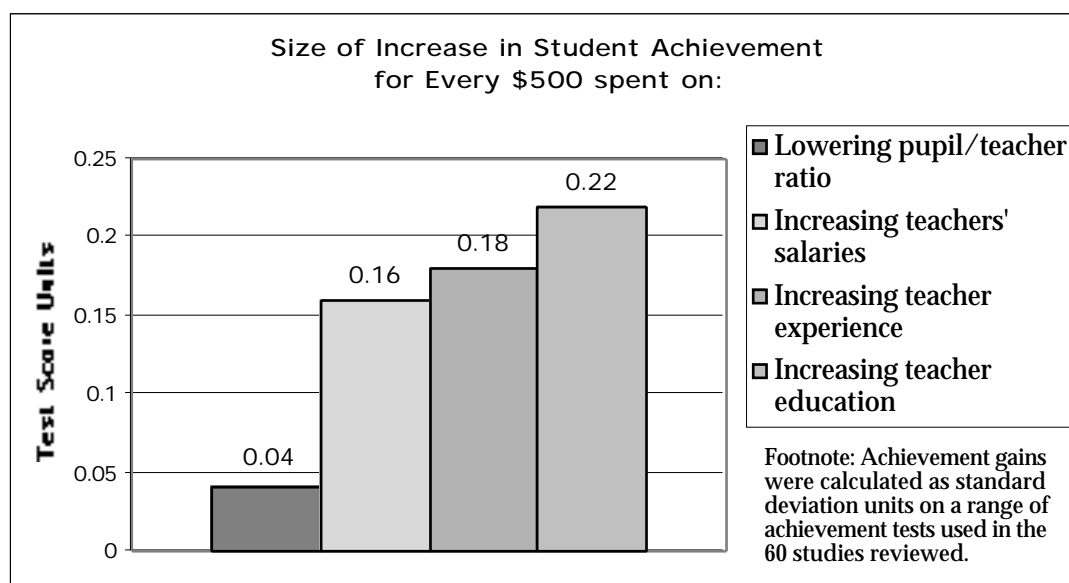
Teacher Training

We start with the case for teacher expertise:

Teacher expertise — what teachers know and can do — affects all the core tasks of teaching. What teachers understand about content and students, for example, shapes how judiciously they select from texts and other materials and how effectively they present material in class. Teachers' skill in assessing their students' progress also depends on how deeply teachers know the content and how well they understand and interpret student [work]. Nothing can fully compensate for the weakness of a teacher who lacks the knowledge and skills needed to help students master the curriculum. (Darling-Hammond and Ball, 1999, pp. 1-2)

NCTAF reviewed all the studies they could find on the relationship between teacher qualification and student learning. Two studies, in particular, provide a good summary of these results. First, Ferguson (1991) found that teacher expertise (as measured by teacher education, licensing, examination scores, and experience) accounted for a large variation in student achievement (over 40%). Second, Greenwald, Hedges and Laine (1996) reviewed over 60 studies and found that teacher education, and teacher ability, along with small schools and lower teacher/pupil ratios, are associated with significant increases in student achievement. In investment terms the authors display achievement gains by type of investment, finding that 'increasing teacher education' is a major component (see Figure 2).

Figure 2: Size of increase in student achievement for every \$500 spent on:



Greenwald, R., L.V. Hedges, and R.D. Laine (1996)

Pushing further, Darling-Hammond and Ball (1999) found that “teacher knowledge of subject matter, student learning and development, and teaching methods are all important elements of teacher effectiveness” (p.3); and that, “teachers who are fully prepared and certified in both their discipline and in education are more highly rated and more successful with students than are teachers without preparation, and those with greater training are found to be more effective than those with less” (pp. 3-4). With respect to the latter, the Commission’s review found that “graduates of five or six year programs that include an extended internship tied to coursework are more successful and more likely to enter and remain in teaching than graduates of traditional undergraduate programs” (p. 4).

Surveys of teachers in Australia conclude that teachers consider themselves inadequately prepared by their preservice programs (Dinham and Scott, 1996; Australian Teachers Council, 1995). In particular, educators

both in schools and at Faculties of Education agreed that, while practicums are an essential part of teacher preparation, the time spent in practicums was declining, as a result of cost constraints. The National Standards and Guidelines for Initial Teacher Education (Senate Employment, Education and Training References Committee, 1998) has recommended that teacher training programs allocate a minimum of 80 days for practicums.

Despite the clear endorsement of the importance of practicums, many teachers feel that the quality of teacher supervision in the placements is not what it should be.

There is some discussion in Britain and in Australia about moving teacher training out of universities and into the schools, as an apprenticeship; such programs have been instituted in some centres in Britain. Hargreaves (1996) suggests that the effect of this move to school-based teacher preparation “is not to enrich collaboration and collegiality but to return teaching to an amateur, deprofessionalised, almost pre-modern craft, where existing skills and knowledge are passed on practically from expert to novice, but where practice can at best only be reproduced, rather than improved.”

The comments to make teacher training more school-based seem to reflect concerns within the teacher community about the distance between theory (at universities and colleges) and practice (in schools). Instead of changing the structure of teacher education programs, a number of institutions are working to make schools a more central part of the teacher training process, by building links with schools which take teachers on practicums, and making supervisory teachers associates of the university.

The question for teacher education is ‘What should a strong teacher education program look like?’ In case studies of seven exemplary teacher education programs (defined as programs that have a consistently higher reputation among those hiring teachers) Darling-Hammond, (2000a) found that they had six common features:

A common clear vision of good teaching reflected in course work and clinical experiences;

A curriculum grounded in knowledge of child and adolescent development, learning theory/motivations and subject matter pedagogy;

Extended clinical experiences;

Well-defined standards of practice used to guide and evaluate work;

Strong relationships, common knowledge and shared beliefs among school and university-based faculty;

Extensive use of case study methods, teacher research performance and portfolio evaluation applied to real situations. (Darling-Hammond, 2000a)

These components are congruent with our own redesign of teacher preparation at the University of Toronto. The traditional 5th year program (eight months, September – April) on top of a four year Bachelor of Arts has consistently been evaluated as inadequate. We have now replaced this program with two streams: one is an extended one year program (September to June, including a new six week internship); the other is a two year master of teaching program which includes major internship in the second year. An evaluation of a two year pilot program with 100 students in comparison to the one year program showed that student teachers in the two year program felt significantly more prepared in their first year of teaching and were judged by employers as more prepared. We

are now following these teachers in their first years of teaching to see how they fare. Colleagues at Faculties of Education in Australia are taking a similar approach, with two year post-graduate courses already in place at three Australian universities.

The policy implications of the above findings need to be carefully understood. Before getting to initial conclusions one more set of findings from the *National Commission's* work is instructive:

State reform strategies during the 1980s that did not include substantial efforts to improve the nature and quality of classroom work have shown little success in raising achievement, especially if the reforms relied primarily on student testing rather than investments in teaching. For example, the two states to reorganize their reforms around new student testing systems were Georgia ... and South Carolina ... These states developed extensive testing systems coupled with rewards and sanctions for students, teachers, and schools. Although both states mandated tests for teachers, they did not link these assessments to emerging knowledge about teaching or to new learning standards, nor did they invest in improving schools of education or ongoing professional development. (Darling-Hammond, 2000a, pp. 14-15)

In comparing student achievement in geographically proximate states which used different strategies (Connecticut vs New Jersey; North Carolina vs Georgia; and West Virginia vs Virginia), Darling-Hammond concluded:

Although the states that have aggressively pursued investments in teacher knowledge and skills have equal or higher levels of student poverty than nearby states that

pursued other distinctively different strategies, their students now achieve at higher levels. (Darling-Hammond, 2000a, pp. 15)

It is important that such investments are made with an understanding of the standards required of such programs. Darling-Hammond (1999) commends the work done to set and monitor standards for teacher training institutions by the National Council for Accreditation of Teacher Education (NCATE); this Council has taken the initiative to provide accreditation to the 1200 teacher education programs in the United States. *A Class Act* (Senate Employment, Education and Training References Committee, 1998) recommends that a similar body be established for Australia; that body would also be responsible for teacher licensing, to ensure that teacher preparation was linked to the standards for teacher practice. In a similar approach, the Ontario College of Teachers in Canada has been given the legal mandate to accredit teacher education programs in that province.

There are several specific policy implications deriving from the above:

1. Establish a set of standards for what teachers should know and be able to do — standards which are assessed at the end of initial teacher training and/or at the end of the induction period (the first year or two of teaching). Mechanisms of assessment must be put in place.
2. Establish a set of standards for all teacher education programs and require that all programs be accredited on an ongoing, cyclical basis according to these standards.

3. Ensure that there are development opportunities for teachers and schools of education to meet the standards. In the case of students and initial teachers, redesigned high quality teacher education and mentoring programs (see next section on Hiring and Induction) provide the means of development. In the case of schools of education it means that higher education institutions must be committed to both faculty and program development.
4. Invest in the improvement of teacher salaries, pupil/teacher ratios, early childhood programs, but only if policies supporting 1-3 above are in place. In other words, any investment will be wasted if teachers are not prepared to take full advantage of the opportunity. For example, decrease in pupil/teacher ratios in the early years will not have an impact unless teachers are teaching differently according to proven teaching and curriculum standards.

We saw in the introduction that it is difficult to assess the cost efficiency of investment in teacher quality. We do know what kinds of investments have little impact (and therefore are a waste of money) and what kinds of investments have a positive impact (although a comparison of value for money is difficult to make). Nonetheless, in the recruitment and hiring of teachers a number of incentives should be used both to attract teachers in underrepresented groups (e.g., indigenous, math, science and technology) as well as to attract teachers of high quality. Among the incentives to consider are the following:

increase salaries as standards for licensing are established;

streamline licensing for out-of-state certified teachers; eventually recognize those who have received Board or Threshold status;

expand teacher education program in high need fields including scholarships;

provide incentives to expand/extend fifth year programs;

provide incentives for para-professionals to obtain certification;

create national recruitment incentives;

streamline hiring procedures, and develop on-line information technologies to recruit teachers nationally and worldwide. (Darling-Hammond, 1999)

The research priorities correspond to the policy agenda, and include the need for:

Studies which examine not only the supply of teachers but also an analysis of who is being attracted to the profession including why candidates choose teaching as a career;

Case studies of teacher education programs in attempting to identify features of especially effective programs (using methodology similar to that of Darling-Hammond, 2000a);

Follow-up studies of graduates of teacher education programs to determine how many enter teaching, and to assess recruitment strategies in relation to those who are hired.

Finally, in cost terms, attrition rates in the first five years of teaching should be carefully monitored by type of source of teacher. Teachers better prepared in the first place are less likely to leave, reducing the overall cost of producing teachers. And, as we shall see in the next section, systems with mentoring/induction programs for first (and sometimes second) year teachers reduce the attrition rate dramatically, saving money as well as increasing quality of teaching.

In any case, the redesign of recruitment efforts and initial teacher preparation must be part and parcel of the other major components in overhauling the quality of the teaching profession.

Hiring and Induction

The research on hiring and induction practices for new teachers and principals has been focused on case studies of particular practice, such as mentoring or certification. It is only recently that we have seen some interest in these areas; it is clear the interest is growing, probably fueled by a concern on the part of a number of educational systems that they are facing a shortage of qualified teachers, and that new practices are needed to attract and retain educators.

The literature we review in this section reflects research on system-wide practices, rather than the anecdotal cases of individual practice. The more general studies we have encountered, such as those from the National Commission on Teaching and America's Future, and the Senate Employment, Education and Training References Committee of Australia both make detailed references to the importance of more professional practices in these areas, and the policies which guide them.

The issues for policy makers are substantive and costly, as this example illustrates:

Of 600 students who enter a large four-year teacher education program early in their college years, only 180 complete the program, and only 72 actually get placed in teaching jobs. Of these, about 30 or 40 remain in the profession several years later. (NCTAF, 1996, p. 34)

We have already discussed in the previous section the problem of supply and demand for new teachers. Here we turn to the issue of attrition on the job, and corresponding matters related to hiring and induction practices.

Attrition

Darling-Hammond (1999) has gathered a considerable amount of data from across the United States on the attrition rates for beginning teachers. She concludes that at least 30% of new teachers leave within five years of entry. The rate is considerably higher for teachers in disadvantaged districts. The rate is also higher where there are no supports – orientation or induction programs – in place for beginning teachers.

In Australia, inadequate induction programs are blamed for high attrition rates; this is a particular problem in rural areas, where teachers (primarily from urban backgrounds) need time and support to fit into the different environment. This is also a concern for new Aboriginal teachers, among whom attrition is remarkably high (Senate Employment, Education and Training References Committee, 1998).

The cost of attrition, then, is acute, both in the hiring process itself, and in the dearth of experienced teachers who could provide leadership in schools. This problem is amplified when one considers that new principals are taken from the ranks of experienced teachers; the pool of talent from which to draw principals is very small indeed.

While the problem is clear, the solutions, relating to hiring and induction practices vary across jurisdictions, as the following evidence shows.

Hiring processes

Hiring practices vary primarily as a function of the balance between centralized and decentralized systems. Where highly centralized systems generally have a large pool of talent on permanent contracts from which

to draw, they are often characterized as inflexible, highly unionized, and having overly bureaucratic processes.

In contrast, decentralized systems (generally school-based) have great flexibility, and are able to hire for their specific needs, but may have to draw on a small pool of talent, which may not meet their needs.

New York City has been frequently cited as one of the centres where hiring practices bring a high proportion of unqualified teachers into the system. In 1992, just one-third of new teachers hired in New York were fully qualified. Yet the problem in New York had less to do with a lack of supply, and more to do with poor hiring procedures; a study by the New York Education Priorities Panel discovered that a substantial number of well-qualified new recruits were dissuaded from looking for work in New York City by excessively bureaucratic application procedures, inability to get information, inability to speak to hiring officers, and long delays.

New York has taken these criticisms to heart, and has changed hiring processes. Darling-Hammond (1999) reports that the city has undertaken the following initiatives to improve their hiring practices:

- bring city recruiters directly to students in local preparation programs each spring;

- offer interview and tests on-site at college campuses;

- recruit teachers in high-need areas like bilingual and special education through scholarships, forgivable loans, and strategically located recruitment fairs;

- work with universities and local districts to bring well-trained prospective teachers into hard-to-staff schools as student teachers, interns, and visitors;

make offers to well-qualified candidates much earlier in the year; streamline the exchange of information and the processing of applications. (Darling-Hammond, 1999, p. 21)

The result of these initiatives is that by 1997, two-thirds of new teachers had full qualifications when they were hired; in absolute terms, this is still a poor record, but the improvement from 1992 is significant, a clear indication that they are moving in the right direction.

There is a frequent political problem in the United States with timing of hirings: many jurisdictions cannot get budget approval until late in the summer, for start of school at the beginning of September, and hence cannot decide how many teachers they can hire. In other districts, it may take principals until mid-summer to find out how many teachers they need.

Studies in the United States suggest that much of the problem of teacher shortages could be solved with more improvements to the hiring process. This is particularly true in subject areas where there have been shortages over many years, such as science and math. Some proactive initiatives could be instituted to attract and hire qualified teachers, if some cross-system initiatives were in place. So far, however, there is little evidence that specific shortages are addressed in any systemic way.

The value of improving hiring processes is evident in New Haven, California, a school district that has made a remarkable turnaround in the last two decades. The district has brought about dramatic improvements by focusing on improving the quality of their teachers through a combination of recruitment, standards, development, and school organization. A key element in this strategy has been their use of recruitment strategies which

target good people, and uses a process of support and assessment to work with beginning teachers over their first two years of their careers, to ease them into the profession, and provide support for their development. Their recruitment strategy is to catch the interest of exceptional teachers, and then invest in resources to hire and keep such people in the system:

New Haven does not have large-scale recruitment crises annually because of the low attrition rate in their new and experienced teachers.... Clearly, one of the major recruitment efforts is the district's internship program; 38 of 80 [newly hired teachers] had worked as part-time interns in the district internship program. (Snyder, 1999, p. 13)

Induction, Orientation and Mentorship

There are many different approaches to teacher orientation or induction; in the last few years, many new programs have been developed and piloted, but there is little systematic research to evaluate the benefits of such programs. We are beginning to observe that programs with training and support for mentors, and specific support components for new teachers do make a significant difference with respect to whether teachers stay in teaching in the first critical years. Darling-Hammond (1999) reports that a number of districts, (Cincinnati, Columbus and Toledo, Ohio and Rochester, New York) “have reduced attrition rates of beginning teachers by more than two-thirds (often from levels exceeding 30% to rates of under 5%) by providing expert mentors with release time to coach beginners in their first year on the job. These young teachers not only stay in the profession at higher rates, but become competent more quickly than those who must learn by trial and error” (p. 20).

There are numerous descriptions of programs and projects in different countries which provide a range of approaches to induction. They vary according to length of program (usually one or two years) and degree of structure in the program. Several European countries provide support to beginning teachers (Germany, Belgium, Luxembourg), while others provide structured internships for teachers in their first years (France, Japan and Taiwan). In Japan, new teachers have a reduced load, allowing them to observe work in other classrooms, to take seminars, training; beginning teachers are allocated as much as 60 days for in-school professional development in their first two years.

In California, the state has introduced a Beginning Teacher Support and Assessment program (BTSA) to support teachers in the first two years of their careers. A formative assessment program has been designed as a structure for a beginning teacher to work with a mentor over their first two years. This structure includes mechanisms such as classroom observations, portfolios, and self-assessment. It integrates a process of assessment throughout the two year induction period, in tandem with the state's system of teacher evaluation. This program was implemented in 1998, so it is too early to evaluate its impact; that said, preliminary responses from participants are very positive.

In Australia, models of teacher education which include extended internships are being piloted in a number of schools, involving experienced teachers acting as mentors. The approach is considered to be an improvement over the normal preservice programs, and is expected to lead to increased retention of new teachers.

The Australian model of induction focuses on the first year of a beginning teacher's career, following the completion of preservice training, and

ending about a year later when the teacher goes through some sort of licensing process. The Schools Council has identified three characteristics of induction programs:

1. Beginning teachers should, as an entitlement, have fewer class responsibilities in their first year;
2. One or more experienced teachers should have designated responsibility for beginning teachers;
3. Beginning teachers should have ongoing training.

Queensland, the Northern Territory and the Australian Capital Territory all have detailed policies in place to implement these guidelines.

Australian research concludes that “the single most important factor in successful induction remains the quality of the mentors” (Senate Employment, Education and Training References Committee, 1998). It is unusual in the United States and Australia for mentors to be given release time to attend to their mentorship duties, or for beginning teachers to be given reduced workloads. This means that both beginning teachers and their mentors are doing their induction program in addition to a demanding full-time workload.

The problem is amplified when beginning teachers are sent to the most difficult schools. Schools which have a high turnover of staff often have 10- 15 new teachers each year. “In these schools, there are very few experienced teachers to give the induction/support needed for new staff. For the few experienced staff available, the added workload is a major source of stress” (Senate Employment, Education and Training References Committee, 1998).

School leaders also need mentoring. Although a number of systems operate programs to mentor new principals, generally, these tend to be informal. In cases where the programs are becoming more developed, they often do not encompass all candidates. Further, there does not appear to be any research on the effectiveness of such mentoring programs. We can expect to see the establishment of many more programs in the near future for school leaders which will provide a fertile ground for research. As one example, Britain has just recently created a National College for School Leadership whose mandate includes the development of comprehensive and intensive preparation and induction programs for new principals.

What conclusions can we draw? *What Matters Most* (1996) concludes that, as a result of induction programs, “Beginning teachers... become more effective as teachers because they are learning from guided practice rather than trial-and-error; and they leave teaching at a much lower rates” (p. 40). Where good examples exist, they are local or pilot projects, and few states have standards for all schools. There seems to be general agreement that induction is valuable, and makes a difference; the practice, however, suggests that, particularly in times of shrinking resources, induction is one of the first activities to be lost.

The impediment to implementing more induction systems is scarce resources, a difficult proposition at a time when most systems in the world are under pressure to reduce costs. Yet, as the Australian Senate Report says, “the costs [of induction programs] are likely to be significantly less than the costs of losing qualified teachers to the profession. Given the role of successful induction in increasing beginning teachers’ productivity and in retaining them in the teaching service such resourcing as is required should be viewed as an investment rather than a cost” (Senate Employment, Education and Training References Committee, 1998).

Despite some instances of good practice, many schools have no induction programs at all, and that of those that do exist, many do not meet these characteristics. The problem is generally described as relating to resources: schools do not have the time, materials and expertise to run effective induction programs. We conclude that induction programs with well-prepared mentors are essential, and furthermore, that it will require state policy, frameworks and funding to implement them. California's BTSA, referred to earlier, is one model worth considering. In any case, induction programs should be organized according to a standards framework which we take up in the subsequent section on 'Standards and Assessment'.

In terms of further research we recommend:

Induction and mentoring programs — The work here suggests that these initiatives are valuable and effective, but it is difficult to draw conclusions from a small number of case studies. This may be a fault of the programs themselves, which tend to be locally-based, rather than system-wide. Research over time on a system-wide approach to induction programs would make a valuable contribution to our understanding of their value and their practice.

Hiring practices — Our review has relied almost exclusively on reports on American practices in hiring; we suspect that other models are being used elsewhere in the world. There would be considerable value in research which linked the effectiveness of hiring practices to attrition rates in a school system, in a non-American context.

Professional Development

All sections in this report are interconnected, but the next two sections – professional development, and standards and assessment – are especially closely linked.

There is an enormous amount of research on the practice of professional development for teachers and principals. In undertaking a review of literature in this area, we have chosen to focus our work on research that demonstrates the link between sustained good practice and systemic change. The examples we cite — the UK, New York, and a variety of other American states — all describe the impact professional development has had on that education system. While the data is not quantitative, the research does provide strong qualitative support for good practice in the design and delivery of professional development.

In particular, we see a growing interest in the strategic use of professional development in the implementation of systemic reforms. OECD (1998) reports that a number of countries are now using professional development as a key mechanism in bringing about educational change. The examples we cite below reflect this shift in the way professional development activities are used in education.

The last decade in education systems around the world has been marked by the extraordinary volume of reform initiatives. We have seen a wide variety of structural and curricular resources mobilized to support these reforms. Our work on some of these initiatives has brought us to a conclusion shared by many others in the field: professional development

is key to the success of any reform initiative, provided that it is linked to ongoing learning of individuals, and to school improvement, and to related policy and program implementation.

What is different in the way we understand professional development today is the central position that such work has in the life of the whole school. Study after study is placing professional development activities at the centre of reform and instructional improvement (Elmore and Burney, 1999). In the UK, the *Department of Education Green Paper (1998)* links a commitment to professional development with school priorities, and the resources to implement them. The National Commission on Teaching and America's Future (1996) set professional development as a central element in their strategy for teacher quality. The Commonwealth of Australia, in its review of employment issues in education *A Class Act* (Senate Employment, Education and Training References Committee, 1998) identified professional development as one of two keys to improvement in the teaching profession (the other was preservice training).

School systems around the world make significant investments in the professional development of teachers and principals. Asian and European nations regularly invest in opportunities for teachers to upgrade their skills, observe exemplary practice, plan lessons and work collegially. Japanese teachers, for example, spend 40% of their working day on professional development and collegial work, compared with 14% for American teachers. (Stevenson and Stigler 1992; Stigler and Hiebert, 1999).

Conventional approaches have involved workshops and conferences where teachers are exposed to new ideas or trained separately by external 'expert' presenters. These workshops emphasize individual activity and

are often 'one-shot' courses, unrelated to other work and using passive learning. Yet qualitative research has made it clear that professional development programs must be collaborative, active, connected, and ongoing (Darling-Hammond, 2000). In this regard, quantitative studies of investment in professional development are of limited value. A study of eight OECD countries, for example, reported that investment in professional development ranged from 0.2% to 2.0% of education spending, and that the actual volume was much higher including self-directed programs (OECD, 1998). Unless we know how teachers go about their learning on a day-to-day basis, the quantitative figures by themselves are difficult to interpret.

Consensus is also emerging that the knowledge and skills of education can be increased substantially through collegial opportunities to solve authentic problems that span the gap between student performance and expectations (Hawley and Valli, 1999). This requires not just good programming of professional development, but also a collective approach to learning, throughout a school, or even a school system. If a teacher does not work in a professional learning community, where teachers work collaboratively, sharing passion and purpose for their work, then professional development is short-lived. The new approaches are shared, public and active; they promote sustained interaction, they emphasize substantive school-related issues, they use internal expertise, and they anticipate that lasting change will be a slow process.

The Characteristics of Effective Professional Development

Elmore and Burney (1999) have identified the characteristics of successful professional development as:

focusing on concrete classroom applications of general ideas;

exposing teachers to actual practice rather than descriptions;
offering opportunities for observation, critique and reflection;
providing opportunities for group support and collaboration; and
involving deliberate evaluation and feedback by skilled practitioners.

One of the most persistent findings from research on school improvement is the symbiotic relationship between professional development and school improvement (Hawley and Valli, 1999). School improvement cannot occur without a closely connected culture of professional development. "Staff development cannot be separated from school improvement" (Fullan, 1991).

The logic of investing in professional development is straightforward: there is no more effective way to undertake substantive change in schools. This paradigm shift about the attributes that constitute effective professional development while recognized is not yet common practice, although several examples are identified in the literature. What is less clear in the literature is how to 'go to scale': that is, to organize this professional development to maximize its impact and influence practice in a large number of schools and classrooms.

A more detailed illustration of the strategic use of professional development, and the impact it can have on a system, is provided by New York City School District #2. This case has been well documented by Elmore and Burney (1999), outlining the organizing principles and specific activities and models of staff development focusing on the system-wide improvement of instruction.

The district has an economically and culturally diverse student population of 22,000. Over an eight year period District #2 evolved a strategy for the

use of professional development to improve teaching and learning in schools. Central to the strategy was the creation of a strong belief system, or culture of shared values around instructional improvement. The organizing principles include:

everything in the system is about instruction and only about instruction;

instructional change is a long multistage process;

shared expertise is the driver of instructional change;

good ideas come from talented people working together;

set clear expectations and then decentralize; and

collegiality, sharing and respect.

In 1987, District #2 ranked 10th in the city in reading and 4th in mathematics, out of 32 districts. In 1996 it ranked 2nd in reading and 2nd in mathematics. These gains occurred at a time when the student population was becoming more linguistically diverse and economically poor. Improvements in the quality of teaching proved more powerful than the challenges to student achievement.

The issue of continuity and stability over time has required sustained commitment and focus on the part of policymakers and senior administrators. District #2 has demonstrated that focus is possible over an extended period. Continuity of district leadership, the creation of networks and structures to connect teachers and principals, commitment of resources, and attention to demonstrating the impact of changes on student performance have all contributed to that stability.

Several states in the U.S. are redesigning professional development to link theory and practice, and to create discourse that is content-based and

student-centred, that engages teachers in analysis of teaching and that supports the teacher as learner in an effort to heighten student achievement. Missouri has committed 2% of state education funds for professional development; Ohio has created regional teacher academies, supported by new technologies, managed by district teachers in collaboration with nearby universities. Maine supports university partnerships and regional school improvement centres, focused on teacher inquiry, school-based research and teacher study groups. California and Vermont offer state support for content-based professional development networks. Connecticut has a very well-developed system of professional development aligned with state policy directions.

It is important to understand that effective professional development is part of a system of learning. Looking at it from the bottom up, there is considerable evidence that professional learning communities at the school and district levels are fertile grounds for state policy that focuses on student achievement. Such collaborative cultures look outward as well as inward, and tend to be proactive, critical consumers of state policy – questioning, but taking into account policy initiatives.

Considering the top-down perspective, professional development, as long as it is part of a fabric of strategies, is essential for policy implementation. The National Literacy and Numeracy Strategy (NLNS) in Britain (which we are evaluating on an ongoing basis) is a case in point (Earl, Fullan, Leithwood and Watson, 2000; Barber 2000). The British government set ambitious targets to increase literacy and numeracy performance by the time students reach 11 years of age. Using a levels of performance set of indicators the percentage of students in 1997-8 reaching Level 4 (the targeted level) was 58% for literacy and 54% for numeracy; the targets for

2002 are 80% and 75%, respectively. By 1999, achievement had already reached 70% for literacy, and 69% for numeracy.

The causal pathways (and the stability of the results) are difficult to determine in the complexity of a multi-layered national effort. Among the strategies employed so far are:

- mandating a literacy hour and mathematics lesson in all schools;
- establishing a framework for what should be covered in the hour;
- developing support materials and teaching practices to guide what is done;
- creating new roles of assistance through literacy coordinators and consultants at the school, district, regional and state levels;
- focusing on professional development through these new roles and associated learning activities;
- setting local targets and feeding back student performance data in a timely fashion;
- orienting the evaluation efforts of OFSTED (the inspection system) to the implementation of literacy and numeracy.

In terms of the 'm' and 'c' parts of our earlier change model (motivation and capacity), the various activities have focused the interests and energies of teachers on literacy and numeracy. Early success has enhanced the motivation of teachers, while an increase in the capacity (deepening the skills and know-how) of teachers is still at the early stages (Earl *et al.*, 2000). The experience in Britain is much more complex than we are able to describe, but it is clear that professional development, defined as the sum total of learning through formal and informal experiences, is central to the strategy. Furthermore, it is likely that success is greater in situations where top-down strategies and bottom-up strategies intersect, i.e., a coordinated

state strategy goes further in schools in which principals and teachers work well together through school improvement planning and action. In such schools, principals and teachers are not at the mercy of state policy, but actually exercise greater influence and control over the details of the implementation.

In short, the key to professional development as we have defined it is not the workshops and institutes (although it includes these if they are connected to the ongoing learning in the school), but rather it is treating professional development as an integral part of developing learning communities at all levels.

As far as research is concerned, the link between professional development investments and levels of student achievement is one which is often evoked but never proven. The closest we come is in the work of Darling-Hammond, which demonstrates the link between student achievement and a basket of factors related to teacher quality, including professional development. We recommend a more targeted approach on the following topics:

Scaling up of professional development activities — While we have numerous examples of individual schools which have created a learning communities which make professional development part of the daily life of the school, we have very few examples of whole districts or systems doing so. It is only recently that research has been done on the problems of ‘scaling up’ programs, to spread good examples from one instance across a system. More research is needed on how this might be accomplished.

The combination of top-down and bottom-up strategies — Current research tells us that a balance between these two strategies is needed, in order for professional development programs to deliver real value.

Little work has been done to date to define this balance, or explore the mechanisms which would allow centralised systems and local schools to work together to produce effective professional development programs. The role of professional development in the National Literacy and Numeracy Strategies is one good case in point (see Earl, *et al*, 2000).

Standards and Assessment for Teachers and Principals

In this section, we examine the research concerning standards for the education profession, and the mechanisms in place to assess teachers and principals against those standards. We also profile the role that incentives play in making the standards work. There is much current research on these topics. Our review of this literature attempts to synthesize the current understanding of the value of standards and assessment. Many systems demonstrate a passion for quantifying performance measures, often in inappropriate ways. Our review has set out to identify research that shows the value of good practice in this area, while identifying the pitfalls of the practice from the 1970's and 1980's.

Why Standards?

The call for teachers to be licensed and to meet particular standards is part of a political movement of accountability: teachers are seen as public servants who should be accountable for their work to the public at large. Licensing has become increasingly popular in the U.S. through the 1980s and 1990s as a result of the perception that students are not faring well on tests of basic literacy and numeracy; politicians believe that teachers should be held accountable and efforts should be made to ensure that the situation improves. The argument is that setting standards for teachers will improve student performance.

There is a parallel argument for setting standards for teachers, coming from practitioners; the demand is not as vocal, or as prevalent, but the arguments have considerable power. This latter call is part of a broader movement to “professionalize” the discipline of teaching; the movement describes a range of areas in which teachers should demonstrate ability, and proposes a rigorous set of standards to demonstrate that teachers

should be considered professionals, in a similar way to doctors and lawyers. Standards are considered to be an essential element in both improving the abilities of teachers, and in proving to society that teachers are to be trusted and respected (see The Carnegie Forum on Education and the Economy, 1986; The Holmes Group, 1986; The National Commission on Teaching and America's Future, 1996).

The establishment of standards for educators has been until recently the sole reserve of government education authorities (departments of education or school boards), with little or no input from the profession itself. Darling-Hammond (1998) says that these public agencies "have tended to produce bureaucratic rather than professional controls over teaching – that is, controls aimed at standardized procedures rather than at building knowledge that can be applied differentially depending on the demands of a particular subject, the social context in a specific community, or the needs of a given child" (p. 6).

Framework for Standards

There are four levels of standards for the teaching profession. The first two – entry requirements for teacher education programs, and graduation requirements from such programs – have been discussed in an earlier section. The other two levels concern career entry, and advanced teaching standards, which are the focus of this section.

Teacher Testing: Basic Skills

There has been a considerable engagement in teacher testing in the 1980s and 1990s in the United States. It has been followed by Australia state initiatives; Canada and the United Kingdom have come to this work only in the last few years.

Most governments focus on standards for basic skills, and ignore the higher level skills which are seen to be the realm of good teachers. In so doing, they tend to de-professionalize teaching, as described by Brockhart and Loadman (1992):

What began with a model of professional decision making, using specialized knowledge in the best interest of clients, has been transformed into a model of following directions, of making sure that certain “good things to do” ... get done.... But in making professional measurable, they made it not professional. (p. 352)

Miles (2000) describes such general knowledge tests as ones which imply that the ability to read, write and do basic mathematics is all that teachers need to do; “If this were the case, serious credibility problems would be created for teachers, as every academically able person would feel as qualified as the teachers to perform routine teaching duties” (p. 4). In other words, the ability to teach requires more than subject knowledge.

A number of researchers suggest that the tests are so basic that the results are meaningless. Rudner (1988) reviewed the practices of 38 states in the U.S. in testing teachers for certification, and concluded that the basic literacy and numeracy skills being tested for are not the right skills on which to evaluate teachers. Poggio *et al* (1997) found little correlation between teachers’ scores on ‘paper and pencil’ tests and their abilities as teachers, and questions the validity of using such tests as the basis of “high stakes admissions and licensure decisions.” Moore (1991) found that grade point average had a higher correlation with measures of teacher effectiveness than did the results of the Core Battery Scores on the National Teacher Examination. Other research corroborates these findings.

“Garcia and Garcia (1989) argued that good teaching requires skills that cannot be measured by standardized tests; likewise, Hood and Parker (1989) declared that standardized exams do not provide an accurate measure of teacher competence”. (quoted in Dybdahl *et al*, 1997, p. 249)

Some research has raised a concern that such tests appear to discriminate against the admission of minority candidates into the teaching profession. Rudner’s review of teacher testing results in 38 states in the U.S. reported a significant difference in the performance of candidates from minority backgrounds on these tests; for example, the overall pass rates range from 63% to 95% but the pass rates were just 23% for blacks and 34% for hispanics on tests in Texas. Brockhart and Loadman (1992) found similar results. This, coupled with very low enrolment levels for minority levels in teaching, keeps their participation rates in the profession at a very low level. In the absence of developmental efforts to attract and support underrepresented groups, teacher tests by themselves are of limited value.

At times of teacher shortage, the problem of qualified teachers becomes a much more difficult proposition. In a number of states in the U.S., teacher shortages have caused systems to bypass the attempts to set standards for the teaching profession, and hire anyone willing to teach:

In California, for example, a state that has high standards for teacher qualifications, these standards were conveniently ignored recently when the state governor decided that class sizes for the first to third grade students should be reduced. Because many districts had trouble finding qualified teachers, a change designed to improve schooling instead left many children in inadequate physical facilities with untrained teachers. (Watson, 1998, p. 4)

The effect of hiring unqualified teachers is long term; Darling-Hammond (1999) quotes National Center for Education Statistics data that shows that, on average, 50,000 people have entered teaching every year without meeting standards for licensing. Assuming they stay in the system this group will affect the learning of millions of students.

The National Teacher Examination produced by the Educational Testing Service in the United States is the most commonly applied test of teacher competency. It had two parts: the Core Battery Test focused on basic literacy and numeracy, while the Specialty Area test was available for 42 subject areas. Both of these were multiple-choice tests.

The NTE tests have been the object of considerable criticism from researchers and educators alike (Shepard, 1989; Madaus and Pullin, 1987; Zimpher, 1990, and others) largely on the grounds that they do not correlate with teaching effectiveness on the job. These researchers find that the NTE tests correlate with academic grade point average, and conclude that the NTE tests add no new information about general knowledge and basic skills beyond that already known from previous academic records.

Overall, the research suggests that while teachers require basic knowledge, a written test is not an effective method of assessing such knowledge (whereas high quality accredited programs of teacher preparation would address basic knowledge). Moreover, tests of basic skills are not good evaluators of teaching skills, or for identifying individuals who will be good teachers. Rudner (1988) concludes that most teachers who are considered 'bad teachers' by the public — those who need to be 'weeded out' — would not be classified as such for their lack of subject knowledge or basic skills, but rather for their poor teaching techniques or human relations skills.

As a result of these concerns, Miles (2000) reports that “most of the competency-based, multiple-choice style teacher tests employed were eventually either withdrawn, or at the very least, shown to be invalid if used as the sole measure of teacher competence” (p. 12).

Standards for Teachers

Based on the experience in the 1970s and '80s in the United States, a number of organizations have been looking in recent years at other ways of evaluating teachers beyond paper and pencil tests. These assessments are new, with research results emerging on a preliminary basis. What follows are descriptions of some of the programs underway, and the research on their efficacy.

As a result of the criticism of its basic tests, the NTE created a new testing instrument, the PRAXIS series, which added a third test: the Classroom Performance Assessment. This third test consists of a structured observation of the teacher in the classroom, as well as an interview.

The National Board for Professional Teaching Standards (NBPTS) in the U.S. started in 1987 to develop a complex and detailed framework for certifying experienced teachers. The resulting certification program takes about twelve months to complete, and involves a variety of methods to profile the teacher's work with students, knowledge of subject, fluency with student assessment, and their own professional development.

The National Commission on Teaching and America's Future argued that:

Standards for teaching are the lynchpin for transforming current systems of preparation, licensing, certification, and ongoing development so that they better support student learning. [such standards] can bring clarity and focus to a set of

activities that are currently poorly connected and often badly organized.... Clearly, if students are to achieve high standards, we can expect no less from their teachers and from other educators. Of greatest priority is reaching agreement on what teachers should know and be able to do to teach to high standards. (NCTAF, 1996:67)

The NBPTS standards represent an excellent example of moving in this direction. NBPTS has developed standards in thirty subject matter disciplines, organized around five major propositions:

1. Teachers are committed to students and their learning:

National-Board certified teachers are dedicated to making knowledge accessible to all students. They treat students equitably, recognizing individual differences. They adjust their practice based on observations and knowledge of their students' interests, abilities, skills, knowledge, family circumstances, and peer relationships. They understand how students develop and learn. They are aware of the influence of context and culture on behavior. They develop students' cognitive capacity and their respect for learning. Equally important, they foster students' self esteem, motivation, character, civic responsibility and their respect for individual, cultural, religious and racial differences.

2. Teachers know the subject they teach and how to teach those subjects to students

National-Board certified teachers have a rich understanding of the subject(s) they teach and appreciate how knowledge in their subject is created, organized linked to other disciplines and applied to real world settings. Accomplished teachers command specialized knowledge of how to convey and reveal subject matter to students. They are aware of the preconceptions and background knowledge that students typically bring to each subject and of strategies and instructional materials that can be of assistance. Their instructional

repertoire allows them to create multiple tasks with knowledge, and they are adept at teaching students how to pose and solve their own problems.

3. Teachers are responsible for managing and monitoring students learning

National-Board certified teachers create instructional settings to capture and sustain the interest of their students and to make the most effective use of time. Accomplished teachers command a range of instructional techniques, know when each is appropriate, and can implement them as needed. They know how to motivate and engage groups of students to ensure a purposeful learning environment, and how to organize instruction to allow the schools' goals for students to be met. They understand how to motivate students to learn and how to maintain their interests even in the face of temporary failure. Board certified teachers regularly assess the progress of individual students as well as that of the class as a whole. They employ multiple methods for measuring student growth and understanding and can clearly explain student performance to parents.

4. Teachers think systematically about their practice and learn from experience

National-Board certified teachers exemplify the virtues they seek to inspire in students – curiosity, tolerance, honesty, fairness, respect for diversity and appreciation of cultural differences – and the capacities that are prerequisites for intellectual growth: the ability to reason and take multiple perspectives, to be creative and take risk, and to adopt an experimental and problem-solving orientation. Striving to strengthen their teaching, Board certified teachers critically examine their practice, seek the advice of others, and draw on educational research and scholarship to expand their repertoire, deepen their knowledge, sharpen their judgement and adapt their teaching to new findings, ideas and theories.

5. Teachers are members of learning communities

National-Board certified teachers contribute to the effectiveness of the school by working collaboratively with other professionals on instructional policy, curriculum development and staff development. They can evaluate school progress and the allocation of school resources in light of their understanding of state and local educational objectives. They are knowledgeable about specialized school and communities resources that can be engaged for their students' benefit, and are skilled at employing such resources as needed. Accomplished teachers find ways to work collaboratively and creatively with parents, engaging their productively in the work of the school (NBPTS, n.d.).

By the end of 1999, NBPTS had certified over 4800 teachers with over 100,000 more expected in the next decade. Because the program is at the early stages the research base is not yet developed. What is available is encouraging:

Teachers report that the process of analyzing their own and their students' work in light of standards enhances their abilities to assess student learning and to evaluate the affects of their own actions. (Darling-Hammond, forthcoming, p. 15)

In an early pilot study of the portfolio in the Stanford Teacher Assessment Project, "teachers reported that they improved their practice as they pushed themselves to meet specific standards that had previously had little place in their teaching" (Darling-Hammond, forthcoming, 15).

The NBPTS standards are being used in more and more states. Seventeen states have agreed to accept National-Board certification as the basis for granting a license to out-of-state teachers or as a basis for 'recertification' of experienced teachers. Moreover,

Eight [states] have agreed to offer higher salaries to teachers successful in achieving certification. School districts like Cincinnati, Ohio and Rochester, New York have incorporated standards into teacher evaluation criteria, using it as one basis for recognition as 'leader teachers' who mentor others and as a basis for salary increments in a performance-based compensation schedule. (Darling-Hammond, forthcoming, p. 22)

The new policy about to be implemented in Britain is another case in point. Standards have been developed for teachers to be assessed after seven years of teaching in order to obtain what is called 'threshold status'. The system is voluntary, there are no quota limits, and upon successful completion teachers will receive a 10% pay increase (paid by the state) on top of all normal increases.

There are considerable developmental costs to establishing a system of standards assessment. Once developed, the system can be run on a 'user-pay' basis. NBPTS, for example, costs \$2,300 for a teacher to take the assessment (often paid for by the employer) which covers the cost of assessors, etc. Once certified, additional pay is another cost. As we recommend the establishment of standards-based assessment, attention must be given to the costs of implementing the plan, the time-consuming nature of the process, as well as problems of reliability on the part of the assessors.

NBPTS standards for experienced teachers have been used to guide the work of the Interstate New Teacher Assessment and Support Consortium (INTASC).

[INTASC is] a consortium of 33 states working together on “National Board-compatible” licensing standards and assessments for beginning teachers both before they enter teaching and during their first two years on the job. This effort, in time, has informed the work of the National Council for Accreditation of Teacher Education (NCATE) which has recently incorporated the performance standards developed by INTASC for judging preservice teacher education programs (Darling-Hammond, 2000a, p. 10)

Research on the effects of NBPTS and INTASC testing programs suggests that the process of attempting certification has had a significant effect on the work of the teachers involved. Participants find the licensing or certification process challenges and stimulates their practice in a very productive way.

Incentives

All of this leads to the thorny area of recertification, performance-based compensation and the like. Certainly individual merit pay, career ladders and similar schemes have failed miserably. Odden (1996) cites research from a wide variety of American sources describing the unsuccessful efforts throughout the twentieth century to implement these mechanisms. He concludes that such attempts, designed for manufacturing industries, were inappropriate for a system which does not produce discrete products. He recommends that a new system of rewards and career paths be designed to meet the needs of the education system as it exists today.

We believe that the emerging evidence points to building a system of standards-based assessment for beginning teachers as well as standards of practice to guide continuous learning throughout the career. Forms of

teacher compensation would be linked to the scheme. For example, beginning teachers would be awarded their license to teach; threshold teachers should receive (as in the British plan, and in some jurisdictions, for the NBPTS system) an increase in salary; more experienced teachers could receive professional development monies, stipends and release time for mentoring and other leadership roles, and so on. Even performance pay for school improvement could be considered, if carefully developed, and indeed is in place in some jurisdictions; see, for example, Urbanski and Erskine, 2000, and Odden, 2000.

In this same vein, Odden (2000) lays out a framework for teacher compensation focusing on 'tools for assessing the knowledge and skills' of 1) beginning teachers, 2) mid-career teachers, and 3) experienced teachers with corresponding forms of compensation.

The whole area of assessing teachers will receive intensive attention (and action) and will remain contentious. The Ontario government recently asked the Ontario College of Teachers (OCT) to provide advice on how to implement a program of teacher testing which is cost effective within the following parameters:

regular assessment of teachers' knowledge and skills;

methodologies which include both written and other assessment techniques;

a link to recertification;

remediation for those who fail assessment;

decertification as a consequence if remediation is unsuccessful.
(transmittal letter from the Minister of Education to the Chair of OCT, November 10, 1999)

The tone of the Minister's request notwithstanding, OCT just released a 92-page 'consultation paper' for discussion with the wider professional and lay public with a response date to the Minister targeted for April.

More broadly, the good news is that many jurisdictions are working on the problem, attempting to take into account what each other is learning. Our report as a whole provides a perspective and set of promising lines of development for the entire career of teaching.

The Role of the Principal

We have not taken up in any detail the role of the principal. We do know that individual principals are often the key agents of school success, that there is little direct preparation for the role or systematic professional development on the job, and that there is no research evidence that links particular professional development to success on the job. It seems obvious, however, that systems parallel to teacher development must be developed for school leaders. In other words, standards for school principals and related assessment and development should be pursued. In the U.S., there is such a system being developed. The Interstate Leaders Licensure Consortium (ISLLC) has established a comprehensive set of standards for principals, and roughly 200 indicators that help define those standards. Their six standards are as follows (Murphy, Yff and Shipman, in press):

1. The school administrator is an educational leader who promotes the success of all students by facilitating the development, articulation, implementation, and stewardship of a vision of learning that is shared and supported by the school community;
2. A school administrator is an educational leader who promotes the success of all students by advocating, nurturing, and sustaining a

school culture and instructional program conducive to student learning and staff professional growth;

3. A school administrator is an educational leader who promotes the success of all students by ensuring management of the organization, operations, and resources for a safe, efficient and effective learning environment;
4. A school administrator is an educational leader who promotes the success of all students by collaborating with families and community members, responding to diverse community interests and needs, and mobilizing community resources;
5. A school administrator is an educational leader who promotes the success of all students by acting with integrity, fairness and in an ethical manner;
6. A school administrator is an educational leader who promotes the success of all students by understanding, responding to, and influencing the larger political, social, economic, legal and cultural context.

The Consortium has linked these standards to professional development and training, licensure, and assessment for school leaders. So far, this program has been adopted by 16 states, either in full, or in part, and it is under consideration in another 18 states. There is no evidence yet of the effects of this initiative, but a program of this rigor shows promise for the future.

More recently, as we have mentioned, the newly established National College for School Leadership in Britain should add considerably to the enterprise of leadership standards and developmental learning.

To conclude this section:

Teacher preparation programs should be accredited, incorporating standards-based components and basic skills knowledge.

A scheme of performance-based assessment of beginning teachers such as INTASC (which includes internships, induction and mentoring) should be put into place.

Similarly, a threshold (e.g., after 7 years) system, and a system of continuous professional development should be established; compensation should be provided to those who meet these standards.

The matter of mandatory re-certification should be pursued, perhaps in the form of a framework of standards-based assessment for all constituency teachers.

New systems concerning the preparation and continuous development of school leaders should be created and put in place.

All of this represents a complex set of issues. Therefore, the lines of development should be pursued while learning from each other; i.e., from the lessons learned in other jurisdictions moving on these fronts; and research and monitoring of one's own efforts should be built into any new initiatives which are being implemented.

We are aware of considerable research being done at present in the areas of standards, assessment and incentives. There appears to be sufficient research in existence or in progress to inform us about what works and what doesn't. What seems most productive at this stage is the development of new models of implementation of assessment systems. The NBPTS and INTASC models both capture approaches which seem appropriate, given our understanding of the issues. Similar models might be developed with the New Zealand context in mind, applying similar principles of design.

Such programs need to be monitored carefully, and adjusted periodically according to the results of program evaluations. A program of design, implementation and evaluation would be a strong contribution, both to a national education system, and to international understanding of assessment programs.

The Learning Profession

The Learning Profession consists of a series of layers of learning communities. In our own developmental work and in our review of the school improvement research, we have concluded that you can turn around an elementary school (from low to good performance in terms of student achievement) in about three years; for high schools it is five years (Fullan, 2000). There are three problems with this observation. First, given the sense of urgency the timeline is too long. The question is whether these rates can be halved with more intensive use of our knowledge about change. The experience in Britain with the National Literacy and National Numeracy strategies, and with “failing schools,” indicates that these rates of improvement can be accelerated with intensive efforts (see Gray, 1999).

Second, the number of cases of turnaround is in the minority. The concern now is how to go to scale with large numbers of schools, not just a few. Third, and more revealing, while it takes a lot of work to turn around a school in the three to five year period, the gains can be lost overnight if a few key people leave. The reason for this is that the wider *infrastructure* is not geared to fostering continuous improvement, and may unwittingly be part of the problem if it contributes to overload and fragmentation.

Our report is about strengthening the infrastructure. We can now summarize these issues, adding aspects and roles in the structure which we have not yet talked about. There are four main conclusions:

1. Establish a comprehensive system including all components we have reviewed in this report, in order to recruit, train, support and retain a high quality teaching force, including effective teacher leaders and principals;
2. Develop schools as learning communities or collaborative cultures;

3. Develop standards and corresponding professional development for school principals;
4. Revise and redesign the roles in the state infrastructure in order to establish aligned pressure and support for generating, maintaining and enhancing a quality teaching profession. For example, General Teaching Councils or Colleges of Teachers would oversee certification and continuous professional learning requirements and corresponding opportunities for development.

The first of these four is self-evident from our previous sections. We will elaborate on the remaining three.

Schools as Learning Communities

We have not talked much about the schools within which teachers will work. While policies are established to develop the teaching force, we must also improve schools as learning communities or collaborative cultures. We and others have written that collaborative schools (or the more popular phrase these days, ‘professional learning communities’) are essential for success (Fullan and Hargreaves, 1992). The study of school restructuring by Newmann and Wehlage (1995) and their colleagues Louis and Kruse (1995) provides the most explicit evidence on the relationship between professional community and student performance. Using standardized achievement tests and more ‘authentic’ performance-based measures of learning, these researchers found that some schools did much better. They trace the reasons for this better performance to whether or not the school had a ‘high professional community’.

In essence, their argument about the internal workings of successful schools is that professional communities make the difference because, in their words:

Teachers pursue a clear purpose for all students' learning;

Teachers engage in collaborative activity to achieve the purpose;

Teachers take collaborative responsibility for student learning ...

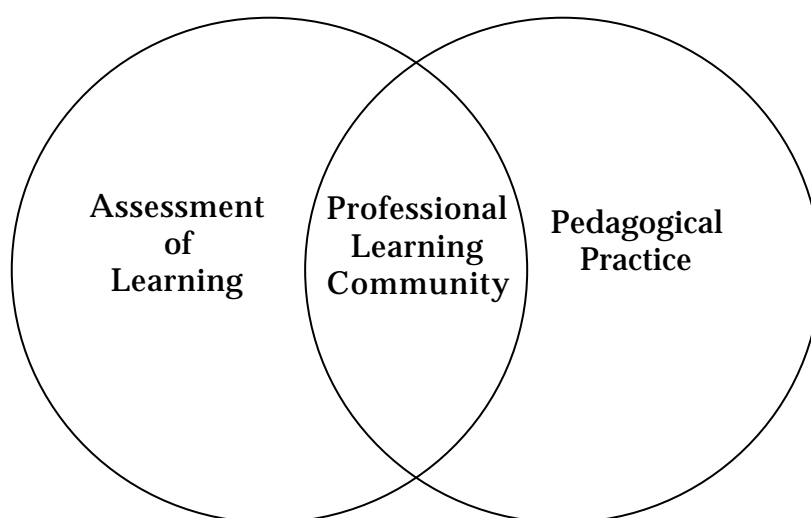
[And]

Schoolwide teacher professional community affected the level of classroom authentic pedagogy, which in turn affected student performance;

Schoolwide teacher professional community affected the level of social support for student learning, which in turn affected student performance. (Newmann and Wehlage, 1995, pp. 30, 32)

In one sense, Newmann and Wehlage and Louis and Kruse are the first to uncover 'the black box' of collaborative schools, which we have depicted in Figure 3.

Figure 3: The nature of professional learning communities (Adapted from Newmann and Wehlage, 1995, and Louis and Kruse, 1995).



What happens in these schools is that teachers as a group and as subgroups examine together how well students are doing: i.e., they study student work and assessment data, they relate this to how they are teaching (i.e., to instructional practice), and they make continuous refinements individually and with each other (i.e., as a professional community). By contrast, in individualistic or balkanized cultures, teacher either leave each other alone or are at loggerheads — disagreeing without any inclination or process to solve differences.

In a similar vein, David Hargreaves (1999) recommends four strategies for developing ‘knowledge-creating schools’ which focus on training and supporting teachers to enable them to carry out school-based research and dissemination of professional knowledge to improve practice.

We know then, what schools as learning communities look like, but it is much more difficult to figure out the pathways in order to produce more schools with these characteristics. Certainly, if preservice programs, induction programs, threshold assessments and continuous learning frameworks are in place, we will gain on the problem through producing and retaining teachers who are committed and skilled at collaboration. Recall the fifth of the five standards from the National Board in the U.S.:

5. Teachers are members of learning communities

National-Board certified teachers contribute to the effectiveness of the school by working collaboratively with other professionals on instructional policy, curriculum development and staff development. They can evaluate school progress and the allocation of school resources in light of their understanding of state and local educational objectives. They are knowledgeable about specialized school and communities resources that can be engaged for their

students' benefit, and are skilled at employing such resources as needed. Accomplished teachers find ways to work collaboratively and creatively with parents, engaging their productively in the work of the school (NBPTS, n.d.).

This direction is reinforced in the recent analysis in *The Teaching Gap* (Stigler and Hiebert, 1999). Examining videotapes of teachers at work in Japan, the U.S. and Germany, Stigler and Hiebert found striking differences between teachers in Japan, and teachers in the other two countries:

Participation in school-based professional development groups is considered part of the teacher's job in Japan. These groups play a dual role: not only do they provide a context in which teachers are mentored and trained, they also provide a laboratory for the development and testing of new teaching techniques (Stigler and Hiebert, 1999:110)

In Japan, the concept of 'Lesson Study' is used to focus on improvement. It is based, say Stigler and Hiebert on the following components:

- A long term continuous improvement model;
- A constant focus on student learning;
- The direct improvement of teaching in context;
- It is collaborative.

Teachers see themselves as contributing to the development of knowledge about teaching as well as to their own professional development (Stigler and Hiebert, 1999, pp. 121-125).

To do this we must restructure schools as places where teachers can learn, which is not now the case. Odden (1999 and 2000) has formulated models

as to how this can be done using a combination of reallocating existing resources and adding new resources. As Stigler and Hiebert conclude:

To do more than improve teaching in their own classrooms, to raise the standard of good teaching within the profession — this demands that teachers work together, sharing what they learn in their classrooms to help one another learn even more.

Principals as Leaders

With respect to our third conclusion, one would expect that school principals could be key to developing and maintaining school learning communities. Indeed, there is evidence that schools which are succeeding against the odds are led by very effective principals (see Bryk, Sebring, Kerbow, Rollow and Easton, 1998; and Elmore and Burney, 1999). We do not have evidence, however, that particular policies, training and credentials have been major factors in high performing principals. This remains an unfinished agenda. What is needed is a similar set of strategies for principals as we have outlined for teachers. That is, standards for the school principalship (which have now been developed) need to be put in place, along with learning opportunities to meet the standards including on the job mentoring for beginning principals and the continuous development of principals on the job. Just as teaching can be a lonely profession, the principalship can be lonelier if learning is not built-in. In this respect, the newly founded National College of School Leadership in Britain should be a valuable resource. Similarly, school districts and other regional support agencies can play a major role in identifying nurturing and otherwise developing school principals (for a particularly good LEA example, see Elmore and Burney's (1999) case study of School District #2 in New York City).

Redesign the Infrastructure

Finally, the roles of the large infrastructure in the state must be revised, revamped, clarified and developed in line with the directions set out in this report. This includes the roles of local education authorities, regional support agencies, higher education institutions, and state education entities (Ministry of Education and other state bodies). The goal is to build a coordinated infrastructure capable of integrating pressure and support in the service of developing learning communities.

While much of this collaborative work happens within schools, recent efforts in educational change have been trying to extend the professional learning community beyond schools into entire systems. The research is still preliminary, but the logic appears sound: if we can extend the work of a number of effective learning communities across an entire system, we will leverage the investment in time and resources, and extend the impact of the investment to a greater number of students.

A number of systems are developing professional networks and partnerships to promote collaboration for educators. They are organized around teaching methodology, subject matter, or school improvement initiatives, and involve face-to-face meetings, electronic dialogue or conferences, or newsletters. Lieberman and Mclaughlin (1992) identified four common features of professional networks. They:

- have a clear focus and target a specific component of the community;
- offer a variety of activities, providing choice;
- create a discourse community of 'critical friends' for reflection and debate, and;
- contribute to the development of leadership skills.

School-university partnerships — such as a professional development school — can create new and more powerful kinds of knowledge about teaching and schooling (Darling-Hammond and McLaughlin, 1995). Similar experiences were reported by members of the Innovative Links Project of the National Schools Network in Australia, in which participants built relationships with educators at universities and schools across the country. Swanson (1995) reviewed three school-university partnerships: the Benedum project at West Virginia University, the Maine Partnerships, and the Learning Consortium at the University of Toronto.

In conclusion, huge investments have and will continue to be wasted if the quality of teaching is not addressed. Reducing class size, producing curriculum, creating charter schools, adding new technologies, and even adding newly certified teachers by themselves will amount to little if what teachers do and how they can get continuously better at what they do is not at the core of policy developments. It is for this reason that Stigler and Hiebert (1999, p. 172) call professionalizing teaching “a lasting solution.” The problem is urgent, the ideas are becoming more solid and robust, investments and new developments are underway in several countries. There is much to do and much to learn. The next five to ten years is critical with enormous opportunities and challenges facing us.

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