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Building Teacher Quality (Conference Proceedings)

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2003

Building Teacher Quality

What does the research tell us?

Research Conference 2003

Proceedings



19-21 October 2003

Carlton Crest Hotel, Melbourne



Building Teacher Quality

Research Conference 2003

Proceedings

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Acknowledgments

Research Conference 2003 Planning Committee

Professor Geoff Masters
CEO, ACER, Conference Convenor

Dr Lawrence Ingvarson
Research Director, Teaching and Learning Research Program,
ACER

Ms Marion Meiers
Senior Research Fellow, ACER, Conference Coordinator

Ms Kerry-Anne Hoad
Manager, Centre for Professional Learning, ACER

Conference Management

Centre for Professional Learning, ACER
Ms Kerry-Anne Hoad
Ms Margaret Taylor

Foreword

ACER is very pleased to be hosting our eighth national Research Conference. The research conferences provide significant opportunities at the national level for reviewing current research-based knowledge in key areas of educational policy and practice.


Research Conference 2003 brings together key researchers, policy makers and practitioners from a broad range of educational contexts from around Australia and overseas. The conference aims to enhance understanding of the significance of building teacher quality and strengthening the provision of learning opportunities for students, and identifying ways in which this work can best be informed by research.

The conference will provide a 'state-of-the-art' review of:

- research on improving teacher education, teacher quality and recruitment;
- evidence of the effects of initial teacher education, induction and teacher professional development on teacher quality;
- the major directions in which Australian policy and practice on teacher quality are heading;
- how Australian developments compare with major trends overseas;
- what research tells us about policy-useful understandings of issues of supply, remuneration and funding; and
- what research tells us about the integral role of pedagogy in teacher quality

It is interesting to note that participants in this conference have a diversity of backgrounds in education. One of the key lessons from research on teacher quality is that the issues are too complex and wide-ranging to be tackled by educators working in isolation. We hope that one of the main outcomes of the conference will be the sharing of knowledge about efforts to build teacher quality, and the research required to support work at the school, state and national levels.

Discussion of issues relating to teacher quality is timely given the growing recognition of the need for a national framework to support the professionalism of teaching, increasing national interest in professional standards for beginning teachers and for accomplished teachers, and national efforts to raise the status of teaching. The interim report, *Attracting and Retaining Teachers of Science, Technology and Mathematics*, from the Committee for the Review of Teaching and Teacher Education (February 2003), highlights the complexity of establishing and maintaining an adequate supply of quality teachers generally. The announcement in July 2003 by the Commonwealth Minister for Education and Science, Dr Brendan Nelson, that the Commonwealth Government will provide an initial \$10 million to establish a National Institute for Quality Teaching and School Leadership commencing in 2004, clearly reflects the priority being given to quality teaching.



ACER research, with its focus on *improving learning* for all young people, has made strong links with work on teacher quality across many research programs, recognising that teacher quality is the single most important influence on improving learning opportunities for students.

I am especially pleased that *Research Conference 2003* includes a number of high quality plenary speakers and concurrent session presenters from around Australia and overseas. These speakers have invested considerable time and effort in developing informative and challenging presentations, and their efforts are greatly appreciated.

We are sure that the papers and discussions from this Conference will make a major contribution to the international literature and debate on building teacher quality.

(Prof) Geoff N Masters
Chief Executive Officer, ACER



Geoff N Masters
CEO



Summaries of conference papers

1. Plenary papers

This section of the conference proceedings includes summaries of most conference papers. It should be noted that these papers are summaries, and may not include all the content in the full version of the paper as presented at the conference.

Promoting teacher quality in England: the role of the Teacher Training Agency

Ralph Tabberer

Chief Executive Officer, Teacher Training Agency, England

In the past ten years, international comparisons of pupil performance have brought new energy to comparative education. OECD, IEA and other studies beg us to compare and contrast the ways that different national, and state, educational systems work. If researchers do not take up this agenda, all can be sure that politicians and policy-makers will.

The more that each country grows to understand another's structures and institutions, the more that all are brought to recognise the highly complex nature of educational systems. My organisation, the Teacher Training Agency, is in its tenth year and remains a unique body, a national arm of government charged with working at the gateway to the profession. The Agency has two prime responsibilities which are rarely combined.

First, it competes in the graduate labour market to *recruit* prospective teachers into initial teacher training (ITT). The teaching profession needs a massive proportion, well over ten per cent, of that labour market – more than 30 000 new entrants a year in England.

Second, it ensures that the *quality* of ITT is the best it can be. Importantly, the TTA has the powers to buy ITT provision and therefore to allocate training places to universities, schools and other bodies according to their quality. In most countries, of course, the two responsibilities of recruitment and ensuring teacher quality are usually dispersed and devolved.

It is not for me to suggest that the TTA model will readily apply elsewhere. Comparative education should never allow for such a simple conclusion. But I do want to argue that in England, by combining such significant responsibilities in a single body, at the gateway to the profession, we have made some significant advances, not just in results, but in the ways we think and act.

The case of the TTA, I believe, makes important points about (a) the value of having powers and policy levers that work, (b) the value of combining evidence and policy concerned with teacher quantity as well as quality, and (c) the value of looking out from the education service as well as within. The evidence from England indicates at the very least that marked improvements are available to all of us concerned with teacher education, teacher quality and teacher numbers.

Improving quality

In 1994, TTA was given its defining powers to fund and allocate places for all initial teacher training in England, *according to quality*. The establishment of such an agency was a controversial step.

It meant that the funds needed for a certain level of ITT would be calculated year by year – around a fixed unit of resource, with trainee numbers based on a manpower planning model run by the Ministry (now the Department for Education and Skills) which identifies needs for the teaching profession that take into account existing teacher numbers, pupil numbers and projections, teacher-pupil ratios, demographic trends (for example, birth rate, teacher age distribution), policy requirements and other factors. Since 1994, the funds have been top-sliced from the higher education spend and assigned to TTA.

ITT providers have been formally accredited, most of them the conventional providers based in higher education, but a few (less than five per cent of the market) in the form of new school consortia. At first, two models of provision dominated: the undergraduate course (three or four years) leading to a Bachelors degree and the postgraduate course (one year) usually leading to a Post Graduate Certificate in Education. The school consortia (School Centred Initial Teacher Training, or SCITTs) have only offered one-year postgraduate courses.

Clear quality standards and course requirements were set out in regulations and have been updated over time. They have addressed the standards that trainees should achieve and the entry requirements and training requirements for all courses. A system was established for inspecting ITT quality, deploying Her Majesty's Inspectors from the Office for Standards in Education (OfSTED) on a regular inspection cycle, and the grades that each provider receives have since been published annually, affecting the numbers of places that each provider is subsequently allocated. High quality providers have received more places. Providers falling short of expectations have had numbers cut and a few, where they could not turn round unsatisfactory performance, have been de-accredited.

This has been the framework for ITT reform and, certainly, on the basis of stronger sanctions and incentives, it built through the 1990s a better focused and more accountable sector. It is a long way from the

report by Her Majesty's Inspectors which, in 1988, had noted that 'plans to achieve coherence in the work of tutors, teachers and students are still regularly frustrated...by the autonomy which tutors traditionally enjoy within the universities'.

Measurable improvements followed. Inspection data indicate that, over the last five years, there have been annual increases in the proportions of trainees placed with providers graded A (very good) and B (good) by OfSTED. The recent trend has been:

Year	Total inspected places	High quality places	% of Total inspected places
1999/00	27393	19144	69.9
2000/01	28517	20132	70.6
2001/02	28297	21054	74.4
2002/03	30026	24199	80.6
2003/04	32265	26093	80.9

An even better indicator has been the performance of newly qualified teachers (NQTs) in their first year of teaching. In England, it is possible to draw this information from OfSTED's school inspection data, within which there are records of classroom observations both for new and experienced teachers. Inspection records now show that in 2001/02, 93 per cent of secondary NQTs were judged to have given satisfactory or better lessons, compared with 95 per cent of experienced teachers. In the same year, 95 per cent of primary NQTs were judged satisfactory or better compared with 97 per cent of experienced teachers. In 2003, Her Majesty's Chief Inspector described the new teacher cohort as 'the best ever'.

For any education system, this would be a significant advantage, injecting better quality year on year, presumably with new teachers challenging their peers to teach as well as they can, and challenging their managers to organise and lead them better.

The TTA experience is but one case study. It happens to support theories of education reform that emphasise the importance of system changes which, through the use of powers and policy levers: increase accountability; establish clear standards; ensure quality is objectively inspected; and ensure that success is rewarded and failure confronted.

But it is equally important to understand that while new frameworks may instigate change, they do not necessarily make improvements happen.

I believe that there have been three essential drivers, improving practice within the undergraduate and postgraduate courses:

- trainees spend more time in schools – the standards and requirements have moved England towards an 'internship' model for ITT, with a marked increase in the proportion of time spent by trainees in

schools (on the one-year postgraduate course for secondary schools, for example, time in school accounts for at least 24 of the 36 weeks);

- trainees are better organised and learn the method of teaching – the standards and requirements have greatly increased the focus on 'practical theory', that is the application in schools by new teachers of a more rigorous planning, preparation, teaching and assessment method designed to use what we know from the disciplines that illuminate the classroom – philosophy, psychology, sociology and pedagogy; and
- trainees are more focused on subject knowledge – the standards and requirements have underlined the importance of subjects and sought to strengthen the capacity of trainees to carry their subject expertise and enthusiasm to the child.

Crucially, this is not to argue that schools do ITT well and higher education does not. ITT quality in England has been improved by strengthening the partnership between all sides involved in training and not by setting one side against another. 'Practical theory' needs theory as well as application; in our experience it needs higher education as well as schools.

Improving numbers

The characteristics of system reform (accountability, standards, quality assurance or inspection, target measures to deal with success and failure) which underpin TTA's working methods are shared by system-wide, school reform measures undertaken in parts of Australia, USA, England and elsewhere. Yet, for the educational policy-maker, let alone the researcher, this leaves many crucial questions unanswered:

- At what cost – financial and otherwise – are such quality gains achieved?
- If more accountability has worked, how much more is needed?
- If establishing formal standards has helped, what form should they take and exactly how should they be assessed?
- If inspection has worked, how much is needed and would alternatives work as well?
- If incentives and sanctions have made a difference, how many are needed and in what balance and form?

The answers to these questions are not so straightforward, and for two reasons.

First, the TTA has changed the character and nature of its regime significantly in the course of its first ten years. The approach used in the first major reform period, up to 2000, was both detailed and robust. The standards were set out in substantial detail, with

expectations numbered in the hundreds; in their fullest form in 1998, the standards and requirements filled 138 pages of a government Circular. At first, inspections were both frequent and extensive. Swift action was taken to deal with instances where providers were perceived to be non-compliant with the standards, or simply of very poor quality.

Since 2003, the regime has become looser. The standards have been reduced to 42, their publication reduced to fewer than 20 pages. As an aside, they have converged markedly with the standards adopted by other nations and states. Inspection loads have been lightened. Much more action is focused not on compliance but on the quick recovery of those falling below the quality expected.

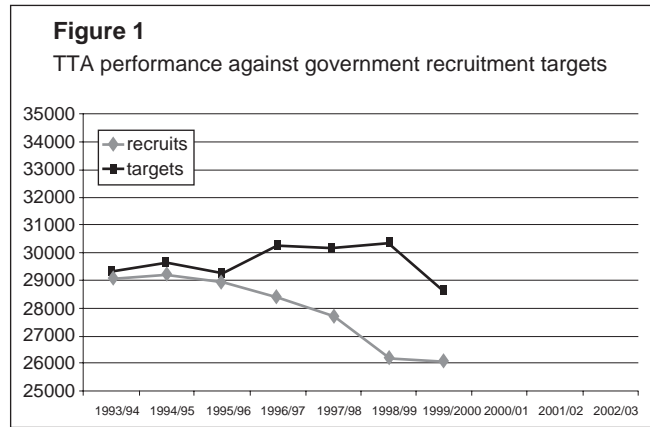
Second, it has become apparent that it is unwise to address matters of quality without also tackling quantity.

England shares with much of the rest of the world a problem of teacher supply. Only those economies in which graduate opportunities are relatively limited tend to be exempt from difficulties in sustaining teacher numbers.

In particular, England suffers from the problem that, as more employers in a mature economy begin to seek higher rather than intermediate qualifications from their work force, and especially as more graduate opportunities become open to women, teaching loses competitive edge as a career. Additionally, since teaching is such a major purchaser in the graduate labour market, the government cannot simply really buy its way out of trouble by increasing teacher salaries. Others will be able to compete more keenly for smaller numbers to equip their businesses and services, and the effect is soon likely to become inflationary.

The value of TTA holding responsibility for recruitment to ITT as well as for training quality should not, in my view, be underestimated. During the 1990s, the TTA had to struggle with the growing tension between using robust standards measures to realise quality while the failure to recruit adequate numbers began to undermine any gains. By 2000, it needed to find a new balance between the battle for quality and the war on numbers.

The track of TTA's performance in attracting recruits to ITT demonstrates just how powerfully teaching numbers were affected by wider economic forces in the UK economy. Between 1990 and 1999, teacher recruitment declined, especially to teach in secondary schools (see Figure 1).

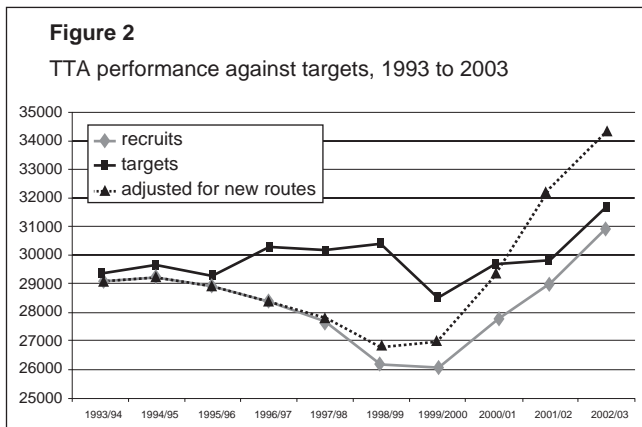


The fall in teacher recruitment performance largely reflected the boom in the UK economy, and this relationship is historical. Since the recruitment targets were generated by the government's manpower planning model which predicted school demand, the problems generated soon became serious. Over a short period of time, the most challenging issue in teacher quality – and the biggest risk to government efforts to raise educational standards *in schools* – was simply the availability of teacher numbers.

It is almost a first law of school reform: do not attempt to raise standards except in a recession. Only then are there likely to be sufficient teacher numbers to fuel the improvement measures. And the areas where gains in initial teacher training quality are worst affected by the absence of available teachers, are usually in urban areas where living costs are higher and school circumstances often more demanding – that is, where high teaching quality are most needed. Teacher numbers contribute significantly to the second law of school reform: most improvement measures that raise standards also tend to widen the gap between top and bottom.

After coming to terms with the need to address quantity as well as quality, the turnaround in recruitment performance has been striking. Figure 2 presents improvements in teacher recruitment since 1999 and they are improvements which were first gained *against the economic cycle*.

There are in fact two kinds of improvement displayed in Figure 2. First, there is the turnaround since 1999 in recruitment to conventional undergraduate and postgraduate courses. This was achieved, at first, by introducing training bursaries for postgraduate courses. These relatively small bursaries removed the financial burden of training for an additional year and they have worked in increasing recruitment performance by five to eight per cent a year, for the last three years (a further rise is anticipated in 2003/04).



Second, there is the innovative rise, emerging from the introduction of new routes into teaching.

Since 1999, a succession of new routes into teaching have been introduced and/or expanded. The most significant are the employment-based routes, notably the Graduate Teacher Programme (GTP) which pays trainees while they undertake on-the-job training attached to a school. Many GTP places are overseen by higher education providers working with schools. More than 3000 places were available in 2002/03 and plans are in place to expand GTP to about 6000 places in the next three years.

But GTP is not the sole innovative route. The TTA has experimented with a number of new routes, including a 'fast track' route for the ambitious, a progression route (the Registered Teacher Programme) designed largely for non-graduate teaching assistants and support staff and, recently, 'Teach First', an adapted version of 'Teach for America' which prepares very able graduates for joint training as teachers and business leaders of the future.

Looking out from the education service

An important lesson for TTA has been to look outside the profession in order to achieve improvements within it.

The TTA has increasingly become as adept at marketing as at educational reform. Only by studying the graduate labour market, can a profession compete within it. And it is not possible to compete without coming to terms with a number of trends. Notably, career choice for the individual working in the modern economy is very different now from 20 years ago. Graduates have become far more sophisticated in their career knowledge and decision-making.

Different graduates want different things; some want the steady career option that teaching has offered in the past. Others want faster progress, more flexible working arrangements, or better work-life balance, or much greater occupational mobility ... or something else.

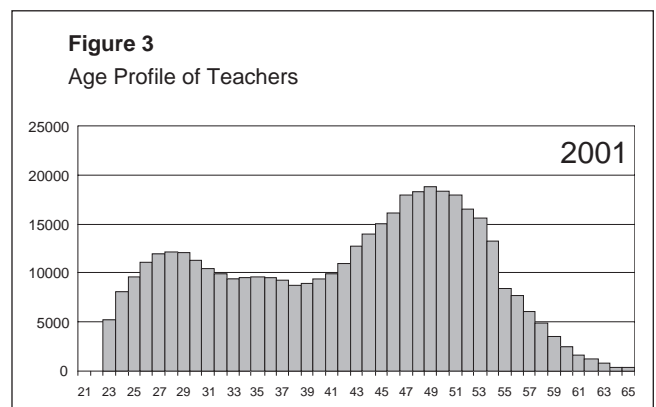
There is no point in wishing for the world to be one way, when the marketing evidence tells you that for many people, it is another. There is no point wringing hands wishing that the vocational drive to teach for life could be rediscovered, when young people have come to learn a new approach to vocation – that it may last five to ten years, rather than a lifetime. It is better to find the advantage in the new, and that is what TTA has tried to do by targeting more mature career changers.

Marketing methods have underpinned the TTA's approach to expanding new routes into teaching. Year on year, professional recruitment, advertising and research programmes are equipping the teaching profession to keep with other occupations. Year on year, data sets are being built which will help TTA understand deeper relationships between those who are attracted to enquire about teaching and those who eventually enter the profession and, better still, those most likely to stay.

And like an expert marketing organisation, TTA tests out new routes – that is, new products in the labour market – at first in small numbers, prior to taking ideas that work fully to market and to scale.

Using marketing techniques, in England, TTA has helped the government to establish teaching rapidly as the second-career of choice in the economy: more than 12 000 people each year, aged 30 plus, leave jobs they find less attractive, in order to enter the teaching profession. Importantly, recruitment has risen across the board and even in the traditional shortage, secondary subjects – mathematics, science, design and technology, modern languages – the gap between schools' needs and teacher numbers is now closing.

It is an added bonus that by attracting career changers, TTA may also help to address the imbalance in the age distribution of the teaching work force in England (see Figure 3).



Policy ramifications

Aside from lessons about improving training quality and about increasing teacher numbers, the TTA experience of spending more time looking out from the profession has brought fresh insights and helped strengthen new initiatives. In 2002, the TTA encouraged the government to extend its remit, to create standards and training for a new 'associate professional' cadre in education: what are currently called Higher Level Teaching Assistants.

It has long been an anomaly that the teaching profession encourages research, investment and debate about initial training and continuous professional development for itself, far more than for the educational work force as a whole. It takes only a moment looking outside the profession, into business and health for example, to find whole industries investing in diversifying its work force and rebuilding their training and progression routes accordingly.

The TTA believes that the next waves of school reform will need more than a strong professional cadre of teachers. They will need the combined efforts of a well trained, diverse work force – in which teachers are free to concentrate on those areas where they can add value best, and others can adopt a range of support roles in teaching and learning. Sometimes, the education service needs to look outside more keenly, in order to recognise how to pursue the improvements it seeks within.

Twelve years with the National Board for Professional Teaching Standards: Reflections of a psychometrician

Lloyd Bond

Senior Scholar, Carnegie Foundation for the Advancement of Teaching, USA

For 12 years, from 1990 to 2002, I worked closely with the National Board for Professional Teaching Standards (NBPTS)¹, first as co-director (with the late Richard M. Jaeger) of the National Board's Technical Analysis Group (TAG), and for the past five years as Senior Advisor for Assessment. In both capacities I had the enviable opportunity to observe and participate in an enormously challenging and very rewarding experience. In this paper, I will highlight many of the psychometric challenges that had to be overcome to ensure that the National Board's system of advanced teacher certification met the highest technical standards of the measurement community. Ensuring the technical measurement quality of this high-stakes assessment has consumed almost half of my professional life as a psychometrician, so I may be forgiven a modest tip of the hat in rejoicing over the high regard in which the National Board's assessment is held by the measurement profession.

The history, governance, and assessment architecture of NBPTS is readily available on the Internet at www.nbpts.org, so I will not devote much time to a review of these. I will only note here that one had to be there to appreciate the concern with which the USA greeted the landmark report, *A Nation at Risk: The Imperative for Educational Reform* (The President's Commission on Excellence in Education, 1983), which concluded in no uncertain terms that the nation was at risk of catastrophic collapse, both economic and technological, if it did not radically alter its educational system. A follow-up report, *A Nation Prepared: Teachers for the 21st Century* (the Carnegie Forum on Education and the Economy's Task Force on Teaching as a Profession, 1986), called for, among other things, the formation of a National Board for Professional Teaching Standards that would set high and rigorous standards for the nation's teachers and would certify teachers who met the standards. Hence, the National Board, established in 1987.

To be sure, the National Board's charge was a daunting one. Establishing a set of standards that would garner support from the nation's three million teachers, the public officials, the teacher education community, the assessment profession and the public at large was difficult enough. But creating instantiations of those standards in the form of assessments that conform, for

example, to the *Standards for Educational and Psychological Testing* (1999)² was even more daunting.

My remarks would consume hours if I attempted to detail all of the psychometric challenges the Board faced. I will therefore limit my comments to those issues that were the most vexing and presented the most technically challenging problems. I note in passing that, because of the sheer scale of the task as well as its high-stakes consequences, none of the psychometric issues the Board faced were trivial. But some were clearly more intractable than others. The most difficult challenges arose from issues related to scoring. Indeed, some have charged that the most intractable problem the Board faced (and continues to face) – that of adverse impact by ethnic groups, especially African Americans – has its root solution in the scoring process.

The paper will concentrate on five of the many challenges that the Board faced and how these were handled:

- (1) the relationship and communication between the committees that created the standards for each certificate and committees that actually developed the assessments;
- (2) the scoring model to be used (compensatory vs. conjunctive);
- (3) selection of benchmarks;
- (4) assessor selection and training;
- (5) adverse impact.

The relationship and communication between the committees that created the standards for each certificate and committees that actually developed the assessments.

The Board initially had the notion, misguided in my opinion, that the Standards Committees and Assessment Development Committees should be separate, non-overlapping panels with minimal if any communication between them. The notion was that the Standards document, while necessarily visionary, should be of such clarity and focus that no communication between the Standards Committees

¹ NBPTS is an independent, nonprofit, nonpartisan organisation (in the USA) governed by a board of directors, the majority of whom are classroom teachers. Other members include school administrators, school board leaders, governors and state legislators, higher education officials, teacher union leaders and business and community leaders.

² Developed jointly by the American Educational Research Association (AERA), the American Psychological Association (APA) and the National Council on Measurement in Education (NCME). These standards were much revised from those developed in 1985.

and the Assessment Development Committees was necessary. This was clearly a case of over-generalising the principle of ‘independence’ and ‘independent observations’. Or it may have been a misapplication of a validity experiment suggested long ago by Lee Cronbach³. He once proposed a validity study for an assessment where two committees, working independently and from the same set of test specifications, developed two separate tests. If the tests were highly similar then that augured well for the validity of the tests and the soundness and clarity of the test specifications.

For reasons outlined in some detail in the paper, the notion that Standards Committees and Assessment Development Committees should work independently is a profoundly misguided one that resulted in several false starts in the early stages of the National Board’s work.

The scoring model to be used (compensatory vs. conjunctive)

Should outstanding performance on one aspect of teaching ‘compensate’ for poor performance on a different aspect of teaching? Are there some components of teaching that are so central that poor performance on them cannot be compensated for with solid performance on other components? In other words, should the assessment of teaching performance adopt a *compensatory* model or a *conjunctive* one? The National Board and its panel of technical advisers struggled mightily with this issue. In my opinion, there are excellent logical and psychometric arguments for either approach. As the paper explains in more detail, an asymmetrical *conjunctive* scoring model (whereby an egregiously poor performance on an important teaching component automatically means non-certification, but an outstanding performance on an important component does not guarantee certification) results in a less reliable test with measurably more false negative decisions. A fully *compensatory* model also has disadvantages discussed in the paper. The National Board’s eventual decision to adopt a compensatory scoring model involved a judicious weighing of numerous competing forces, not all of which were psychometric.

Benchmark selection

A crucial part of any sound performance assessment is the selection of benchmarks, that is, exemplars of the categories on the assessment score scale. If the teacher candidate pool is demographically and ethnically diverse, care must be taken not to reinforce possible stereotypes by systematically (but possibly

inadvertently) choosing candidates from one group as training, calibration and scoring exemplars of higher performances, and members of another ethnic group as exemplars of lower performances. Such systematic selections during training and calibration can powerfully reinforce the effects upon potential assessor biases.

In fact, unwanted ‘systematicities’ of all kinds can creep into the selection of benchmark cases. A certain teaching style (unrelated *per se* to quality teaching) may have inadvertently become associated with higher scores, and vice versa.

Assessor selection and training and Bias and adverse impact

Can a teacher who grew up, went to school, and now teaches in rural Iowa validly assess the teaching performance of a teacher in Harlem, south central Los Angeles, or a barrio in El Paso? Can one of these teachers assess the Iowa teacher fairly and validly? This is one of the central challenges, indeed it may be THE central challenge, both psychometrical and political, that the National Board faced and faces. In as much as I conducted the majority of the National Board’s studies of bias and adverse impact, I feel especially qualified to assert that, not only can teachers from widely disparate backgrounds be trained to validly assess other teachers in their discipline, with an outstanding training protocol they can be trained to do so in exceptional ways. I outline in some detail the many studies conducted so far on the fairness and validity of the Board’s assessment for all US teachers.

³Lee J. Cronbach (1916-2001), an American education professor who made major contributions in the fields of educational psychology and psychological testing during a career that spanned over five decades.



2. Concurrent papers

Building the knowledge base on teachers and teaching: paradoxes, issues, questions and (some) answers

Malcolm Skilbeck

Connell Skilbeck P/L, International Education Consultants; former Deputy Director for Education, OECD

This session, while drawing on recent Australian and international studies of teaching and on supporting research, will be structured by questions, paradoxes, and issues.

I should like to start with a provocative question. Why is it that despite a succession of reports and studies over the past 30 years, we still seem to be struggling to develop national policies for teachers, teaching and the initial and continuing education of teachers? Putting this question slightly differently, Why do we keep returning to the same questions, proffering the same or similar answers? Or, another variant which perhaps takes us closer to a central issue, Why are we not establishing major policy initiatives relating to chronic issues, on the basis of knowledge, understanding and widespread agreements within the education community – a basis of knowledge which is as strong and clear as knowledge can be but is still poorly reflected in many corners of our policy and practice? This set of broad questions provides the context for the more specific ones I shall be raising.

I am struck by the contrast between 30 years of reviews, research, studies, reform proposals and the recurrence of the same questions and concerns that were apparent in the 1970s and perhaps earlier still. While I don't suggest that the explanations we may offer are simple and straightforward, some preliminary discussion could set us off on the right foot for addressing the specific questions I wish to raise. Indeed, it's because the answers, if they are to be adequate, cannot be simple and direct. We should adopt a questioning stance toward the idea that a knowledge base can ever be more than a starting point for an inquiry – a quest not a resolution.

The questions I shall be raising for discussion follow. At the end I have appended some relevant references.

1. Why do Australian students on average perform so well in PISA (and TIMSS) when they are reported to be taught by (a) poorly motivated and often, it is said, rather unimaginative science teachers and/ or (b) by large numbers of inadequately qualified mathematics teachers?
2. In the context of the report of the 2003 report of the national Review of Teaching and Teacher Education with particular reference to science, mathematics and technology, why do we need more specialist, highly trained science and mathematics teachers

and more rewards for them, when teaching 'out of field' *per se* is reported to **not** adversely affect student learning outcomes?

3. How many expert scientists, mathematicians and technologists do we need and are the existing schooling and tertiary education pathways adequate?
4. How do we know whether or not there is a looming shortage of teachers; moreover, how many teachers do we 'need' for 'the school of the future'?
5. Is 'generational change' – one of the central motifs of current discussions about teacher supply and demand – any more than a matter of numbers? Or, how different is the coming generational change from previous generational changes and what might we be doing to prepare for it?

These questions are among those which I have encountered or asked myself throughout this year. They arise out of the data relevant to three consecutive and partly overlapping studies in which, together with Dr Helen Connell, I have been engaged:

- on behalf of DEST, to prepare the Australian Country Background Report for the OECD multi-national project on 'Attracting Developing and Retaining Effective Teachers';
- assistance to the Secretariat in preparing the general report and the recommendations (Action Plan) of the national Review of Teaching and Teacher Education with particular reference to science, mathematics and technology; and
- a recently launched study for the MCEETYA Teacher Quality and Educational Leadership Taskforce on 'The Changing Nature of Society and Related Issues for the Teaching Workforce'.

It is a rare opportunity and a great privilege to be undertaking this succession of studies. As a result, I have had access to a mass of data and interpretative analysis and to many knowledgeable, highly experienced people working in the field. The challenge to produce narratives, explanations, and recommendations in fields of inquiry which are absolutely central to the educational enterprise and to its role in national development is daunting. But it is satisfying to know that so many highly competent educators in Australia today have turned their attention yet again to problems and issues that for too long have remained unresolved. My chosen questions

for this session omit several of them, particularly those relating to teacher education and professional development.

Each of the questions I have identified poses further questions about how we are to read research findings and, in particular, how we can interrelate findings from different, often quite disparate studies, that bear on or help to illuminate important issues of educational policy and practice.

I have referred to these as paradoxes, because, on the face of it, there is a contradiction or an unresolved conflict in the evidence or the interpretations or both. I have referred to them as issues because there are different, perhaps divided views about their meaning and action that may need to be taken. Perhaps it is at least partly because of the paradoxical nature of the evidence and that there are divided views about the meaning of the findings that action is so often left in abeyance. We don't act because we don't know what kind of action might have desired effects, or even what effects we actually desire. Another interpretation may be that certain changes in teacher policy are not supported by the necessary resources because salary and capital costs absorb such a high proportion of the education budget that strategies for quality improvement including teacher education and professional development cannot be adequately funded. Resourcing is of course a major issue, but it is not my subject today.

The five questions I have identified for this session illustrate various kinds of difficulties in establishing and implementing policies thoroughly grounded in data and evidence. Let us take them in turn.

Question 1

Australian students aged 15-16 – perhaps to the surprise of detractors of educational standards – on average performed very well in internationally comparative terms on **most aspects of the** PISA and TIMSS surveys, being ranked for mathematical and scientific literacy among the high performing countries.

Commenting on these results, Lokan and colleagues remarked: 'Considering only the highest performing five per cent of students in each country... no country performed at a statistically higher level' (than Australia). In TIMSS, Australian students overall performed above the international average and often at levels close to the world leaders.

Weaknesses were apparent, for example, and as expected, among Indigenous students and in particular aspects, including the level of interest in science and evidence of repetitious teaching. Of particular concern is the rather long tail indicating a large gap between high and low performers. All of

these weaknesses can be acknowledged, yet the performance has placed Australia high among countries, overall.

It may seem puzzling, therefore, that more or less concurrently with the PISA survey we have research reports strongly critical of the quality of science teaching and of the commitment of science teachers, and suggesting that we have far too few well educated mathematics teachers. The evidence from different sources has been reviewed in the report of the national Review of Teaching and Teacher Education. Perhaps other countries are even worse in these respects than we are – or perhaps our knowledge of what is happening in teaching and learning is inadequately informed by either PISA or the research on teachers – or both. It does seem paradoxical, however, that there should be national concern over the quality of science and mathematics education when PISA and TIMSS results are so positive.

These questions may not be readily answered but they are worth raising since it is not at all clear, taking the findings from their different sources, just what action, what new or different policies, might be needed. It is just this point that the national Review has taken over. In Germany, where poor PISA results caused national consternation, action was immediately stirred: it's much easier, it seems, to act on bad news than on good news – especially where the good news is complicated by other information which appears to contradict it.

PISA and TIMSS results and research reports and statistical data on teachers and teaching are of course not the only sources of information about what students know and can do with their knowledge. They do, however, have implications for teacher educators, system authorities, school principals, subject department heads, classroom teachers, professional associations, those responsible for higher education and professional development – and others. It seems to me incumbent on all of these people to draw upon the different data sources and to shape their action according not to any one source, but as far as practicable taking them all into account. This means a deeper searching, it means getting beneath the finding – and it means continuing inquiry, research and investigation. The report of the national Review should be a stimulus to all of this.

Question 2

The second, related question I have posed raises a different, but no less challenging issue. As I discovered in working for the Secretariat and the Committee responsible for the national Review on Teaching and Teacher Education, very strong views are held by some leading figures in especially in mathematics education about teachers who are

inadequately qualified but nevertheless are teaching mathematics. It seems obvious, at first glance, that mathematics especially in secondary schools should be taught by (academically) well qualified mathematicians. Equally, it seems obvious that primary school teachers who, on the whole, lack the kind of systematic mathematical knowledge that comes from advanced or tertiary level study, should have better qualifications in the subject. As so often, however, what seems to be the case does not appear to hold up quite so well in the face of evidence.

Question 3

My third question also relates, this time quite directly, to the national Review of Teachers and Teacher Education, and to the research report prepared for it by John Ainley and Catherine Underwood of the ACER. As far as I can see, we simply do not know how many specialist teachers of science, mathematics and technology are needed, other than that if the various recommendations that are being widely canvassed were to be adopted, we should need 'rather more' and 'rather better' teachers than we have at present. Three recommendations put to the Review and one item of research data provide the basis:

- (1) specialist science teachers for primary schools;
- (2) more students to study science and mathematics to more advanced levels in upper secondary schooling;
- (3) improvements in the quality of teaching;
- (4) the research shows a decline in enrolment in the core sciences and advanced mathematics over the decade of the nineties, **but** a small overall increase over a 30 year period which has seen a major increase in retention rates.

However, what we do not know is whether more specialist science and mathematics teachers would result in more students studying these subjects and if so whether to advanced levels and whether, as a consequence they would undertake tertiary studies in these subjects and enter careers in them including teaching. To illustrate, in one of the schools visited in the course of the Review, there are high levels of upper secondary participation in sciences and mathematics, but students continued to law and business at university. Also unknown are the effects in different jurisdictions of required subjects for Year 12 (the pattern of declining pre-requisites for university study), changes in student approaches to career preparation, greater choice of Year 12 subjects, especially in the expanding field of school level vocational studies. How many high level scientists does the economy need? Some studies indicate relatively few; but all people need basic scientific/mathematical literacy in a technological and

knowledge society such as ours; a basis on which they can, should they wish to, further build their own knowledge and understanding through a process of lifelong learning. Perhaps our focus should be – in accordance with the approach adopted in PISA – on the concepts of universal scientific, mathematical and technological literacy throughout both primary and secondary schooling, out of which more students will freely choose to undertake advanced studies in these fields.

Question 4

My fourth question raises a chain of uncertainties. Either there will be a shortage of teachers by about 2008 – the favoured year – or there will not. Either the shortage, if it occurs, will be in a specific field or fields, or geographic areas or it will be more general. The consensus, if indeed there is one, suggests that there will be a shortage and that it will be in certain subject fields including science and mathematics. We have to concede that forecasting demand and supply trends is a very inexact art. My question is, What contribution can and might research make to reducing uncertainty? Perhaps if we understood better why so many teachers leave the profession before retirement age we could avert shortages. There are very large numbers of people qualified to teach who are not teaching. But there are also large numbers of lawyers who do not practice the law. Should we be studying teachers in isolation from other professions? A subsidiary question is the extent to which research informed the debates in the 90s, when education system authorities and the deans of education were in considerable disagreement over whether or not a teacher shortage was looming. Also, the idea of a shortage presupposes continuation of current patterns of school organisation. These may be of decreasing relevance in a technological era when new patterns of teaching and learning may be explored, with potential to vary ways of teaching and learning and to vary standard teacher/student ratios. This issue relates also to my fifth and final question.

Question 5

The fifth question brings into play memory, knowledge of the past and their role in research on teachers. We have had large scale movements out of the profession before, when, for example, many female teachers left the profession on marriage. Did this result in a dramatic transformation of the teaching force? If so, it was scarcely noticed at the time. It also requires us to look closely at what is happening as distinct from relying on neatly worded constructs, of which the term 'generational change' is a good example. It is a fair surmise that, over the next decade, a very large – if imprecise – proportion of the

Australian teaching force will retire. I say 'surmise' because a single set of changes in public policy could alter the figures considerably. The retirement surmise depends on continuance of present arrangements which are in effect an incentive to (most) teachers to retire between the ages of 55 and 60. According to Clare (2003) the 54/11 phenomenon is of most relevance to Victoria and the ACT – but within ten years, large numbers of teachers will have reached 65 – the story seems to be less a once-off generational change, but a staggering of these retirements. There are already some indications that early retirement will cease to be encouraged by policy levers and may be actively discouraged. A further consideration is that, as the proportion of mature age entrants to teaching increases, it may not be an attractive option for these teachers to retire at age 50 since unless they have brought with them into teaching good, portable superannuation entitlements, they will not have amassed the necessary number of units to make retirement at 55 attractive.

Educational 'transformation' to replace 'reproduction'?

There is, however, a consideration of a quite different order which could in time seriously upset calculations about so-called generational change and future demand. For a very long time, we have had a rather static view of the teacher, of the teacher's role, of relations between teachers and students and – dare I say it – of student- teacher ratios or, to be more specific, class size.

One of two main reasons that teaching is commonly regarded as a conservative profession and a conservative force is that the in-school **conditions** of teaching have arguably changed relatively little. The other main reason is that teaching has, or so it is claimed, been largely *reproductive* or at least fundamentally uncritical of existing status and power relations in society. But suppose the recent focus by some leading commentators on educational 'transformation' were to displace the 'reproduction' hypothesis, and suppose the forces associated with 'transformation' (knowledge as a fluid, provisional, process) were to materialise in education – such as the widespread adoption in schooling of the full resources of ICT and global networks accessible to teachers and to students, together with the impact of the dynamics of the knowledge society and the knowledge economy.

'Transformation' (mastery of knowledge processes as the key factor in production and productivity?) is being perceived, even if not as yet actively promulgated – as radical change and radical change brings into question established structures, long established beliefs, and fiercely defended practices. One of these beliefs is that there is a clear, definite set of relations between

teachers and students, in classroom, and captured by terms like knowledge 'acquisition', 'transmission' and by clear cut roles, responsibilities and ratios between volume of students and highly trained teachers. Other teaching or teaching-related roles than those performed by highly trained specialist teachers are not brought into consideration in these frames of reference and models of learning, which are derived from face-to-face, teacher directed instruction. 'Transformation', like its ally 'constructivism', challenges all this and therefore by implication at least brings into question many assumptions on which projections of future teacher demand and of the kinds of teachers needed have been grounded.

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The importance of *Teacher Quality* as a key determinant of students' experiences and outcomes of schooling

Ken Rowe

Australian Council for Educational Research

Dr Ken Rowe is the Research Director of ACER's *Learning Processes and Contexts* program. Ken's substantive research interests include: 'authentic' educational and psychological assessment; multilevel, 'value-added' performance indicators and bench-marking; teacher and school effectiveness; and differential gender effects of schooling in the context of teaching and learning. Ken has a particular interest in the overlap between education and health, including: the impact of auditory processing and externalising behaviour problems on students' learning outcomes; and the educational/epidemiological effects of Attention-Deficit/Hyperactivity Disorder (AD/HD) and Chronic Fatigue Syndrome (CFS) in children and adolescents.

Abstract: Much of the traditional and prevailing dogmas surrounding 'factors' affecting students' experiences and outcomes of schooling throughout their primary and secondary years – especially socio-cultural and socio-economic factors – are now understood to be products of methodological and statistical artefact, and amount to little more than 'religious' adherence to the moribund ideologies of *biological* and *social determinism*. Moreover, post-modernist perspectives espoused by academics promoting the de-construction of *gender-specific pedagogy* and '*middle-class*' *curricula*, are equally unhelpful. Above all, a good deal of this 'discourse' is not supported by findings from evidence-based research. In this paper, key findings are presented highlighting '**real**' effects from recent and emerging local and international research on *educational effectiveness*. For example, whereas students' literacy skills, general academic achievements, attitudes, behaviours and experiences of schooling are influenced by their background and intake characteristics, **the magnitude of these effects pale into insignificance compared with class/teacher effects**. That is, the **quality of teaching and learning provision** are by far the most salient influences on students' cognitive, affective, and behavioural outcomes of schooling – regardless of their gender or backgrounds. Indeed, findings from the related local and international evidence-based research indicate that '**what matters most**' is **quality teachers and teaching, supported by strategic teacher professional development!**

Prelude

(Sources: Rowe, 2000b; Slade, 2002):

Ms xxx is a great teacher; she really cares about us. The other teachers at this school are crap!

(Year 6 student)

Our Maths teacher is bloody useless – he just gives out work sheets, then sits down and falls asleep!!

(Year 7 student)

There are too many bad teachers in this school who don't give a shit about us kids

(Year 8 student)

Whatever they do, is what we do. If they're a good teacher and they do better stuff, we do better stuff. If they're a crappy teacher, we do bad stuff

(Year 9 student)

English is boring, but Mr xxx knows his stuff and gets excited about it. So we don't muck-around; we work hard and get a lot out of it

(Year 10 student)

Next year in Year 12, I want to get a good ENTER score so I'm doing those subjects that have the best teachers. The trouble is, there's not enough good teachers. Good teachers make all the difference!

(Year 11 student)

Educational effectiveness and teacher quality

The international context

The provision of schooling is one of the most massive and ubiquitous undertakings of the modern state. Schools account for a substantial proportion of public and private expenditure and are universally regarded as vital instruments of social and economic policy aimed at promoting individual fulfilment, social progress and national prosperity. Moreover, since schooling generates a substantial quantity of paid employment for teachers and administrators, it is not surprising that there has long been an interest in knowing how *effective* the provision of school education is and how it can be improved.¹ What is surprising is the shakiness of our knowledge about *educational effectiveness* in terms of both experiences and outcomes of schooling for students, teachers, parents and the wider community. Even more intriguing is that the journey² taken by researchers since the 1960s in search of answers appears, 40 years later, to have only begun casting light on what **really matters** in affecting students' experiences and outcomes of schooling, namely, **teacher quality**.

Disappointingly, this 'light' was **not** evident in the bulk of keynote addresses and papers presented at the 2003 conference of the *International Congress for School Effectiveness and Improvement* (ICSEI) held at the

¹See, for example: Coleman et al. (1966); DES (1984); Goodlad (1982, 1983); Jencks et al. (1972); Mortimore (1992); OECD (1983); Reynolds, Hopkins & Stoll (1993); Rowe (2001); Rutter et al. (1979).
²For sustained accounts of this journey see: Bosker & Scheerens (1994); Creemers & Scheerens (1994); Mortimore (1991, 1992); Reynolds & Cuttance (1992); Reynolds et al. (1994); Scheerens (1992, 1993); Scheerens & Bosker (1997).

Sydney Convention Centre (January 5–8, 2003). With very few exceptions (for example, Watts, 2003), presentations focusing on the importance of *teacher quality* were conspicuous by their absence. Rather, the conference was characterised by ‘offerings’ advocating *structural* changes for systemic, standards-based reform (including curriculum *deconstruction* and *reconstruction*) that have a long and not-so-distinguished history of rarely ‘penetrating the classroom door’.

Consistent with the adoption of corporate management models in educational governance and the prevailing climate of ‘outcomes-driven’ economic rationalism in which such models operate, policy activity related to issues of *accountability*, *assessment monitoring*, *performance indicators*, *quality assurance* and *school effectiveness* is widespread. However, economic and industrial issues surrounding *school effectiveness* and *teacher quality* are especially sensitive ones at the present time given the level of consensus regarding the importance of school education as an essential element of both micro- and macro economic reform, and in meeting the constantly changing demands of the modern workplace (OECD, 1986, 1989, 1993). Proclamations by the international media magnate Rupert Murdoch at the National Press Club on October 12, 2001, serve to underscore this importance. On this occasion, Murdoch asserted that if Australia continues with its reluctance to invest in the quality of its primary, secondary and tertiary educational infrastructure, and especially in *teacher quality*, ‘...Australia will end up even further behind the international economic “8-ball” than it is at present, such that Paul Keating’s “banana republic” prognostications will become a reality’.

Despite the difficulties entailed in defining an *effective school* or a *quality teacher* (see Cheng, 1996; Mortimore, 1991; Sammons, 1996),³ the work on school effectiveness to date has primarily focused on the search for ways to measure the *quality* of a school – defined almost exclusively in terms of students’ academic achievement progress in Literacy and Numeracy. Although the term *quality* is likewise problematic (see Istance & Lowe, 1991), the ‘...measurement of the quality of schooling is of critical importance at a time when so much school reform in so many parts of the world is being undertaken’ (Mortimore, 1991, p. 214). Nonetheless, for the past 25 years, concern about the *quality* of school education has become a high priority policy issue in all OECD countries where attention has focused on ways of assessing the *quality* of schools, of identifying factors associated with *effective schooling*, and on using such knowledge to achieve further improvements in quality.⁴

It has been noted frequently that school effectiveness research grew out of studies of *educational effectiveness* focusing on production functions (Fraser, Walberg, Welch & Hattie, 1987; Hanushek, 1979, 1985, 1986; Monk, 1992), and more especially out of the initial sociologically oriented input-output studies by Coleman et al. (1966), and by Jencks et al. (1972). These researchers were interested primarily in issues of social ‘equity’ and the influence of the school relative to that of ‘sociologically-determined’ background characteristics of students. Their findings were interpreted as casting serious doubts on the capacity of schools to make a difference relative to the influence of the socio-cultural and economic capital of home background. Indeed, for the past 40 years, the major theories (or models) of learning processes (for example, Bennett, 1978; Bloom, 1976; Carroll, 1963), and the ‘process-product’ research generated by them (Brophy, 1986; Fraser et al., 1987), have primarily focused on *school learning*, or ‘...holistic conceptions of student learning in classroom settings’ (Boekaerts, 1986, p. 129). Such has been the case despite consistent findings indicating that school factors including, financial and material resources, class size, teachers’ qualifications, classroom organisation and teaching methods, account for less than 15 per cent of the variance in measures of student achievement.⁵

Rather, during these 40 years, influential studies such as those reported by Coleman et al. (1966) and Jencks et al. (1972) in the USA, and Bernstein (1971), Peaker (1967) and Plowden (1967) in Britain, ‘...provided evidence that schools and teachers are not effective in enhancing achievement’ (Hattie, 1992, p. 9). Indeed, findings from these early studies suggested that school effects have little impact on students’ learning outcomes. For example, after estimating that only nine per cent of the variance in student achievement measures was due to school effects, Coleman et al. (1966) came to the somewhat depressing conclusion that ‘...schools bring little influence to bear on a child’s achievement that is independent of his background and general social context’ (p. 325). The consensus of findings from these studies was that ethnic and family socio-economic (SES) background factors constituted the dominant determinants of students’ educational outcomes. Reynolds, Hargreaves and Blackstone (1980, p. 208) summarised this consensus in the following terms: ‘...variations in what children learn at school depends largely upon variations in what they bring and not on variations in what schools offer them’. In what has become a familiar pattern, the conclusions arrived at by this early research were consistent with prevailing social and political opinion. However, a growing number of researchers have since

³Mortimore (1991, p. 216) suggests the following ‘outcomes-oriented’ definition: ‘An effective school is one in which pupils progress further than might be expected from consideration of its intake.’

⁴See Ainley, Fleming & Rowe (2002); Banks (1992); Chapman et al. (1991); Coleman & Collinge (1991); Creemers & Scheerens (1989); Cuttance (1992); Hill et al. (1996); Forster, Masters & Rowe (2001); McGaw, Piper, Banks & Evans (1992); Reynolds & Cuttance (1992); Rowe (2001a); Rowe, Holmes-Smith & Hill (1993).

⁵For example: Bosker et al. (1994); Bosker & Witziers (1995); Hanushek (1979, 1986); Glass (1992); Glass et al. (1982); Hattie (1992); Monk (1992).

provided contrary evidence to the claims that relative to home background influences the effects of schooling are negligible.⁶ Many of these researchers have been critical of findings from studies such as Coleman et al. and Jenks et al. because the inherent hierarchical nature of the data had not been taken into account.

Early studies of school effectiveness such as those by Brookover, Beady, Flood, Schweitzer and Wisenbaker (1979); Edmonds (1979a) and by Rutter, Maughan, Mortimer, Ouston and Smith (1979), were conceived largely as a reaction to the Coleman and Jencks conclusions. The Brookover, Edmonds and Rutter studies adopted a different starting point and focused on identifying contextual features of schools in which students were performing better than their counterparts in comparable schools, after adjusting for the effects of intake characteristics. Given this starting point, the positive conclusions from such studies and the enthusiasm with which they were promoted was not unexpected. The message from this work is that effective schools are characterised by an 'ethos' or 'culture' oriented towards learning, expressed in terms of high standards and expectations of students, an emphasis on basic skills, a high level of involvement in decision-making and professionalism among teachers, cohesiveness, clear policies on matters such as homework and student behaviour, and so on. Moreover, 'effective schools' were also supposed to be characterised by outstanding educational leadership, particularly as exercised by the principal and directed at establishing agreed goals, increasing competence and involvement of staff and at clarifying roles and expectations. Edmonds (1979b) was the first to summarise these features into what has become known as the 'five factor model' of school effectiveness, namely:

1. purposeful educational leadership;
2. challenging teaching and high expectations of students;
3. involvement of and consistency among teachers;
4. a positive and orderly climate; and
5. frequent evaluation of student progress.

This 'five factor model' continues to form the basis of what might be termed the *optimistic account* of school effectiveness research – an account that presents a positive picture of the role and efficacy of *structural* or *contextual* school influences. In addition to the well known critiques of the 'five-factor model' (for example, Ralph & Fenessey, 1983; Scheerens & Creemers, 1989), there are several problems with the *optimistic account*, not the least of which is that it was built upon an extremely fragile research base.

First, the little empirical evidence available was not extensive, with most of the knowledge base being derived from small-scale case studies; but mostly from scholarly reviews and comment (for example, Good & Weinstein, 1986; Purkey & Smith, 1993; Levine & Lezotte, 1990; Wilson & Corcoran, 1988). For example, the 1979 study by Rutter et al. was based on observations made in just 12 inner London schools. Banks (1992, p. 19) noted that '...the relevant (research) literature on effective schools is not extensive, with scholarly comment and critique constituting the major proportion'.

Second, there have been relatively few large-scale studies capable of providing valid generalisations, and fewer still that have collected longitudinal data that are essential for the estimation of specific effects of schools over and above that which students bring with them (see Raudenbush, 1989). Nuttall et al. (1989, p. 775) suggest that it is necessary to be cautious in interpreting '...any study of school effectiveness that relies on measures of outcome in just a single year, or stability over time'. While the advice is apt, the logistical problems in mounting and maintaining such studies entail severe practical constraints, resulting in a virtual absence of studies conducted over long periods of time.

Third, the methods typically used to analyse the derived data have not allowed for the modelling of complex interrelationships between inputs, processes and outcomes, including indirect effects and reciprocal effects; nor have they taken into account the inherent nested structure of schooling and the organisation of students into classes taught by particular teachers.⁷ In the preface to their edited collection of related research articles, Raudenbush and Willms (1991, p. xi) observed:

An irony in the history of quantitative studies of schooling has been the failure of researchers' analytic models to reflect adequately the social organization of life in classrooms and schools. The experiences that children share within school settings and the effects of these experiences on their development might be seen as the basic material of educational research; yet until recently, few studies have explicitly taken account of the effects of particular classrooms and schools in which students and teachers share membership.

(1996); Scheerens (1992, 1997); Scheerens & Bosker (1997); Stringfield (1994); Teddlie (1994); Tymms, Merrell & Henderson (1997).

⁶There is now a large literature attesting to the effects of schooling on student learning outcomes. Among the most notable include: Bosker et al. (1994); Bosker & Witziers (1995); Creemers (1994a,b, 1997); Creemers & Reezigt (1996); Creemers & Scheerens (1994); Goldstein (1980, 1987, 1997); Goldstein & Sammons (1997); Hattie (1992); Hill (1997); Hill et al. (1993, 1996); Hill & Rowe (1996); Lee & Bryk (1989); Mortimore (1995); Raudenbush & Willms (1991); Reynolds & Cuttance (1992); Reynolds et al. (1994); Rowe (1991a,b, 1995, 1997a); Rowe & Hill (1994, 1997b); Sammons

⁷See: Bosker & Scheerens (1989, 1994); Hill & Rowe (1996, 1998); Rowe & Hill (1998); Rowe, Hill & Holmes-Smith (1995); Rowe & Rowe (1999); Scheerens (1992); Scheerens & Bosker (1997).

⁸For structural equation modelling, see: Arbuckle & Wothke (1999); Bentler (1980, 1989); Jöreskog & Sörbom (1989, 2002); Kaplan (2000); McDonald (1978); Muthén (1984); Rowe (1997a, 2001a, 2002a).

These are problems that only relatively recent methodological advances have addressed. Two developments are especially worthy of comment. The first is the development of structural equation modelling techniques that enable the simultaneous estimation of interdependent effects among variables within a framework that takes into account measurement error, as well as structural prediction residual.⁸ The second is the development of multilevel analysis techniques that can account for the inherent hierarchical structure of the data, and enable estimation of the influence of variables operating at different levels of analysis.⁹

Fourth, the criterion measures used in school effectiveness studies have typically been limited to scores on standardised tests of cognitive achievement (or on public examinations), with scant attention being paid (if at all) to other highly valued outcomes of schooling that include attitudinal, social and behavioural competencies. Whereas the use of scores on achievement tests for the measurement and identification of *educational effectiveness* is typically justified on the grounds of maximising reliability, this has often been at the expense of validity. That is, while such tests have moderate correlations with measures of student intake characteristics and background factors, they are questionable in terms of their validity as measures of the curriculum taught in classrooms within schools. Moreover, there has long been criticism of the utility of such tests as measures of either learning or competence.¹⁰ Such criticism has gained credence in the areas of standards monitoring and performance assessment, where new approaches to obtaining more curriculum-specific and “authentic” (Wiggins, 1989) measures of assessment are being tried,¹¹ but it is a criticism that has been largely ignored in almost all studies of school effectiveness.

These methodological criticisms of the early school effectiveness research have provided the impetus for a relatively small number of ‘second generation’ studies and to an even smaller number of what Scheerens (1992, 1995), and Scheerens and Bosker (1997) refer to as ‘state-of-the-art’ studies.¹² These more recent studies consistently find that differences between schools, when relevant prior achievement and ‘intake’ characteristics of students are taken into account, are

important but not especially large – a finding that is confirmed by results from a comprehensive meta-analytic study by Bosker and Witziers (1995) and by the work of Marks (2000). Moreover, they are of an order of magnitude close to that estimated by Coleman and Jencks (that is ~ nine per cent of the variance).¹³ At the same time, those studies that have been designed to enable the estimation of class-level effects have consistently identified larger proportions of between-class/teacher variance. This, in turn, has prompted a renewed focus on *teacher quality* and *instructional effectiveness*, and to some redefinition of the fundamental questions underpinning educational effectiveness research (see: Creemers, 1992; Slavin, 1994, 1996; Rowe, 2003a; Rowe & Rowe, 2003).

The small number of ‘state of the art’ educational effectiveness studies undoubtedly reflects the fact that the technical and logistical demands of such studies are immense. In the Australian context, the *Victorian Quality Schools Project* (Hill, Holmes-Smith & Rowe, 1993; Hill & Rowe, 1996, 1998; Hill et al., 1996; Rowe & Hill, 1998; Rowe & Rowe, 1999) was the first major empirical study of school and teacher effectiveness, although there has been an important national study by McGaw and colleagues into parent and teacher perceptions of what makes an effective school (McGaw, Piper, Banks & Evans, 1992) – mentioned in more detail later.

Nonetheless, the little relevant research that has been done during the past 25 years has tended to suggest that administrative and social organisational features of schools are important factors influencing both teachers and students.¹⁴ This work, focused mostly on student achievement outcomes, has stemmed mainly from two sources: research on effective schools,¹⁵ and the relative effectiveness of public and private schools.¹⁶ In fact, organisational factors were seen as important determinants of effective schools,¹⁷ with frequently cited features including the school’s organisational culture, ethos or climate (Grant, 1988; Lightfoot, 1983; Rutter *et al.*, 1979).

Even where empirical work has been done, difficulties in demonstrating direct links between school organisation and student outcomes continue to be commonplace. The reasons for these difficulties are

⁸See: Aitkin & Longford (1986); Bock (1989); Bryk & Raudenbush (1988, 1992); Goldstein (1986, 1987, 1995); Hox (1994); Kreft & de Leeuw (1998); McDonald (1994); Rasbash et al. (1996, 2002); Raudenbush & Willms (1991); Rowe (1999a, 2003b).

⁹For example, see: Darling-Hammond (1994); Frederiksen (1984); Lacey & Lawton (1981); Linn (1986); Newman & Archbald (1990, 1992); Rowe & Hill (1996); Wigdor & Garner (1982).

¹⁰See, for example: Goldstein & Lewis (1996); Lesh & Lamon (1992); Masters & Forster (1997a,b); Moss (1994); Murphy (1995); Nisbet (1993); O’Connor (1992); Resnick & Resnick (1992); Rowe & Hill (1996); Shavelson (1994); Taylor (1994).

¹¹That is: Bosker, Kremers & Lugthart (1990); Brandsma (1993); Mortimore et al. (1988); Hill et al. (1996); Hill & Rowe (1996, 1998); Rowe (1991, 1997); Rowe & Hill (1998); Rowe & Rowe (1992a,b, 1999); Teddlie & Stringfield (1993).

¹²See, for example: the *ILEA Junior School Project* reported by Mortimore et al. (1985, 1988, 1989); the re-analysis of IEA data reported by Scheerens, Vermeulen & Pelgrum (1989); findings from the *Victorian Quality Schools Project* (Hill et al., 1993, 1996; Hill & Rowe, 1996, 1998; Rowe & Hill, 1998; Rowe & Rowe, 1999); and key results from the *VCE Data Project* reported by Rowe, Turner & Lane (1999, 2002).

¹³See: Ainley, Reed & Miller (1986); Hill et al. (1993, 1996); Lee, Dedrick & Smith (1991); Rosenholtz (1989); Rowe (1991).

¹⁴For comprehensive reviews at this time, see: Banks (1992); Bosker, Creemers & Scheerens (1994); Creemers & Scheerens (1989); McGaw et al. (1992); Raudenbush & Willms (1991); Reynolds & Cuttance (1992); Rowe, Hill, and Holmes-Smith (1994); Scheerens (1993).

¹⁵For example, see: Anderson (1990, 1992); Graetz (1990); Lee & Bryk (1989); Steedman (1983); Williams & Carpenter (1990, 1991).

¹⁶See: Chubb (1988); Chubb & Moe (1990); McNeil (1986); Metz (1986); Newman, Rutter & Smith (1989).

¹⁷See: Bidwell & Kasarda (1980); Ecob et al. (1982); Goldstein (1980); Rowe & Hill (1998); Mortimore et al. (1988a,b); Ralph & Fenessey (1983); Rowe (1989); Rowe & Hill (1994).

both substantive and methodological.¹⁸ The substantive difficulties arise from a general failure to realise that it is more appropriate to conceptualise the link between schools and students as *indirect* and mediated by teachers (Lee, Dedrick & Smith, 1991). According to this view, school organisation factors influence how teachers conduct their work and how they teach. In turn, teachers' practices influence students' learning. While strong relationships have been demonstrated between student achievement and teachers' levels of "efficacy" (Ashton & Webb, 1986) and 'commitment' (Rosenholtz, 1985), the findings from such studies are limited because their analyses did not take hierarchical relationships into account.

The Australian context

In March 1991, focus on school and teacher effectiveness issues were given particular impetus by the Australian government's provision of \$10.5 million for the three-year *Good Schools Strategy* and its related projects, namely, the *National Schools Project* (NSP) and the *National Project on the Quality of Teaching and Learning* – NPQTL (Schools Council, 1991).

Nevertheless, Hill (1992, p. 403) missed the crucial point about *quality teaching and learning* by noting: 'The NSP is a major action research activity of the NPQTL to investigate how changes to **work organisation** can lead to improved student learning outcomes'.

Furthermore, following guidelines for school self-management linked to quality outcomes, as outlined by Caldwell (1993) and Caldwell & Spinks (1988, 1992), the incoming Victorian government at the time launched its *Schools of the Future* policy initiative (Directorate of School Education, 1993) that was designed to:

... maximise the proportion of the educational dollar which is deployed at the school level and give schools the capacity to match resources to the educational needs of students. Its major features include the equitable allocation of resources to schools, ... increased accountability for outcomes, and a strengthening of the role of the principal as an educational leader (Caldwell, 1993, p. 1).

Similarly, the expressed aim of the Quality Assurance Directorate of the New South Wales Department of School Education at that time was to '...bring together two distinct aspects of work in education systems: accountability and school development' (Cuttance, 1992, p. 1). In this context, Rowe and Sykes (1989, p. 129) had noted earlier that: 'One of the effects of such proposals has been to signal major shifts in government policy intention to bring the delivery of "professional" educational services into "public sector" accounting, underscored by a concern to ensure that such services represent "value for money"'.

However, the focus on *teacher quality* via the NPQTL remained as a mere artefact of political and bureaucratic rhetoric.

Whereas this activity confirmed an increasing national approach to educational governance and accountability by the Australian Federal Government, first signalled in the paper entitled *Strengthening Australia's Schools* (Dawkins, 1988), the research base and related evidence to support these major policy initiatives was, and continues to be, extremely limited. On the basis of an intensive study of models of school effectiveness up to that time, Banks (1992, p. 199) observed:

Research on effective schools is being used to shape major policy-making initiatives in Australia and overseas, even though what makes some schools more effective than others remains an open question. Because clear and unequivocal messages to educators and policy makers are yet to emerge from the research, unquestioning acceptance of the current findings should be a cause for concern.

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Quality Teaching for Diverse Students in Schooling: Best Evidence Synthesis – What role this kind of work can and can't take in building teaching quality?

Adrienne Alton-Lee

Ministry of Education, New Zealand

Dr Adrienne Alton-Lee is a Senior Policy Analyst in the Medium Term Strategy Policy Division of the New Zealand Ministry of Education. She has previously been a primary teacher, Professor of Teacher Education and Associate Editor of *Teaching and Teacher Education*. Her classroom research with Graham Nuthall has been published in a range of educational journals including the *Harvard Educational Review*. Her current work involves leading work using a best evidence synthesis approach to strengthen the evidence-base for policy and practice.

Where is the wisdom we have lost in knowledge?

Where is the knowledge we have lost in information?

T.S. Eliot (1934)¹

The Medium Term Strategy Policy Division of the New Zealand Ministry of Education developed the best evidence synthesis *Quality Teaching for Diverse Students in Schooling* to strengthen the evidence-base for policy and practice in schooling. The full synthesis can be located at www.minedu.govt.nz/goto/bestevidencesynthesis.

Quality teaching as a key system influence on education outcomes

Quality teaching has been identified as a key system influence on outcomes for diverse students. An analysis of the evidence from multi-level schooling studies reveals that up to 59 per cent of variance in student performance is attributable to differences between teachers and classes, while up to almost 21 per cent, but generally less, is attributable to school level variables. New Zealand achievement results show very wide disparities; the highest for 32 countries in the Programme for International Student Assessment for the reading literacy achievement of 15-year-olds. The New Zealand results show wide within-school variance but very low between-school variance by international comparison. It is noted with particular reference to NZ in the OCED Indicators 2002 that this finding suggests 'individual schools need to cater to a more diverse client base' (p.85)

Responsiveness to diversity

The central professional challenge for teachers is to manage simultaneously the complexity of learning needs of diverse students. The concept of 'diversity' is central to the synthesis. This frame rejects the notion of a 'normal' group and 'other' or minority groups of children and constitutes diversity and difference as central to the classroom endeavour. The empirical

evidence is seen to show that teaching that is responsive to student diversity can have very positive impacts on low and high achievers at the same time. Diversity encompasses many characteristics including ethnicity, socio-economic background, home language, gender, special needs, disability, and giftedness. Teaching needs to be responsive to diversity within ethnic groups, for example, diversity within Pakeha, Māori, Pasifika and Asian students. The best evidence synthesis emphasises the need to recognise the diversity within individual students influenced by intersections of gender, cultural heritage(s), socio-economic background, and talent.

Focusing on what makes a bigger difference for learners

Best evidence synthesis is used as a tool that helps discriminate between the many claims about quality teaching through focusing on those approaches that have been shown to make a bigger difference for students. The best evidence synthesis approach involves a systematic review and synthesis of the evidence about teaching approaches/ characteristics that make a bigger difference for diverse learners – simultaneously. The analysis attends to a range of outcomes sought from New Zealand schooling, including academic and social outcomes and cultural identity. The best evidence synthesis draws on different kinds of research approaches as long as the study makes credible links to student outcomes. While through the inclusion of meta-analytic findings the synthesis brings together the evidence from thousands of studies of research on teaching and learning, it is through the case studies that the implications become transparent in ways that are helpful for practice.

The synthesis findings

This best evidence synthesis has produced ten characteristics of quality teaching derived from a

¹Eliot, T.S. (1934). *The rock*. London: Faber & Faber.

synthesis of research findings of evidence linked to student outcomes. The ten characteristics are interdependent. The characteristics of quality teaching derived from the research are generic in that they reflect principles derived from research across the curriculum and for students across the range of schooling years in New Zealand (from age 5 to 18). How the principles apply in practice is, however, dependent on the curriculum area, and the experience, prior knowledge and needs of the learners in any particular context. The body of this synthesis provides examples from the research on learning and teaching to illustrate the principles for different curricular areas across schooling from junior primary to senior secondary classes.

1. Quality teaching is focused on student achievement (including social outcomes) and facilitates high standards of student outcomes for heterogeneous groups of students.

Research-based characteristics

- Quality teaching is focussed on raising student achievement (including social outcomes).
- Quality teaching facilitates the learning of diverse students and raises achievement for all learners.
- The teacher establishes and follows through on appropriate expectations for learning outcomes and the pace at which learning should proceed.
- High expectations are necessary but not sufficient, and can be counterproductive, when not supported by quality teaching.

2. Pedagogical practices enable classes and other learning groupings to work as caring, inclusive, and cohesive learning communities.

The learning community concept has arisen out of the research literature and denotes both a central focus on learning and the interdependence of the social and the academic in optimising learning conditions.

Research-based characteristics

- Pedagogical practices create an environment that works as a learning community.
- Student motivation is optimised and students' aspirations are supported and extended.
- Caring and support is generated through the practices and interactions of teacher(s) and students.
- Pedagogical practices pro-actively value and address diversity.
- Academic norms are strong and not subverted by social norms.

- The language and practices of the classroom are inclusive of all students.
- Teachers use class sessions to value diversity, and to build community and cohesion.
- Teaching and tasks are structured to support, and students demonstrate, active learning orientations.
- Teaching includes specific training in collaborative group work with individual accountability mechanisms, and students demonstrate effective co-operative and social skills that enable group processes to facilitate learning for all participants.
- Students help each other with resource access and provide elaborated explanations.
- Pedagogical practice is appropriately responsive to the interdependence of socio-cultural and cognitive dimensions.

3. Effective links are created between school and other cultural contexts in which students are socialised, to facilitate learning.

Research-based characteristics

- Teachers ensure that student experiences of instruction have known relationships to other cultural contexts in which the students have been/are socialised.
 - Relevance is made transparent to students.
 - Cultural practices at school are made transparent and taught.
 - Ways of taking meaning from text, discourse, numbers or experience are made explicit.
 - Quality teaching recognises and builds on students' prior experiences and knowledge.
 - New information is linked to student experiences.
 - Student diversity is utilised effectively as a pedagogical resource.
- Quality teaching respects and affirms cultural identity (including gender identity) and optimises educational opportunities.
- Quality teaching effects are maximised when supported by effective school-home partnership practices focused on student learning. School-home partnerships that have shown the most positive impacts on student outcomes have student learning as their focus.
- When educators enable quality alignments in practices between teachers and parent/caregivers to support learning and skill development then student achievement can be optimised.
- Teachers can take agency in encouraging, scaffolding and enabling student-parent/caregiver dialogue around school learning.

- Quality homework can have particularly positive impacts on student learning. The effectiveness of the homework is particularly dependent upon the teacher's ability to construct, resource, scaffold and provide feedback upon appropriate homework tasks that support in-class learning for diverse students and do not unnecessarily fatigue and frustrate students.

4. Quality teaching is responsive to student learning processes.

Research-based characteristics are specific to curriculum context and the prior knowledge and experiences of the learners.

- Teachers have knowledge of the nature of student learning processes in the curriculum area, can interpret student behaviour in the light of this knowledge and are responsive, creative and effective in facilitating learning processes.
- Examples of teaching approaches that are intended to exemplify this characteristic are the dynamic or flexible literacy models, the numeracy strategy focus and the Interactive Teaching Approach in science education.
- Classroom management enables the teacher to be responsive to diverse learners.
- Responsive teaching is important for all learners and particularly critical for students with special needs.

5. Opportunity to learn is effective and sufficient.

Research-based characteristics

- Quality teaching provides sufficient and effective opportunity to learn.
- Management practices facilitate learning (rather than emphasising compliant behaviour or control).
- Curriculum enactment has coherence, interconnectedness and links are made to real life relevance.
- Curriculum content addresses diversity appropriately and effectively.
- Quality teaching includes and optimises the effective use of non-linguistic representations by teacher and students. (This assumes the concurrent and rich use of oral language and text as central to literacy across the curriculum.)
- Students have opportunities to resolve cognitive conflict.
- Students have sufficient and appropriate opportunities for practice and application.

6. Multiple task contexts support learning cycles.

Research-based characteristics

- Task cycles match developmental learning cycles of students.
- Task cycles enable students to engage in and complete learning processes so that what is learned is remembered.
- Optimal use is made of complementary combinations of teacher-directed groupings, co-operative groups, structured peer interaction and individual work (including homework) to facilitate learning cycles.

7. Curriculum goals, resources including ICT usage, task design, teaching and school practices are effectively aligned.

Research-based characteristics

- Curricular alignment: The use of resources, teaching materials and ICT is aligned with curriculum goals to optimise student motivation and accomplish instructional purposes and goals.
- Curricular alignment optimises rather than inhibits critical thinking.
- Pedagogical strategies are evaluated in relation to curricular goals.
- ICT usage is integrated into pedagogical practice across the curriculum.
- Quality teaching is optimised when there is whole school alignment around evidence-based practices.
- The school maintains an 'unrelenting focus on student achievement and learning'².
- There is whole school alignment and coherence across policies and practices that focus on, resource and support quality teaching for diverse students.
- Pro-active alignment across the school supports effective inclusion of diverse students within the school community.
- Whole school alignment optimises opportunity to learn, particularly in language immersion, literacy, ICT, social studies and health.
- Whole school alignment enables a common language, teacher collaboration and reflection and other synergies around improving teaching.
- Whole school alignment minimises disruptions to quality teaching and sustains continuous improvement.
- School policies and practices initiate, and support teachers in maintaining, school-home partnerships focused on learning.

²Hopkins, D. (2001). *School improvement for real*. London: Routledge. (p. 185).

8. Pedagogy scaffolds and provides appropriate feedback on students' task engagement.

Research-based characteristics

- Tasks and classroom interactions provide scaffolds to facilitate student learning (the teacher provides whatever assistance diverse students need to enable them to engage in learning activities productively, for example, teacher use of prompts, questions, and appropriate resources including social resources).
- Teaching develops all students' information skills and ensures students' ready access to resources when needed to assist the learning process.
- Students receive effective, specific, appropriately frequent, positive and responsive feedback. Feedback must be neither too infrequent so that a student does not receive appropriate feedback nor too frequent so that the learning process is subverted.

9. Pedagogy promotes learning orientations, student self-regulation, metacognitive strategies and thoughtful student discourse

Research-based characteristics

- Quality teaching promotes learning orientations and student self-regulation.
- Teaching promotes metacognitive strategy use (for example, mental strategies in numeracy) by all students.
- Teaching scaffolds reciprocal or alternating tuakana teina³ roles in student group, or interactive work.
- Teaching promotes sustained thoughtfulness (for example, through questioning approaches, wait-time, and the provision of opportunities for application and invention).
- Teaching promotes critical thinking.
- Teaching makes transparent to students the links between strategic effort and accomplishment.

10. Teachers and students engage constructively in goal-oriented assessment.

Research-based characteristics

- Assessment practices improve learning.
- Teachers and students have clear information about learning outcomes.

- Students have a strong sense of involvement in the process of setting specific learning goals.
- Pedagogy scaffolds and provides appropriate feedback on students' task engagement.
- Teachers ensure that their assessment practices impact positively on students' motivation.
- Teachers manage the evaluative climate, particularly in context of public discussion, so that student covert or overt participation is supported, scaffolded and challenged without students being humiliated.
- Teachers manage the evaluative climate so that academic norms are not undermined but supported by social norms.
- Teachers adjust their teaching to take account of the results of assessment.

What role this kind of work can and can't take in building teaching quality?

The final section of the presentation will focus on policy implications and risks. This will include a consideration of the potential and limitations of this kind of work to support teachers in making a bigger difference for diverse students. In particular, questions will be raised about the need for a strengthened evidence base about the nature of educational change.

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³See Royal Tangaere, A. (1997). Māori human development learning theory. In P. Te Whaiti, M. McCarthy & A. Durie (Eds.), *Mai I Rangitaatea Māori well-being and development*. Auckland: Auckland University Press with Bridget Williams Books. Derived from older sibling (tuakana) and younger sibling (teina). A practice where 'the learner ... shifts roles and become(s) the teacher, and for the teacher to become the learner... The concept of tuakana/teina also operates through the dual nature of ako. The word ako means to learn as well as to teach.' (p. 50).

Evaluating the quality and impact of professional development programs

Lawrence Ingvarson, Marion Meiers and Adrian Beavis

Teaching and Learning Research Program, Australian Council for Educational Research

Professional development for teachers is now recognised as a vital component of policies to enhance the quality of teaching and learning in our schools. Consequently, there is increased interest in research that identifies features of effective professional learning. Considerable funds are allocated to a wide variety of professional development programs from a variety of sources. As investment increases, policy makers are increasingly asking for evidence about its effects not only on classroom practice, but on student learning outcomes. They are also looking for research that can guide them in designing programs that are more likely to lead to significant and sustained improvement in student opportunities to learn.

There is a need, therefore, for more sophisticated methods of evaluating professional development, with the capacity to meet these information needs. In the not too distant past, when many professional development courses placed teachers in the role of an audience, questionnaires distributed at the door as teachers left sufficed. Strategies for professional development have now become much more complex, long term and embedded in schools. Major funds may be allocated to training school-based staff developers and providing them with time release, developing curriculum support materials, time release, on-line learning and so on.

The kinds of questions that evaluators now need to answer are much more penetrating than questions such as “What did you learn from the workshop?” They are questions about program logic and the presumed links between professional learning strategies, and changes in teacher knowledge, classroom practices and student outcomes. These questions call for large-scale studies with the capacity to test these relationships across large numbers of different professional development programs.

Purpose of this paper

The purpose of this paper is to review recent work that ACER has been doing to improve the usefulness of evaluations of professional development programs. This work includes the development of research-based instruments to measure:

- the nature and quality of the *processes* used to promote teacher learning;

- the *impact* of programs on teacher knowledge, practice and student outcomes;
- the relationships between these process and impact measures.

The paper is based on approaches developed as part of four recent evaluations of professional development programs. These include:

- three evaluations of the Commonwealth Government’s Quality Teacher Program, as implemented in three separate states: New South Wales, CEC Victoria and the Northern Territory; and
- a major research study funded by the Commonwealth Government investigating the links between professional development and student learning outcomes.

Key features of the ACER approach to evaluation

Cross-program analysis

In each of these evaluation studies, data was gathered from a number of PD programs. In evaluating the NSW QTP, for example, data was gathered from 41 programs and 1731 teachers. In conducting all four evaluations, data was gathered from a total of 3250 teachers who had participated in eighty different professional programs across all states in Australia. These studies provided a unique opportunity to conduct research looking at the differential impact of a wide range of PD strategies.

Participants in each of these programs were invited to complete a common survey instrument, which asked them to describe both the processes of learning that they had experienced and the impact of these programs on their knowledge, practice, sense of efficacy, and their students’ learning. The survey also asked participants about the impact of the programs on the nature and extent of collaborative work amongst colleagues in their schools. The extent to which programs strengthened, or integrated with professional community activity was a significant predictor of impact.

As might be expected, there were significant differences between programs in the mode of delivery and in the extent to which teachers reported that programs had influenced their practice and benefited their students. These differences opened up the

possibility for cross-program analyses that might:

- a) increase understanding of those features of project design and delivery that might explain variation in impact;
- b) identify school level factors that influence or mediate the outcome of the projects.

Another feature of these studies was that teachers were surveyed at least three months after participating in a program, which provided them with the opportunity to gauge the impact of programs on their practice. Unfortunately this delay was at a some cost to response rates to our mailed surveys, which varied, but averaged around 50%.

Research-based conceptual framework

These analyses called for the development of a conceptual framework to guide the evaluation. The ACER approach to evaluation in each of the four studies was based on the theoretical framework, shown in Figure 1. It presents a model of the main program features that might explain variation in the reported impact of PD programs. The framework was based on a review of recent research into the characteristics of effective professional development programs (Kennedy, 1998; Wilson & Berne, 1998; Garet et al., 2001; Sykes, 2002; Ingvarson & Meiers, 2003; Cohen & Hill, 2000, Hawley & Valli, 1999; Guskey, 2002; Loucks-Horsley et al. 1998; Supovitz, 2001). This research has become increasingly sophisticated over recent years. (Ingvarson, 2002) and provides a firmer foundation on which to develop models to account for the relative differences in the effectiveness of professional development programs.

Figure 1 distinguishes four, linked, types of impact resulting from PD programs. These include impact on teachers' knowledge and practice, student learning and teacher efficacy. The model also includes background (control) variables, structural features, such as the duration of the program and opportunity to learn features, such as "active learning", or "follow up". (Details of how these variables are measured are provided below.)

Mediating variables

Many PD programs aim to strengthen professional community in schools in order to enhance the impact of their programs on classroom practice. Therefore, professional community is included in our model as a mediating variable. In measuring professional community teachers are asked to respond to items such as:

- Teachers at my school discuss teaching and learning more with their colleagues
- Teachers have increased their collaboration in planning, teaching and assessment activities
- I have passed ideas I learned from the project on to other teachers in my school

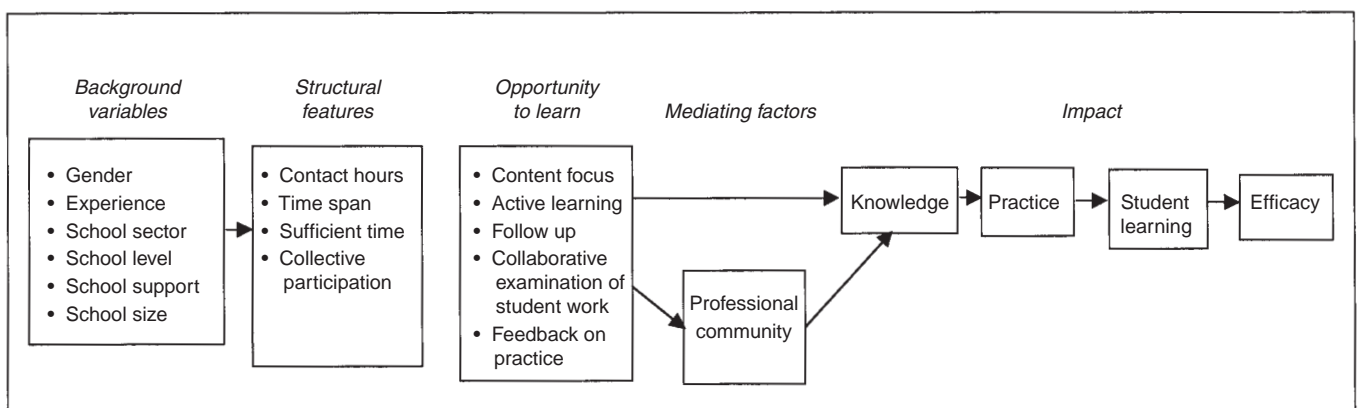
Analyses of program logic and theory of action

The first step in any evaluation is to clarify the focus of the evaluation; that is, to define exactly what it is that is to be evaluated. This involves identifying the key design and process features of the approach being used in a professional development program – what the program looks like in practice and how it is meant to work. This task is not always as straightforward as it may seem, as program designers may not have articulated these matters before.

A feature of the ACER approach to evaluation is the emphasis placed on working in close collaboration with policy makers and providers to identify the essential and critical features of the professional development model they are using. This includes identifying the assumptions about teacher learning on which their models are based, and teasing out the theory of action underlying their programs (how the features of the proposed model link to each other and how they will lead to change).

In working with program designers, ACER staff draw extensively from recent research on the critical features of effective professional development programs (Hawley & Valli, 1999; Ingvarson & Meiers, 2003).

Figure 1 Relationships between structure, learning processes and impact of professional development programs



Use is made of other researchers (e.g. Loucks-Horsley et al., 1998; Sykes, 2002) who provide useful guides to the major types of strategies used to promote professional learning. Heller et al. (2003) and Killion (2003) provide approaches that help to identify the logic underlying programs and how the pieces fit together to promote effective teacher learning.

The outcome of this collaborative work with designers is the production of program profiles that identify:

- the main components in the design (inputs, structures, activities, initial outcomes, longer term outcomes);
- how these components are expected to link together in practice to promote teacher learning; and
- the theory of action that underpins their project (i.e. the mechanisms by which project activities will lead to change in classroom practice).

These program profiles help to provide a clearer idea of the kind of data that needs to be collected in conducting evaluations with the capacity to test the assumptions underlying the professional learning models and provide useful information for refining the programs.

Measures of professional development strategies and learning processes (opportunity to learn)

While we use project profiles to clarify what is to be evaluated, we have found that we can not rely on them entirely as accurate measures of teachers' actual opportunities to learn during programs. A special problem in conducting evaluations of professional development programs is gathering data about what teachers actually do and how they learn in the program; what roles they play as learners and the nature and extent of their actual opportunities for learning.

Designers of professional development programs select from a wide range of strategies to promote professional learning. They often describe the strategies they have chosen in ways that are not particularly helpful for research purposes. They may use terms such as, 'hands on', 'action research', 'workshops', 'training sessions', 'case methods'. What these terms actually mean in terms of teacher learning processes is not always clear. To make the research task even more complex, designers often say they use a large number of these strategies in their programs. So we found it difficult to gain useful measures of actual teacher learning processes by asking program designers about the strategies that characterise their programs.

Rather than relying on what the providers say about the design features and learning processes of their programs, we prefer to rely on what teacher-participants

report about their experience in the program – their actual opportunities to learn. A program may be advertised as 'action research', for example, but teachers' actual experience may be quite different. Program designers may claim to have provided follow up support, but teachers may not have received it.

As indicated above, research now provides a firmer foundation on which to develop models that might account for variation in the effectiveness of professional development programs. The evaluation team used this research to create an instrument for measuring the quality of opportunities for teachers to learn. In developing this instrument (*The Quality of Professional Learning Index*) we used our review of the research literature to identify a number of characteristics of effective professional development. These included:

- content focus
- follow up
- active learning
- feedback
- collaborative examination of student work.

Each of these measures is described briefly below (it is important to note that this instrument is being refined continually in the light of research).

Content focus

Recent research (Kennedy, 1998) indicates the importance of *what* teachers have the opportunity to learn during professional development programs – this research indicates that the substance of what teachers learn is more important than the form or structure of the program (e.g. whether programs are school-based or not, collaboratively planned or not, extended over time, etc.). In summary, this research indicates that professional learning is more likely to improve student learning outcomes if it increases teachers' understanding of the content they teach, how students learn that content and how to represent and convey that content in meaningful ways (Cohen & Hill, 2000).

To measure content focus, teachers are asked about the emphasis given to four aspects of content: content or subject knowledge, knowledge of how students learn content, knowledge of methods of teaching content and models to illustrate those methods of teaching of that content.¹

Active learning

Recent research confirms the importance of importance of teachers being actively engaged in their own learning, but it is the nature of this engagement that seems to matter as much, if not more, than the level.

¹To measure *content focus*, an index was developed based on four items. Teachers responded to these items on a four-point scale from '1 = no emphasis' to '4 = major emphasis'. The scores of each of these items were averaged to give a measure of content focus. A similar process was used to construct all measures

Effective professional development programs draw teachers into an analysis of their current practice in relation to professional standards for good practice. They also draw teachers into close comparison of what their students are learning in relation to what students of that age and circumstance are capable of learning.

To measure active learning, teachers are asked about the extent to which a program engaged them actively in reflecting on their practice, in identifying specific areas of their practice that they needed to develop, and gave them opportunities to test new teaching practices.

Feedback

Feedback on practice has long been recognised as a vital requirement for professional development programs that aim to help teachers develop new skills and integrate them into their practice (Joyce & Showers, 1982). Effective integration of new skills requires programs to have a clear theoretical foundation supported by research, modelling in real settings, and opportunities to practice the new skills and receive feedback from a coach or supporting teacher. Most of the programs we have evaluated recently aimed to help teachers learn new skills. However, we found that few participants actually received assistance and feedback in their classrooms during the critical and difficult implementation phase when they were trying out new practices.

To measure feedback, teachers are asked about the number of times they received feedback on their teaching from other teachers or people involved in the program; and the number of times their teaching was observed by others involved in the program (e.g. from a mentor, or in a team teaching situation).

Collaborative examination of student work

Effective professional development programs lead teachers to examine their students' work in relation to external reference points or standards. Hawley and Valli's (1999) review of research rates this feature as a critical component of effective professional learning programs. It has become clear over recent years that teachers gain a great deal of valuable learning from opportunities to examine student work in collaboration with colleagues - especially their own students' work, and in relation to standards for what students should know and be able to do. Collaborative analyses of student work opens up many avenues for teachers to de-privatise their practice and learn from each other. It also leads to deeper understanding of student learning outcomes and greater discrimination about what counts as meeting those objectives.

To measure *collaborative examination of student work*, we developed an index based on the extent to which teachers said they received opportunities to collaborate with colleagues in examining their own students' work as well as that of other teachers.

Follow up

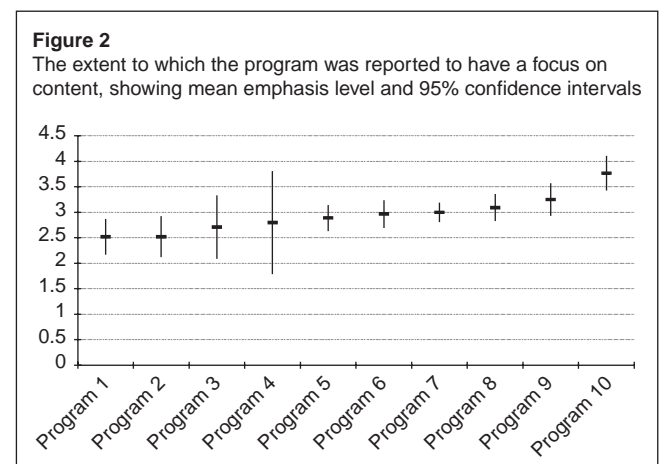
Follow up support to teachers during the implementation phase of change has long been identified as an important feature of more effective programs (Fullan, 1982). Perhaps the strongest criticism of many professional development programs over the years has been the lack of built in provision for 'at the elbow' support for teachers in their classrooms as they apply new ideas and skills (Huberman & Miles, 1984).

To measure *follow-up* we developed an index based on the extent to which teachers reported that a program provided time for follow-up and ongoing assistance in their school or classroom to help them implement changes advocated in the program and opportunities to practice their new learning

Factor analysis confirmed the scales used to measure the five opportunity to learn constructs described above. Details about the psychometric properties of these opportunity to learn variables will be provided in a fuller version of this paper.

Presenting findings about opportunity to learn

Figure 2 shows an example of how we can present findings about these opportunity to learn measures; in this case the level of *content focus*. These findings come from an evaluation of ten professional development programs across Australia (Programs 1-10). Figure 2 shows, for example, significant variation across the ten programs in terms of our measure of content focus. Teachers in Programs 8, 9 and 10 reported that these programs placed more emphasis on content than Program 1, 2 and 3.



Measures of impact based on teaching standards

Another feature of the ACER approach to evaluating professional development programs is the method

developed for measuring impact. In order to conduct research based on the conceptual model in Figure 1, it was necessary to develop a common framework of measures for assessing impact. The ACER evaluation team created a new way of conceptualising and identifying outcomes of PD programs based on standards for effective teaching (Ingvarson, 1998; 2002). We argued that the quality of impact of a PD program should be measured primarily, not in terms of whether it met the developers' objectives, but in terms of the extent to which the program moved teachers' practices towards those associated with research-based standards for effective teaching (Ingvarson, 1998; 2002). (These objectives may be the same, but not necessarily.)

We developed four aspects of *impact* for our recent evaluations: impact on teachers' knowledge; impact on teachers' practice; impact on student learning outcomes; and, impact on teacher efficacy. Teachers report their responses to the following items on a four-point scale from strongly agree to strongly disagree.

Knowledge

Teachers are asked to indicate the extent to which their participation in the PD program has led to increased knowledge of: the content they teach, teaching and learning strategies appropriate to the content they teach, how students learn the content, individual differences amongst students and how to cater for their needs, how to link assessment into the teaching and learning cycle, classroom organisation and management, materials and resources available in their area of teaching.

Practice

Teachers are asked whether, as a result of their participation in the PD program, they now:

- make clearer links between their teaching goals and classroom activities;
- manage classroom structures and activities more effectively;
- use more effective teaching and learning strategies appropriate to the content that they teach;
- use more effective teaching and learning strategies appropriate to the classroom context;
- use teaching and learning strategies that are more challenging and engaging;
- are better able to meet the individual learning needs of their students;
- link assessment into the teaching and learning cycle more effectively;
- provide more effective feedback to their students to support their learning;
- engage students in higher order thinking;
- access and use materials and resources more effectively.

Student learning outcomes

Teachers are asked whether, as a result of the PD program, their students now:

- have fewer difficulties in understanding what they are being taught;
- are learning more purposefully;
- are more actively engaged in learning activities;
- demonstrate enhanced learning outcomes;
- access and use materials and resources more effectively.

Teacher efficacy

Teachers are asked about the extent to which they agree or disagree with the following statements:

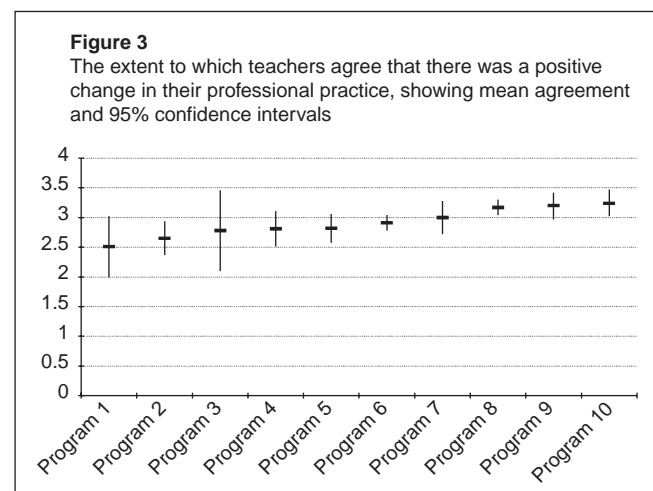
As a result of the PD program:

- My ability to meet the learning needs of my students has been expanded
- My confidence as a teacher has increased

All the above measures had strong scale characteristics and they proved to be sensitive to differences across programs

Comparisons of PD programs in terms of impact

The above measures of impact enabled comparisons to be made across PD programs, such as illustrated in Figure 3 below for impact on practice. Figure 3 compares ten major PD programs. Figure 3 shows that Programs 1 and 2 programs had statistically lower average levels of reported impact on practice than Programs 9 and 10.



Findings

Space here precludes the presentation of anything more than a sample of the types of analyses undertaken in these studies and the findings.

Regression analysis

Blockwise regression analysis is usually conducted in analysing relationships between components of the conceptual model in Figure 1 above. This procedure is based upon a least-squares algorithm to estimate the strength of the linear relationship between the dependent variable and a set of independent variables. Results from the ACER evaluation of the CEC Quality Teacher Program in Victoria are summarised in Table 1. The order in which these variables are entered into the equation is determined by the theory underlying the research (as summarised in Figure 1). There were six control, or background (exogenous), variables in this model, and three blocks of intervening (endogenous) variables: structural feature, learning process and professional community.

Table 1 shows the standardised regression coefficients and significance levels for each of the predictors in the model. The use of standardised co-efficients permits easy comparison of the strength of associations within the model. For example, a standardised beta coefficient of 0.27 is three times as strong in its effect as one of 0.09. When examining these effects it is important to remember that they are net of the effects of other variables in the model. The regression analysis thus shows the unique contribution that each variable makes to changes in the dependent variable. Table 1 (below) also shows the proportion of variance explained by the models (R^2).

The full model accounted for around 59% of the variance in the dependent variable (reported changes in teaching practice) – which means that several features in our model are reasonably good predictors of whether teachers rate professional development programs as effective in terms of changing practice.

The main message from Table 1 (and from other ACER evaluations of professional development programs) is that the block of variables associated with opportunity to learn has significant effects on our measures of impact. The block of variables seen in Table 1 from *Content Focus to Feedback*, together contribute importantly to predicting levels of reported changes in teacher knowledge, practice and teacher efficacy.

Table 1 also indicates that the background variables (non-project related) have weak links to impact. However, the level of associated professional community activity generated by a program, as a mediating variable, has a significant effects on teacher knowledge and practice. Improved practices and improved student learning outcomes, not surprisingly, are strongly associated with teacher reports about the impact of programs on their efficacy.

Similar results could be presented across the four major evaluation studies listed above that ACER has completed recently. A later paper will provide a much more extensive analysis of the findings and a discussion of implications for future investment in professional development for teachers.

Limitations

The approach to evaluation described above is based primarily on teacher self-report data. Given the time frame and the level of resources usually allocated to evaluations of professional development programs, there is often little opportunity to gather first-hand evidence about changes in teacher knowledge, practice, efficacy and students' learning outcomes. However, recent studies (e.g. Mayer, 2001) indicate that it is reasonable to place a certain level of

Table 1 Relationship between background variables, structural features, opportunity to learn, professional community in the school, and teacher knowledge, teacher practice, student learning and teacher efficacy

	Content	Active	Follow up	Collaboration	Feedback	Professional Community	Knowledge	Practice	Student Outcomes	Teacher Efficacy
Gender (F = 0 M=1)	0.01	-0.02	0.08	0.00	0.03	0.01	-0.01	-0.01	-0.02	0.04
School size	-0.04	-0.01	-0.01	-0.04	0.00	-0.03	-0.04	0.01	-0.07	-0.01
Primary = 1 else = 0	0.16	-0.02	0.10	0.00	-0.06	0.02	0.09	-0.02	0.13	-0.05
Vounteered=1 Directed=0	0.01	0.06	-0.01	0.06	-0.01	0.00	0.04	0.05	-0.06	0.02
School Group 1=Y 0=No	0.06	0.02	0.09	0.15	0.03	0.14	0.01	-0.03	0.05	0.02
PD Support in School	0.14	0.05	0.12	0.03	0.06	0.13	-0.05	-0.01	0.05	-0.03
Duration Hours	0.21	0.12	0.07	0.04	0.05	0.01	0.05	-0.05	0.07	-0.02
Span-months	0.11	0.02	0.03	0.13	0.05	-0.01	-0.04	0.07	-0.03	0.05
Sufficient Time	0.19	0.11	0.09	0.02	0.04	0.03	0.06	0.01	0.04	0.06
Content		0.55	0.08	0.28	0.07	0.10	0.35	0.11	0.14	0.11
Active			0.47	0.14	0.00	0.00	0.09	0.09	-0.02	0.22
Follow up				0.30	0.23	0.25	0.09	0.10	0.10	0.00
Collaboration					0.20	0.21	0.07	0.11	0.03	0.10
Feedback						0.16	0.04	0.02	0.06	0.09
Professional Community							0.12	0.15	0.11	0.08
Knowledge								0.57	0.04	0.02
Practice									0.55	0.17
Student Outcomes										0.31
R-square Adjusted	0.20	0.42	0.43	0.49	0.15	0.39	0.38	0.59	0.51	0.50

confidence in surveys that rely on teachers' reports about their practice. Reliability of these self-report data increases with more specific measures, as used in the ACER approach. Also, teachers are not reluctant to speak their minds frankly when it comes to assessing the value of professional development programs. There is little reason to think that their responses might be biased one way or another, or any desire to please, especially when, in studies such as the above, they are contacted several months at least after the programs have finished.

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The role of the 'Teacher': Coming of age?

Professor Terence Lovat

Pro Vice-Chancellor (Education and Arts), The University of Newcastle

Executive Secretary, Australian Council of Deans of Education

Assisted by Dr Chris McKenzie

ACDE

Introduction

The Role of the Teacher: Coming of Age (ACDE, 2003) is one in a series of occasional papers by the Australian Council of Deans of Education (ACDE) aimed at focusing debate on issues of concern to the educational community. The papers follow on from the very successful ACDE Charter (2001). The Charter was compiled by a range of education professionals in the lead-up to the last Federal Election. In the immediate run-up to the election, the President and Secretary met with the Minister and Minister's Education and Training Committee, as well as with the Shadow Minister and leader of the Democrats and Greens to speak about matters arising from the Charter and how they might be relevant to the election agenda.

The Charter appeared to play a role in keeping education in the most highly relevant quadrant of election concerns and clearly had some impact on shaping political responses. Through the expansion of certain issues contained in the occasional papers, ACDE hopes to sustain the high profile of education at the political level and to maintain the level of community debate and interest.

The Role of the Teacher was initially conceived as an update and expansion of Proposition 6 of the 2001 Charter. Proposition 6 had it that '*The Work of Educators will be Transformed*'. While the proposition itself remains current, feedback suggested that the substance put in behind the proposition was restricted, and in some cases was dated by very recent events. It was decided therefore that a more intense study around the proposition was warranted. Particular reference points seen as essential were around the history and tradition of the teaching role as it has come to be perceived in societies of our type, a concentration on developments in teacher education as practical ways in which societal perceptions have been structuralised, and a greater attention to the range of contemporary issues related to the role of the teacher. The result is a paper in four sections: the symbolic power of registration; issues of standards, status and professionalism; new pedagogies and enhanced research understandings; and, challenges for the profession.

Section 1: The symbolic power of registration

The first section deals briefly with the symbolic power of registration. It is asserted that the rapid moves towards teacher registration across the state and territory legislatures of Australia reflects a positive development, granted the tenet of the 1998 Federal Senate (Senate Report, 1998) inquiry into teacher status that concluded:

Registration serves an important purpose as gatekeeper for entry into employment in schools, and registration standards are a vital consideration. Without standards, a professional body is defenceless. A demonstrated ability to articulate standards for high quality practice is an essential credential if a professional body wishes to be taken seriously by the public and policy makers.

Registration therefore provides a major opportunity for matters of professionalism to be considered, implemented and/or strengthened.

Section 2: Fortifying teacher status and professionalism

The second section focuses on other important developments designed to fortify teacher status and professionalism in the generation of standards frameworks and professional codes. This section utilises the terms of reference for status and professionalism employed by the 1998 Senate Inquiry in providing background and context for these developments. Addressing these terms of reference, described as characteristics of professionalism, allows the paper to develop some of the philosophies and historical understandings that underpin it. The terms of reference define the characteristics of professionalism as including:

- (i) a strong motivation or calling;
- (ii) possession of specialised body of knowledge and skills acquired during a long period of education and training;

- (iii) control of standards, admission, career paths and disciplinary issues;
- (iv) autonomy in organising and carrying out their work and the need for the ongoing exercise of professional judgment; and
- (v) members accept and apply a professional code of practice.

The first term of reference provides the opportunity to address the peculiar nature of teacher commitment as a societal service professional, a theme that has been utilised successfully by systems and unions in recent media and marketing on the profession. It has capacity to lift the perception of the motivation behind taking up teaching from being one of 'second choice' to being one of 'first choice', which would seem to match popular perceptions about motivation towards medicine, law and other high status professions.

The second term of reference allows for an extensive coverage of change and development in teacher education throughout a century of changed perceptions and responsibilities for the profession. It also offers the opportunity to re-visit the role of teacher throughout history and across cultures and so to strengthen the perception of its centrality to the notion of 'civilisation'.

The third term of reference offers the chance to examine the universal quest across systems and legislatures to strengthen the public face of teaching through more fortified standards frameworks (see ACE, 2001). The move to standards frameworks has been part of a universal trend and appears to serve as an ancillary to moves towards registration. Discussion around this topic allows for a consideration of the nature of registration that exceeds its mere legislative function.

The fourth term of reference is important for its capacity to appraise the debate around teacher professional autonomy versus perceptions that the role is essentially corporatised, federated and, perhaps, that of para-professional at best. Here, some of the important work of the 1960s to 1980s is able to be revisited and notions of professional autonomy and situation-based curriculum control reappraised for their contribution.

The fifth term of reference allows some coverage of the issue of professional ethics and the desirability (or otherwise) of a code (or codes) of conduct for the profession. In particular, similar developments in related professions are able to be appraised for their informative value to teaching.

Section 3: Quality teaching and pedagogy

The third section of the paper looks at the growth of concern and attention over quality teaching and pedagogy. It suggests that this reflects on earlier

conceptions of teaching that were outweighed by an emphasis on technical competencies, but which have been revived owing to the weight of research evidence that illustrates the integral role played by the pedagogy of the teacher. The NSW Quality Teaching Program (NSW DET, 2000) rationale puts it succinctly in the following words:

...the quality of student learning outcomes is directly dependent on the quality of the teacher; and, the essential components of effective teaching are command of subject, and knowledge of and capacity to implement effective pedagogical practices.

The renewed emphasis on quality teaching is regarded as the single greatest parameter for attention of teacher education personnel, teaching unions and employing systems in the current era. It puts paid to any lingering conceptions that teachers simply need good content knowledge, or simply need to be classroom adaptive. The importance of new pedagogical understanding is attributed in part to Shulman's (1987) earlier conception of 'pedagogical content knowledge' as encapsulating the essential knowledge base of the teacher. The conception, in summary, is that the good teacher is one who knows how to disseminate well-founded discipline knowledge in the particular (and sometimes particularly difficult) environment of classrooms and other constrained and limited educational settings. It is a case of knowing the content, knowing the client(s), knowing the context(s), and being literate and competent in conjoining these to good effect. The conception is the antidote against less complex views of teaching and the teacher role.

Fortification of quality teaching and the pedagogy agenda has been particularly prominent in the past two decades through the work of Newmann (1996), Darling-Hammond (1997), Education Queensland (QLRS, 2001) and, most recently, NSW DET (2003). In their various ways, the entailed projects have strengthened the case for teaching as a rare art and science that requires its own professional knowledge and competency sets. It also strengthens the case of those who would argue that teacher education is a distinctive and essential component of quality assurance in both pre-service and in-service domains.

Section 4: Contemporary issues and challenges

The fourth section of the paper takes up a range of contemporary issues and challenges related to teaching. Among these are issues of supply, remuneration and funding of the education sectors generally. Each of these issues is presented in schematic form for due consideration and ongoing debate.

'Supply and Demand' (see Preston, 2000) has been a chestnut issue for ACDE for much of the past decade. Initially dismissed as a self-serving issue for Deans of Education, supply has now become a concern for systems across the globe. Though it is now taken seriously, ACDE continues to hold the view that official projections of supply fail to take account of the range of factors that are likely to impact. Included among these are the unprecedented retirement rates of teachers and educational leaders over the next five years and, more so, the targeted recruiting ('poaching') policies aimed at Australian teachers by international legislatures, especially in the UK, USA and parts of Asia. While this latter phenomenon appears to be working well as a positive status issue for a clearly well-regarded Australian teaching force, it has huge potential to strip that same force of numbers where they are most needed.

Teacher remuneration, and attached incentive to remain in the profession beyond the years of the normal incremental scale, is an issue in itself related to supply and retention. Alternative models to most of those operative in Australia are explored for their value and potential to address the single largest deficit issue facing Australia's workforce readiness, namely the exorbitant attrition within the first five years after graduation.

Funding of all the education sectors is appraised as an issue in need of national attention, with notions related to more effective conjoining of public and private sources, and the vexed issue of an 'Educare' levy to match the Medicare levy being touted. It is proposed that full funding of all sectors is beyond the capacity of current arrangements and that constructive new ways must be sought to achieve the level of funding required to assure a sustained high quality set of education facilities into the future.

Conclusion

The Role of the Teacher appears to have struck a chord at various levels, with significant media attention, feedback from politicians, education professionals and the broader community being evident. Its function is not to be decisive nor least of all dogmatic about the positions proposed but, rather, to play its part in ensuring that the many issues of significance that lie within the education domain continue to receive the amount of attention they warrant. In particular, the intention behind the writing of the paper was an implicit challenge to any lingering conceptions that teaching is a profession not worthy of high status and regard. The paper proposes strongly that it is a profession of high status, attempts to construct the case and provide the evidence, and to identify the ways in which such teaching can be maintained and enhanced in the future.

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Age profiles and cohorts: understanding the teaching workforce

Barbara Preston

Barbara Preston Research barbara.preston@netspeed.com.au

Barbara Preston has been investigating the teaching labour market at various times over more than two decades. Since the early 1990s, she has prepared a number of teacher supply and demand reports for the Australian Council of Deans of Education, the most recent in 2000. She has also published on aspects of professional practice, standards, regulation and education – for teaching and other professions. In 2002 she completed a report on the development and application of a model for nurse supply and demand projections for the Australian Council of Deans of Nursing. She is a member of the Australian Health Workforce Advisory Committee (AHWAC) nurse workforce planning reference group.

Introduction

Consideration of age profiles (past, present and projected into the future) is crucial for policy-useful understandings of future teaching workforce needs – both qualitative and quantitative.

In this paper I consider age profiles and cohorts of teachers in reference to supply and demand projections and aspects of the quality of the teaching profession and its work. In doing so I will make some reference to the recently published report of the Ministerial Council for Education, Employment, Training and Youth Affairs (MCEETYA), *Demand and Supply of Primary and Secondary School Teachers in Australia* (2003a & 2003b).

Wherever a profession's recruitment rates fluctuate greatly from one decade to another, age profiles are essential in understanding many aspects of that workforce. This is especially so for occupations with a large proportion of female members and/or where more than a small proportion move on to other occupations during their working lives.

Teachers, like many other occupations dependent on public sector funding or associated with children, experienced great fluctuations in recruitment rates over the past half century. For teachers, teacher educators, nurses and others there were particularly high rates of recruitment around the 1970s, and very low rates of recruitment around the early 1990s. Thus, the age profiles for those occupations are very different from that of the general Australian workforce. This is clear for teachers from 1996 Census data in Table 1.¹ For the Australian workforce as a whole there is little difference in the proportions in each of the five five-year age ranges from 25 to 50, while in the teaching workforce the size of the 40-44 cohort was almost twice that of the 30-34 cohort. The large teacher cohort in their early 40s is, of course, those mostly recruited in the 1970s when school enrolments were burgeoning

and staffing levels were being improved at an even higher rate. The small teacher cohort in their early 30s reflects both fairly low recruitment levels in the early to mid 1980s (there were lower levels of recruitment a decade later), and the generally reduced numbers in that age range as many women take some time out of the workforce to care for children.

Table 1. Age profile of teachers, and all in the Australian labour force aged 25 to 64, 1996

	Teachers %	All in labour force %
25-29	13.4	16.1
30-34	12.4	15.9
35-39	18.1	16.6
40-44	22.4	15.9
45-49	17.5	15.0
50-54	10.3	10.6
55-59	4.7	6.8
60-64	1.3	3.2

Initial teacher education commencement numbers also fluctuated substantially, with completions lagging a little behind need. Thus, commencement numbers around 1975 were 50 per cent greater than they were half a decade earlier, and then declined by 50 per cent over the next decade (Preston, 2000, p. 19). Though there have been increases since the mid 1990s, the 1975 level has not again been reached. Thus, there is a marked peak in the age profiles of both those working as teachers and in the population of people with teaching qualifications.

Before looking at the particular developments in the Australian teaching workforce, I want to explain how net separation rates vary with age. This variation occurs whatever the actual age profile may be in teaching at any time, though it is not such a policy-important matter if the age profile is fairly flat. But it is central to understanding teacher workforce developments over the past half century and over coming decades.

¹This and other data is from Australian Bureau of Statistics Census custom tables for the year (or years) indicated unless another source is specified. This paper draws on analyses carried out by the author before 2001 Census data became available.

Age profiles and net separation rates

The Report of the Review of Teacher Education, New South Wales (Ramsey, 2000a & 2000b) recommended that the New South Wales Government advocate within MCEETYA changes to the work being done on projections of teacher supply and demand. The reviewer commented in the Executive Summary, immediately before the relevant recommendation (Recommendation 11):

The evidence indicates that substantial collaborative work involving university vice-chancellors, advised by their deans of education, and government and non-government school authorities is required. This work should refine the assumptions underlying the ACDE model so that teacher supply and demand can be more accurately projected. (Ramsey, 2000b, p. 21)

Probably the most methodologically significant aspect of the ACDE model (Preston, 2000) is the estimation of future net separation rates using (a) projected age profiles for the teaching workforce (primary and secondary, each State and Territory) and (b) estimated underlying net separation rates for each five-year age range (primary and secondary separately, but the same in each State).

The age-specific net separation rates were primarily derived from ABS Census data on the populations with primary or secondary teaching qualifications, whether teaching or not, by age. 'Net separation' rates derived in this way take account of all entry into the teaching workforce other than recent graduates (including returnees from extended leave, re-entry of those who previously left teaching, and normal movements of teachers from overseas and interstate) as well as all exits (including resignations, non-renewal on completion of contract term, cessation of casual employment, retirements, and the taking of extended leave).²

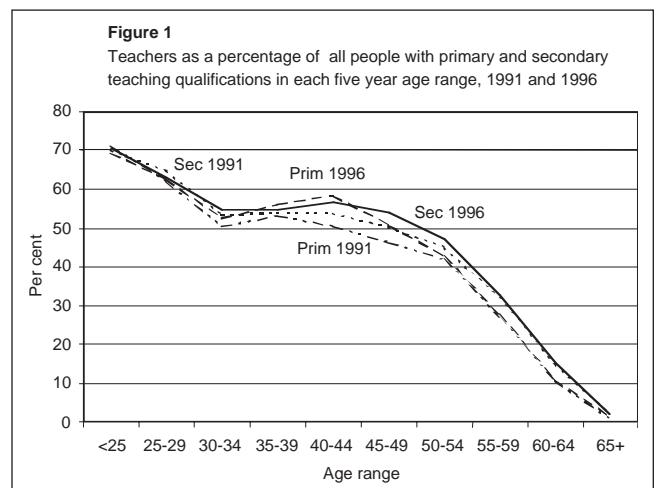
The MCEETYA work apparently took no account of this aspect of the ACDE model. It did consider age profiles (especially in a complementary research paper, 'Implications of the aging of Australia teaching workforce for teacher supply'³ – MCEETYA, 2003b), but the only conclusions relevant to the teaching workforce that were drawn concerned retirements. Not surprisingly, the discussion in the main report (MCEETYA, 2003a) of non-retirement separations canvassed a very wide range of possible rates, and there were no clear preferred projections.

Age profiles are usually the major factor in overall net separation rates of the teaching workforce, and thus in

the demand for replacement teachers. It is not just retirement of teachers over 50 that's important. Young, beginning teachers generally have very high net separation rates (though support for beginning teachers on the one hand, and alternative employment opportunities on the other, can be important); women from around their late 20s to mid 30s often leave for family reasons, and both men and women may temporarily leave for travel or study around this age; those around their mid 30s to early 40s have very low or even negative net separation rates as returnees and re-entrants outnumber those leaving. This pattern is clearly illustrated by Australian Bureau of Statistics 1991 and 1996 Census data on the population of individuals with primary or secondary teaching qualifications, whether or not they are in the school teaching occupation, by age (Table 2 and Figure 1, based on the same data).

Table 2: Teachers as a percentage of all people with primary and secondary teaching qualifications in each five year age range, 1991 and 1996

	Primary teaching qualifications		Secondary teaching qualifications	
	1991	1996	1991	1996
<25	71	69	70	71
25-29	62	63	65	63
30-34	50	52	53	55
35-39	53	56	54	55
40-44	50	58	54	57
45-49	46	51	50	54
50-54	42	43	45	47
55-59	27	28	32	32
60-64	11	11	15	15
65+	1	1	2	2



An underlying net separation rate for each age range can be estimated from this data by comparing the percentage in an age range with the percentage in the immediately younger age range. There may need to

²There may be some other specific categories such as the results of planned overseas recruitment campaigns, or surpluses or shortages carried over from previous years.

³'Aging' can be a misleading notion. As retirements become more significant the workforce as a whole will be becoming younger, not aging. Similarly, 'average age' can be misleading. As the peak in the teaching workforce becomes older, the average age becomes younger. Soon the average age will be in the age range with the fewest number of teachers.

be account taken of particular factors, such as periods of graduate oversupply, or retrenchments. However, the similarities between 1991 and 1996 indicate that even significant events such as the early 1990s recession, retrenchments and graduate oversupply do not have a sustained impact on net separation rates.

A substantial reduction in the percentage of those with teaching qualifications who are teaching indicates a high separation rate for the younger age ranges.⁴ An increase between the 30-34 age range and the 35-39 (or 40-44) age range, as occurred in both 1991 and 1996 for individuals with both primary and secondary qualifications, indicates a negative net separation rate for the relevant age range or ranges. The decreases between the age ranges then become larger as retirement occurs. The slopes of the curves in Figure 2 indicate the very different estimated net separation rates for each age range.

Estimated net separation rates that were used for the teacher demand projections in Preston (2000) were derived from this data (averaging 1991 and 1996, and making some necessary adjustments at the youngest and oldest ages). They are set out in Table 3.

Table 3. Estimated underlying annual net separation rates for Australian primary and secondary teachers in each five year age range

	Primary %	Secondary %
< 30	4.4	4.0
30-34	3.6	3.1
35-39	-1.3	0.0
40-44	0.0	-0.4
45-49	2.1	1.2
50-54	2.6	2.3
55-59	17	17
60-64	19	19
65+	90	90

Waves of the past, present and future

In this section I will outline the changing age profile of the Australian teaching workforce.

Teacher numbers almost doubled over the two decades from the mid 1950s. Thus, the proportion of teachers under 30 remained high – it was about half of all teachers by the early 1970s. The 1970s were years of extraordinarily rapid growth in the total number of teachers, primarily because of improvements in

staffing levels. Then the growth in teacher numbers slowed, and the numbers of new recruits fell sharply.

The very large cohort recruited around the 1970s has not since been matched, and that cohort continued to numerically dominate the profession as it aged. It will continue to so dominate for around a decade.

The age profiles of the Australian teaching workforce from 1954 to 1996 and projected to 2011 are set out in Table 4 and Figure 2.

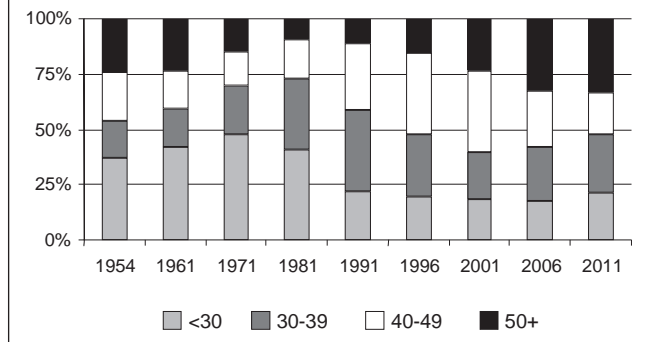
Table 4. Percentage of Australian teachers in ten year age ranges, 1954 to 2011

	<30 %	30–39 %	40–49 %	>50 %
1954	37	17	22	24
1961	42	17	17	23
1971	48	22	15	15
1981	41	32	17	9
1991	22	37	30	11
1996	20	28	37	16
2001	18	21	37	24
2006	18	24	25	33
2011	21	27	19	33

Source: Australian Bureau of Census data for years to 1996. Projections for subsequent years by the author, using the method set out in Preston (2000), pp. 35-36

Figure 2

Percentage of Australian teachers in ten year age ranges, 1954 to 2011



The most striking features are:

- the very different proportions of young teachers in the whole of the period to 1981 compared with the whole of the period since;
- the currently rapidly diminishing proportion of teachers in their 40s – it is projected to fall from almost 40 per cent in 1996 to less than 20 per cent in 2011;
- the high proportion projected to be over 50, even if there is no change from the retirement patterns of the recent past.

⁴It is in fact higher than the Census data indicates because that data is collected in August, and employment in the preceding week is what is taken into account. Thus, those who had been teaching but left before the end of July (or were not teaching in the week before Census day) are not counted as teachers. Later discussion referring to Graduate Careers Council data further considers these issues. Methodologically the important matter is to ensure consistency between assumptions about availability of graduates and net separation rates in the early years. If someone teaches for a week and leaves it is not of great importance whether or not they are considered to have taught. What is important is that if they are counted as entering the teaching workforce they are *also* counted as having left it. Similarly, for graduates who do not enter the teaching workforce for a few years: if they are not counted as 'recent graduates' they should be included in another category such as negatives in 'net separations'.

Projecting net separation rates for primary and secondary teachers in the States

Five-year age range projections provide for finer analysis than the ten-year ranges just discussed. Such projections for primary and secondary teachers in each State were used in Preston (2000) to estimate the net separation rates for the total primary and secondary teacher workforces in each State to 2005. The net separation rate for each age range (see previous) was applied to the number of teachers in each projected range in 2005 (and other years), and the resulting number of separations was applied to the total number of teachers to get the net separation rate for that year. (Detailed calculations for the nursing workforce using the same method are set out in Preston 2002a, Appendix C.)

The patterns in the projected age profiles vary between the States and primary and secondary levels, and thus projected net separation rates vary. Comparing 2000 and 2005 net separation rates for secondary teachers in Queensland and South Australia illustrates this. South Australia had very high levels of recruitment in the 1970s and low levels of recruitment since (primarily because of low student enrolment growth). Thus, in 2000, South Australia had a very large proportion of the teaching workforce in the relatively low separations late 40s age range, and a small proportion in the relatively high separations under 30s. The net separation rate was thus estimated at a fairly low 3.4 per cent. By 2005 the leading slope of the peak in the age profile will be moving well into the common retirement ages, and more beginning teachers (with their higher net separation rates) will be recruited. The net separation rate is thus projected to increase quite sharply to 4.8 per cent by 2005. In contrast, Queensland has a flatter age profile because of continuing recruitment through the 1980s and 1990s in response to enrolment growth. In 2000, the net separation rate was estimated to be higher than that of South Australia at 3.6 per cent (primarily because of a higher proportion of younger teachers). But in 2005, the Queensland net separation rate is projected to be only 4.1 per cent because a small proportion of Queensland's secondary teaching workforce will be entering the common retirement age.

Understanding the 1990s so we can better anticipate the future

In the rest of this paper I will expand on the quantitative and methodological matters above to consider developments during the 1990s and speculate

about the coming period. I am not going to discuss actual projections of teacher supply and demand: I have not prepared projections since Preston (2000), and MCEETYA (2003a) does not provide matching projections of supply and demand as such. However, I will assume a generally tight teaching labour market.

From around the late 1980s to the late 1990s a number of factors converged, resulting in very low recruitment rates:

- a slowdown in school student enrolment growth (especially in the government sector)
- a slowdown in improvements in staffing levels (even reversal in the government sector in some States, though improvements continued in the non-government sector)
- economic recession resulting in reduced alternative employment opportunities for teachers and thus reduced resignations and thus need for replacement teachers
- the large 1970s-recruited cohort was aged around late 30s and early 40s – the age of low and negative net separation rates because more are returning to teaching than leaving.

This last factor was very important, probably being more important than the recession in reducing net separation rates. Of course the factors varied between the States, and their impact on the teaching workforce varied between school sectors, regions and individual schools.

The low demand for new teachers was combined with relatively high graduate numbers in most States – the very large reductions in teacher education intakes arising out of the amalgamations associated with the creation of the 'unified national system' had yet to occur, though numbers had reduced substantially since the high points of the 1970s.

There were thus very large surpluses of graduates seeking teaching positions and/or former teachers seeking to re-enter.

These surpluses were reflected in the results of the annual Graduate Careers Council Graduate Destination Survey (GCCA, 1996 & 2002). In 2002 compared with 1995: A much higher proportion of teacher education graduates teaching in schools, and a much lower proportion were seeking full time employment (Table 5).⁵

⁵Interestingly, relatively few 2001 graduates were working in non-government schools. This may reflect the phenomenon, commented on by Gregor Ramsey in his review of teacher education in NSW, of the non-government sector being in a strong position in the teaching labour market, and being able in 2002 'to recruit teachers after they have had a few years' experience in the government system' while in 1995 they could 'take their pick of the very best young graduates' (Ramsey, 2000a, p. 182). the phenomenon, commented on by Gregor Ramsey in his review of teacher education in NSW, of the non-government sector being in a strong position in the teaching labour market, and being able in 2002 'to recruit teachers after they have had a few years' experience in the government system' while in 1995 they could 'take their pick of the very best young graduates' (Ramsey, 2000a, p. 182).

Table 5. Percentage of graduates of primary and secondary initial teacher education programs in or seeking full time employment, who were working in schools or were seeking full time employment, 1995 and 2002*

	Primary initial teacher education	Secondary initial teacher education
1995		
Govt	39.0	42.3
Nongovt**	17.5	19.1
Total schools	56.6	61.4
Seeking full time employment	31.8	27.8
2002		
Govt	74.2	79.5
Nongovt**	2.0	2.4
Total schools	76.2	81.9
Seeking full time employment	18.1	11.5

*Course completed the previous year, the survey usually carried out around April the year after completion.
 **The non-government school category is not clearly defined, and the data may be overstated.
 Source: GCCA 1996, p. 48 (Education); GCCA 2002 (Education, Initial Training)

In 2002, 93 per cent of both primary and secondary teacher education graduates who were in full time employment were working in schools. This gives some indication of the (minimum?) proportion of recent graduates who would be *available* for teaching positions – for some, after further study or other activities. In Preston (2000) the assumption through to 2005 is generally 80 per cent availability/suitability of recent graduates. In MCEETYA (2003) the assumption is for 70 per cent availability (p. 76). Both assumptions may be too low, though the exact proportion assumed is less important than the requirement for it to be complementary with the assumed net separation rate for beginning teachers. The GCCA data does indicate the inappropriateness of deducing a rate of graduate *availability* for the future from the actual employment situation of graduates in a period of oversupply, when the low rate of graduate recruitment to teaching positions is a reflection of the lack of positions, rather than of low levels of graduate availability for positions that might arise.

Similarly, the high level of availability of qualified teachers *other than recent graduates* through the 1990s should not be assumed to indicate the future level of availability of such people. There are two reasons, noted above, why such people were available in large numbers through the 1990s, creating ‘pools’ and ‘lists’ that seemed effectively unlimited in some jurisdictions. First, around the early 1990s the peak in the age profile was around the 35-44 age range, when the underlying net separation rate is very low or negative as many who had left teaching earlier return. Second, there was a general over-supply of applicants for teaching positions. Thus, there was a cumulative effect when

many of those who could not obtain positions remained available from one year to the next. As that high rate of re-entry occurred and those ‘pools’ were created in particular circumstances during the 1990s, the levels of availability of non-graduates apparent at that time should not be assumed to occur in the near future. The proportions of the teaching workforce in the 35-44 age range will indicate an expected magnitude of net separations that takes account of returnees (though it cannot say exactly how many are exiting and how many non-graduates are entering – only an estimate of the net figure). In addition, any lingering ‘pools’ can also be taken into account – as the ‘surplus carried over from previous year’ in Preston (2002a), pp. 5-6, 38-39, and less explicitly in the figure for the proportion of new recruits who are recent graduates, rows 10-11 in Preston (2000), pp. 36-37.

The MCEETYA (2003a) work had difficulties developing useful estimates for supply other than recent graduates. There was great uncertainty and poor data quality in the general discussion (pp. 59-65), and the report concluded with a flawed assumption that a figure based on reports from school authorities for the recent past can be adequate for projections into the future (p. 77). (This assumption was for 30 per cent of new teachers to be other than recent graduates.) These practical and methodological difficulties would have been largely avoided by using the net separations rate method described earlier to account for underlying levels of those other than recent graduates who are entering (or re-entering), and the separate accounting of any cumulative surpluses.

The very different experiences of three cohorts

Adding some other factors to this outline, the characteristics and experiences of three cohorts of teachers can be charted (Table 6). Cohort 1 is the large cohort now aged around 50 who have numerically and professionally dominated teaching since the 1970s. Cohort 2, now aged around late 30s, is half the size of cohort 1 and has been in its shadow. This cohort entered teacher education and teaching at the nadir of the profession’s community esteem, and received little support from school authorities. As cohort 1 moves into retirement, cohort 2 will be expected to take on the leadership positions in schools, systems and teacher organisations. There are already difficulties in the recruitment of school principals, and over the next decade almost two thirds of education faculty academics will need to be replaced as they move into retirement (Preston, 2002b). Thus, cohort 2, which has been given so little support and attention, will become the most precious and sought-after group. Given the demands that will be on this small cohort, those following after (cohort 3) then may be given great opportunities.

	Cohort 1. <i>Currently late career (aged late 40s and early 50s)</i>	Cohort 2. <i>Currently mid career (aged in their 30s to early 40s)</i>	Cohort 3 <i>Currently beginning and early career (aged to late 20s)</i>
<i>Cohort size</i>	Very large – when in their 40s they were almost 40% of the teaching workforce.	Very small – when in their 40s (in 2011) they are projected to be less than 20% of the teaching workforce.	Medium size – uncertain final size because current new recruits are entering this cohort.
<i>Initial teacher education</i>	Late 1960s to late 1970s. High student demand for an expanding number of places. Teacher educators often inexperienced, but enthusiastic. Teacher education students often well-supported financially (bonded scholarships, etc).	Mid 1980s to mid 1990s. Low student demand (low TER scores). Teacher education unsupported by the Commonwealth and in universities. Low morale of teacher educators, retrenchments, rationalisations, disruption.	Late 1990s to mid 2000s. High student demand for places (higher TER scores), some over-enrolment. Greater support for teacher education and more stability.
<i>Recruitment and beginning teaching</i>	Late 1960s to early 1980s. Large number of new recruits every year. Shortage of applicants. Placement in difficult situations with a high proportion of inexperienced teachers was common. Introduction of registration boards.	Mid 1980s to mid 1990s. Relatively small number of new recruits every year. Surplus of applicants. Beginning teachers employed as casuals or on short term contracts. Little support or effective induction. Community esteem for teachers very low – for example, in 1985 just 54% of Australians rated school teachers very high or high for ethics and honesty (Roy Morgan Research 2002)	Late 1990s to late 2000s. Most able to obtain suitable teaching positions, with improving support for beginning teachers. But many entering workplaces with marked age-bifurcation (a large number of teachers over 50, a large number of beginning teachers, and few in between). Community esteem for teachers high – for example, in 2002 79% of Australians rated school teachers very high or high for ethics and honesty.
<i>Early to mid career experiences</i>	Mid 1970s to mid 1980s. Initial high levels of responsibility as young teachers at a time when schools were in dynamic change and expansion. Group as a whole assumed leadership within the profession (professional associations, teacher unions, school-level committees, community organisations).	Late 1980s to early 2000s. Fewer opportunities for responsibility and leadership as there were large numbers of older and more experienced teachers. As a relatively small group, the cohort as a whole had difficulty wielding influence.	Through 2000s. For many there will be opportunities (or demands) for responsibility and initiative, especially for those in schools with very high proportions of beginning teachers and few mid career (Cohort 2) teachers. Group as a whole may be able to take on professional leadership while still quite young. This cohort may be able to make the significant cultural-professional shifts made by Cohort 1 in their early-mid careers.
<i>Mid to late career experiences</i>	Mid 1980s to mid 2000s. The older teachers in the cohort had early and excellent opportunities for promotion and leadership. Others experienced a bottleneck because of the large numbers in the cohort. Professional development opportunities and salary restructuring around the early 1990s were focussed on maintaining their commitment and competence in those circumstances.	Early 2000s to mid 2010s. Excellent promotion and career development opportunities are developing for the group as a whole – in schools, as Education academics and in a wide range of occupations as earlier cohorts move into retirement.	From mid 2010s. Probably early and excellent opportunities for formal leadership (promotion), especially for the older (more experienced) members of the cohort because of the relatively small size of the preceding cohort.

Changing age profiles and the different circumstances and characteristics of cohorts have many policy implications for the teaching profession, school authorities, and other stakeholders. Some include:

- The age-bifurcation of the teaching profession does not necessarily mean professional bifurcation, but effective strategies are needed to ensure socio-cultural and professional gaps between the old (cohort 1) and young (cohort 3) are bridged. Beginning teachers need to be included and supported; teachers under about 40 (cohorts 2 and 3) need to have appropriate professional development, leadership opportunities, and places on the platform, in the sun and in the public eye well before cohort 1 leaves the workforce.
- Severe problems of age-bifurcation, or concentrations of old or very young teachers, can be avoided. Schools and systems that are weak in the teaching labour market need to be actively supported to improve the qualitative mix of teachers as well as avoid or ameliorate any general or specialist teacher shortages.
- Retaining older teachers who would otherwise have left teaching may be a counter-productive solution to teacher shortages, even if just short term. Even with a continuation of recent retirement-age patterns, teachers over 50 are projected to make up about one third of the teaching workforce in a few years (by 2006), and this is likely to continue for some time (to around 2011). In some States the projected proportions over 50 are much larger, and some systems and schools will have the strength in the teaching labour market to ensure adequate proportions of mid career and younger teachers, so in other systems and schools the proportions over 50 will be much more than a third. A teaching workforce even more numerically dominated by teachers over 50 is unlikely to be a personally or professionally attractive workplace for many young beginning teachers.
- 'Standards for the teaching profession' should not just be concerned with the attributes of individuals (appropriate for formal and informal assessment of individuals for purposes such as registration, employment, deployment, promotion and individual decisions about professional and career development), but should, for many purposes, cover the collective, collegial and collaborative work and potential of the profession. There should also be more attention to the patterns and mixes of individual attributes well beyond the mix of formal subject specialisations and formal leadership roles.

This paper has barely touched on the quantitative and qualitative issues for the teaching profession and its work arising from changing age profiles. However, I hope it has broadened the agenda beyond 'aging' and retirement rates.

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3. Closing address

Using research to advance professional practice¹

Geoff N. Masters

Chief Executive Officer, Australian Council for Educational Research

A profession is a disciplined group of individuals who adhere to ethical standards and uphold themselves to, and are accepted by the public as possessing special knowledge and skill in a widely recognised body of learning derived from research, education and training at a high level, and who are prepared to exercise this knowledge and these skills in the interest of others. (Australian Council of Professions 1997)

Specialised, high-level knowledge and skill are distinguishing characteristics of every profession.

Quality in professional practice – whether as an engineer, accountant or orthopaedic surgeon – depends on expert knowledge of the field, a deep understanding of underlying principles, accumulated experience in the practice of the profession, a familiarity with recent advances in the professional knowledge base, and mastery of the best available techniques and tools.

Teaching qualifies as a ‘profession’ to the extent that it requires the application of specialised knowledge and skill developed through research and high-level education and training. Quality in teaching practice depends on a familiarity with, and an ability to apply, expert knowledge and skill to achieve improved student learning outcomes.

The ultimate goal of teaching is the improvement of learning outcomes for students; in other words, the ‘others’ in whose interests teachers work are learners. Semple (2001) points to the research evidence showing a strong correlation between the quality of teaching and the quality of student learning. In his article ‘The Impact of Teaching on Student Learning’ Cuttance (2001) makes the same point:

The evidence that a substantial proportion of the variation in student learning outcomes is associated directly with variation in teaching has been well documented for almost two decades.

If, by definition, improvements in teaching quality are improvements that result in enhanced student learning, then the important question becomes one of what teachers need to know and be able to do to improve learning outcomes. What is the nature of teachers’ expert knowledge?

Borko and Putnam (1995) present a framework for thinking about the professional knowledge base of

teaching and argue that changes in teaching practice (and hence improvements in teaching quality) depend on the expansion, enrichment and elaboration of teachers’ knowledge systems. They identify a number of categories of professional knowledge, based loosely on the earlier work of Shulman (1987).

General pedagogical knowledge

Quality teaching depends on the ongoing development of teachers’ general knowledge and beliefs about teaching, learning and learners. This includes the development of teachers’ understandings of what it takes to create learning environments and to effectively manage classrooms, as well as their understandings of and beliefs about learners, how they learn, and how learning can be supported by teaching. These professional understandings and beliefs transcend particular subject matter domains and stages of schooling.

Subject matter knowledge

Quality teaching depends on the ongoing development of a teacher’s conceptual understanding of subject matter. Borko and Putnam (1995) point to research suggesting significant relationships between teachers’ grasp of subject matter and their teaching practices. The development of subject matter knowledge includes the development of teachers’ knowledge of the facts, concepts and procedures within a discipline and the relationships between them, as well as teachers’ understandings of the explanatory frameworks that affect the organisation of content knowledge and the questions that guide further inquiry.

Pedagogical content knowledge

Quality teaching depends on the ongoing development of a teacher’s:

- (i) conception of what it means to teach a subject matter – a conception compatible with current thinking within the discipline;
- (ii) knowledge of effective ways of organising and presenting subject matter, including the use of models, examples, metaphors, simulations and demonstrations;
- (iii) knowledge of how students learn particular

¹A version of this paper was first published in *Unicorn*, the journal of the Australian College of Educators.

- subject matter, including their common preconceptions and misconceptions; and
- (iv) in-depth knowledge of available curriculum materials and about how local curricula are organised and structured.

Beyond this, quality teaching also depends on a knowledge of individual students, their learning histories, backgrounds and interests, and an expert knowledge of the special circumstances and challenges faced by particular groups of students (for example, particular cultural or language groups).

As Kennedy (2001) points out, issues of teaching quality can be addressed both at the level of the profession and at the level of individual practitioners. The professionalism of teachers can be enhanced by securing greater autonomy, authority (for example, self-regulation and self-policing) and control (for example, over training, certification and licensing arrangements) for the profession itself. But attention to these 'structural' elements of the profession needs to be complemented by attention to Kennedy's 'personal' dimension of quality: the development of individual teachers' expert knowledge, skills and beliefs.

Research and recent experience suggest several general strategies for enhancing teaching effectiveness/quality:

1. Place student learning at the heart of professional learning.
2. Make explicit what we know about effective teaching practice.
3. Disseminate and share professional knowledge.
4. Recognise and reward high-level knowledge and skill

1. Place student learning at the heart of professional learning

The central objective of teaching is to facilitate and support student learning (that is, to develop individuals' knowledge, skills, understandings, attitudes and values). Quality teaching depends on expert knowledge about the best ways of doing this.

2. Make explicit what we know about effective teaching practice

What do we know about what teachers need to know and do (including their general pedagogical knowledge, subject matter knowledge, and pedagogical content knowledge) to support student learning? How do we capture, share and communicate this professional knowledge? Standards for the teaching profession must identify the professional values and expert knowledge and skills that underlie quality teaching and provide a framework for describing and monitoring growth

towards outstanding teaching practice (Ingvarson, 1998). Teaching standards should be informed by professional practice and experience, and by the results of research into teaching practices that have a significant impact on student learning. As Cuttance (2001) observes, schools at the leading edge of performance can gain substantial leverage from harvesting and incorporating advances from the research literature into their learning and teaching processes.

Importantly, teaching standards must recognise the importance not only of general pedagogical knowledge, but also of subject matter knowledge and pedagogical content knowledge for expert teaching. Generic standards describing the general pedagogical knowledge required of all teachers are necessary, but not sufficient – any more than a set of generic standards that excluded expert subject knowledge would be sufficient across all medical specialties. This is a point that Boston (1999) also has made:

We should go beyond generic statements of professional teaching standards, and contextualise them within the particular subject or curriculum areas and the specialist requirements of particular schooling contexts.

The work currently being undertaken by the Australian science, mathematics and English teacher associations to develop professional teaching standards that recognise the importance of subject matter knowledge and pedagogical content knowledge is an important step in this direction.

3. Disseminate and share professional knowledge

A third general strategy for enhancing teaching quality is the development of improved methods of disseminating and sharing what we know as a profession. As Semple (2001) notes:

Even with the knowledge we now have available to us through research on teaching and learning, its dispersal or transmission is a problem. There may be consensus among 'experts' but the knowledge is not widely shared throughout the profession. (Semple, 2001)

The sharing of expert knowledge about effective teaching practices will require an approach to teacher professional development rather different from the professional development to which teachers commonly have been exposed. In contrast to many past professional development programs which have not had an explicit focus on teaching practices (Cuttance, 2001), professional development to support quality teaching must be focused on knowledge and skills with the demonstrated potential to improve teaching and student learning.

The sharing of expert knowledge also will be enhanced by the creation of contexts in which teachers are supported and encouraged to develop and share their knowledge. Teacher professional associations having a particularly important role to play as leading-edge knowledge organisations in this exchange (Kennedy, 2001).

And, most importantly, the study and analysis of student work must be at the heart of efforts to improve the quality of teaching. The evaluation and discussion of student work – the analysis of teaching successes and failures, student insights and misunderstandings – are key vehicles through which teachers develop the specialised knowledge and skill that they can apply in their professional work.

4. Recognise and reward high-level knowledge and skill

Finally, quality in teaching is likely to be enhanced by the introduction of mechanisms for recognising and rewarding expert professional practice. Rigorous procedures for assessing teachers' abilities to apply high-level knowledge, understandings and skills in their day-to-day practice are required if systems of professional certification are to be accepted as credible and fair. The assessment procedures of the US National Board of Professional Teaching Standards, with their use of structured portfolios of classroom evidence and separate assessment centre exercises, provide a valuable model here. Assessments will be most useful when they provide evidence of teachers' mastery of general pedagogical knowledge, subject matter knowledge and pedagogical content knowledge, and of their abilities to apply this expert knowledge in their professional practice.

Greater clarity about the expert knowledge, beliefs and skills underpinning accomplished teaching not only has the potential to raise the status of teaching as a profession in the eyes of the public, but also is a key to raising the quality of teaching practice in the interests of improved student learning.

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4. Notes for the Plenary Panel Session

How does current research on teacher quality connect to the work of policy makers? What are the gaps in the research? Viewpoints from national and state perspectives.

Jo-Anne Reid,

Head, School of Teacher Education, Charles Sturt University, NSW

President, Australian Teacher Education Association

Back in 1901, the teachers in one mainland Australian State were described as the 'least educated in the English-speaking world' (Saunders, 1976). As Federation brought together six British colonies as one Australian nation, it is significant that the new Federal Government did not see policy on the welfare or education of its children as its concern in any way. Jurisdiction over education, health and child labour conditions were the responsibility of each individual State. The job of schooling the new nation and educating a citizenry that would allow it to 'take its place on the world's stage' has remained tied to State systems implementing national economic and social priorities and policies ever since.

And since even before Federation, the people charged with this responsibility – Australian teachers – have regularly been vilified in Parliament, the Press and in public discourse as inadequate. They have been denigrated as lacking quality, in need of development, reform, and improvement. As Saunders said in 1976, on the occasion of the centenary celebrations of Adelaide CAE, 'one of the paradoxes of education is that parents have been so prepared to hand over their children to the care of persons they openly despise' (p. 5). What I want to do in this session is to explore that paradox a little further in the hope of expanding our understanding of this most recent iteration of the teacher quality debate that has characterised education in Australia since Federation (Green, Reid & Cormack, 2000).

I want to look back to the history of teacher education in Australia, to illustrate the difference between what Wagner (1993) calls 'blank spots' and 'blind spots' in our construction of knowledge. Blank spots are the gaps of the picture that we think need to be 'filled in' by further research. To fill in blank spots we do not need to change or question the existing picture at all. Research that fills in 'blank spots' or gaps does not challenge existing constructions or values – it remains within the frame of the big picture it sees as representing reality and truth. In order to generate new knowledge, however, Wagner (1993) claims, 'educational researchers must begin with ignorance, not truth' (p. 15). In this way, some of the 'blind spots' we have in our educational vision are more likely to demand our attention. Sometimes, indeed, we might be taken by surprise by having a look at somebody

else's picture of normality and truth. Using the work of Bakhtin to complicate the picture, we need to ask ourselves: What is the policy question that current research on teacher quality is aiming to answer?

What is wrong with the quality of Australian teachers, and why has teacher quality never been good enough? Our history can help us answer this question. As President of ATEA, I represent the large number of teacher educators who are currently teaching, researching and reforming teacher education in ways that are always congruent with our history, whether we understand this or not. I believe that we need to start from a position that recognises an 'ignorance' of our history. It is only through beginning to understand where we have come from that we can ensure we do not remain blind to the assumptions that frame the current teacher quality agenda as a problem that can be solved by research that remains within the frame.

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5. Poster presentations

Poster presentations

Elka Adler

Masada College, New South Wales

Pathways to fundamental change to teaching practice

This poster will examine the use of teacher standards from the USA, case studies and portfolios in an Australian school setting as an alternative to the current professional development approach.

Dean Coley and Ross Brooker

University of Tasmania

Organisational entry into teaching: the role of knowledge acquisition and its relationship with indirect outcome measures in pre-service Health and Physical Education teachers

This project investigated the relationship between pre-service teachers' acquisition of knowledge about their teaching environments and their satisfaction with their internship program, self-efficacy and intention to quit teaching. During organisational entry the proximal work group socialises newcomers into the new organisation and their respective role. A sample of pre-service Health and Physical Education teachers (N = 50) completed questionnaire measures after nine weeks of an internship program. Results showed that pre-service Health and Physical Education teachers acquisition of relevant knowledge about organisation and interpersonal resources predicted satisfaction with the program. Also, knowledge about interpersonal resources predicted intention to quit teaching. The implication of these findings and the importance of developing appropriate mentoring programs for pre-service are discussed.

Lexie Grudnoff and Bryan Tuck

Auckland College of Education, New Zealand

Beginning teacher study

Over 600 beginning teachers and supervising teachers were surveyed and 120 interviewed across first two years of teaching. Findings: tension between learning about teaching and learning while teaching, development from task-driven and trial and error to savvy teaching, critical role of supervising teacher as colleague, significance of integrated professional culture and learning within community school. If professional standards are to be an integral part of practice then teachers need to be involved in the construction of performance standards and assessing standards in their particular context. Discourse on

standard setting and teacher professional growth need to be better integrated. Beginning teachers need to discuss unsuccessful practice with low risk of negative consequences for their career. The process becomes problematic if standard setting is driven by the needs of credential, for example, National Board of Professional Teaching Standards in the USA, or embedded within a system's needs for accountability, for example, OFSTED.

Elizabeth Kleinhenz

Australian Council for Educational Research

Evaluating the Work of Teachers in Australia

This poster will provide:

- a summary history of teacher evaluation in Australia;
- a description of various methods of teacher evaluation used nationally and internationally;
- some criteria for effective teacher evaluation;
- an outline of the main ways in which Australian teachers are evaluated at different career points
- summary of a case study of a school's implementation of Annual Review mandated by the Victorian Department of Education and Training in Victoria

Cecily Knight

Central Queensland University

Teaching 'for' and 'beyond' the knowledge society: Building resilient children

This poster will outline the rationale and content of a new teacher education course designed to promote positive attitudes to mental health promotion. The researcher believes the course develops attitudes, knowledge and skills for future teachers which enable them to be better prepared to develop resilience in children. Resilience is seen as an important life skill that enhances the emotional wellbeing of children and enables them to cope with life. The researcher will argue that this is in fact 'new knowledge' that classroom teachers need if they are to transform education for relevance in the 21st century 'knowledge society'. A teacher education course, which incorporates this 'new knowledge' has been designed and implemented in 2003 in the Bachelor of Learning Management Program. The bachelor of Learning Management is a new degree in teacher education offered by Central Queensland University, Australia. The conceptual framework for the course will be outlined. The effects of the course on the participants are currently being evaluated using a multiple case study methodology. Preliminary findings will be outlined.

Will Morony

Australian Association of Mathematics Teachers

Assessing teachers against the AAMT Standards for Excellence in Teaching Mathematics – a pilot project

This poster will highlight:

- Key components of the AAMT Assessment Model
- The three parts of the national assessments
- The methodology of the project

This project is supported by funding from DEST through its Quality Teaching Program.

Frances Plummer

NSW Department of Education and Training
Commonwealth Quality Teacher Program

Quality teaching in NSW schools

This poster will provide:

- An outline of the model of professional learning to support school teams to engage in a cycle of action learning supported by an academic partner and Commonwealth Quality Teacher Programme funding.
- A description of the dimensions and elements of the NSW model of pedagogy described in the discussion paper.
- A description of the action learning approach taken by school teams.
- Examples of school-based action learning projects in a range of NSW schools.

Carmel Richardson

Australian Council for Educational Research

Monitoring student performance at all levels (student, class/teacher, subjects, KLA) within the school

The ACER Data Interpretation Service (ACER DIS) was developed to address schools' needs for analysis, display and interpretation of student achievement data. This Service allows for individual student results to be displayed against the overall pattern within their class, subject and curriculum area.

Key factors can be taken into account, for example, student and class ability, gender, NESB, age, depending on the data available. Raw (unadjusted) and ability-adjusted (value-added) results are graphed, and access to all data is quick and easy, via drop-down menus. Printed copies can be obtained for individuals and groups. Support is offered to staff to assist them with interpretation, discerning trends over time, and developing positive strategies to meet the teaching and learning needs identified within their school.

The ACER Data Interpretation Service is now being extended to all primary and secondary schools across Australia, to meet the academic monitoring and accountability needs of schools.

Mary Rohl and Helen House

Edith Cowan University W.A

Prepared to teach literacy to all students? Views of beginning teachers, senior school staff and university academics.

In this poster we present some findings from a suite of surveys that sought to discover the views of beginning teachers and senior school staff about their perceptions of the preparedness of new graduates to teach literacy in schools. The findings on teacher preparation for teaching literacy to educationally disadvantaged students and on preparation for teaching specific aspects of literacy will be particular foci. The surveys were conducted as part of a large national project and were funded by the Commonwealth Government as a Literacy and Numeracy Programmes and Strategies Project.

Janette Ryan

University of Ballarat

The development of lifelong and lifewide learning approaches through school and community based projects by pre-service teachers

The poster will showcase work undertaken by second year Bachelor of Education students at the University of Ballarat with schools in the region. Working in teams, pre-service teachers worked in collaboration with local school communities to develop sustainable community-based projects which encompassed lifelong and lifewide learning for primary school students.

Angela Scarino

University of South Australia

Intercultural learning for Culture-and-Language teacher education

The Research Centre for Languages and Cultures Education (RCLCE) at the University of South Australia has undertaken a number of research projects that focus on teacher knowledge, teacher learning and teacher quality in the area of Languages and Cultures. Each project centres on a set of principles for multi-perspective, intercultural language and culture learning.

For this poster display three examples of the research will be provided, each presenting a different dimension of the focus on 'building teacher quality'.

- a. The *Focus-School Project* explored teacher learning through inquiry towards achieving school-culture change
- b. The *Standards-in-Teaching Project* focused on developing standards as a vehicle for professional change.
- c. The *Framework-for-Intercultural-Learning Project* centred on the development of a conceptual framework which facilitates teachers' reflection on multiple pathways for engaging themselves and their learners with/through intercultural learning.

This body of work has led our research team to reflect upon how to 'build teacher quality', on the basis of what principles, frameworks, blueprints, 'architecture' of interculturality, and of what kinds of materials, resources and processes?

Stephen Smith

Central Queensland University

The benefit of a male teacher mentoring program and strategies to raise male school-leaver enrolment in teacher preparation courses.

Outline of the pilot 'MATES' (male teaching experienced support) program, a joint Education Queensland, Central Queensland University and Queensland Catholic Education initiative. Current local and national enrolment data, strategies that have been implemented, achievements so far, future prospects and feedback from stakeholders will be displayed as well as our inaugural teaching promotional video. We will also launch our Australian network promoting male teaching.'

Diane Wasson

NSW Department of Education and Training

The meta-evaluation of the Priority Action Schools Program

Meta-evaluators were Dr Susan Groundwater-Smith and Professor Stephen Kemmis and 54 academic partners from a wide range of universities supporting school level evaluation.

The focus of the research was to evaluate the Priority Action Schools Program, a \$16.1 million trial in 2003 in 74 primary, secondary and central schools with concentrations of students from low socioeconomic status communities across the State. Each school is conducting its own action research, supported by academic partners, to submit to the meta-evaluation.

The Priority Action Schools Program operates under the basic tenets of context-based solutions, building capacity and partnerships. The program aims to improve student engagement in learning and student

learning outcomes, reduce disruptive behaviour and suspensions and improve attendance and retention. It is a joint venture between the NSW Department of Education and Training and the NSW Teachers Federation.

Description of school projects:

Schools receive between \$100,000 and \$400,000 to implement their Priority Action School plans.

Strategies being implemented include:

- improved mentoring and induction programs through reduced teaching time to allow more experienced staff and less experienced staff to work together more intensively;
- reduced class sizes complemented by intensive training and development in literacy, numeracy and technology;
- release/employment of executive staff to lead whole-school pedagogy and student-support training and development as well as improving interagency coordination and community participation;
- employment of additional specialist personnel such as social, youth and attendance workers;
- team teaching of primary and secondary teachers in secondary schools;
- working with academic partners to evaluate their research findings.

Many of these school communities are supported through whole-of-government initiatives. Each school is supported on their learning journey by a PAS support team member.



6. Conference program

SUNDAY 19 OCTOBER

6.00 – 7.30

Opening reception

MONDAY 20 OCTOBER

9.00

Conference opening

Geoff Masters, Chief Executive Officer, ACER

9.30

Plenary address,

Promoting teacher quality in England: the role of the Teacher Training Agency

Ralph Tabberer, Chief Executive Officer, Teacher Training Agency, England

Chair: Lawrence Ingvarson, ACER

11.00

Morning Tea

11.30

Concurrent sessions 1

Session A: Follow the evidence: What counts as quality literacy teaching in the early years?

William Louden, Executive Dean, Faculty of Community Services, Education and Social Science, Pro Vice-Chancellor (Research), Edith Cowan University

Session B: Productive Pedagogy as a framework for enhancing teacher quality, preservice and inservice

Jennifer Gore, Professor, Assistant Dean, Curriculum Teaching and Learning, Faculty of Education and Arts, University of Newcastle

Session C: Building the knowledge base on teachers and teaching: paradoxes, issues, questions and (some) answers

Malcolm Skilbeck, Emeritus Professor, Connell Skilbeck P/L, International Education Consultants, formerly Deputy Director of Education, OECD

1.00

Lunch

Poster displays

2.00

Plenary Session: panel discussion:

How does current research on teacher quality connect to the work of policy makers? What are the gaps in the research? Viewpoints from national and state perspectives.

- *Jo-Anne Reid, Head, School of Teacher Education, Charles Sturt University, President, Australian Teacher Education Association*
- *Georgina Webb, Director, Quality Teaching Section, Schools Group, Department of Education and Science, Canberra*
- *Paul Leitch, Director, Strategic HR, Education Queensland*
- *Chris Cook, Assistant Director, Department of Education and Training, Western Australia*

Chair: Marion Meiers, Australian Council for Educational Research

3.30

Afternoon tea

4.00

Concurrent Sessions 2

Session D: The importance of Teacher Quality as a key determinant of students' experiences and outcomes of schooling

Ken Rowe, Research Director, Learning Processes and Contexts Research Program, Australian Council for Educational Research

Session E: Quality Teaching for Diverse Students in Schooling: Best Evidence Synthesis

Adrienne Alton-Lee, Senior Policy Analyst, Medium Term Strategy Policy Division of the New Zealand Ministry of Education

Session F: Teachers Make a Difference. What is the research evidence?

John Hattie, Professor, Head of School of Education, University of Auckland

5.00

Close of discussion

7.00

Conference Dinner

Dinner address: The Public Take on Teaching

Sue Beveridge, Chief Education Officer, Priority Action Schools, Department of Education and Training, New South Wales

TUESDAY 21 OCTOBER

9.00

Plenary Address

The effects of initial teacher education on teacher quality

Linda Darling-Hammond, Charles E. Ducommun Professor of Teaching and Teacher Education, Stanford University, USA

Live video link and interactive discussion

Chair: Geoff Masters

10.30

Morning Tea

11.00

Concurrent Sessions 3

Session G: Evaluating the quality and impact of professional development programs

*Lawrence Ingvarson, Marion Meiers, Adrian Beavis
Teaching and Learning Research Program, Australian Council for Educational Research*

Session H: The role of the 'Teacher': Coming of age?

*Terence Lovat, Pro Vice-Chancellor (Education and Arts),
The University of Newcastle, Executive Secretary,
Australian Council of Deans of Education*

Session I: Age profiles and cohorts: understanding the teaching workforce

Barbara Preston, Barbara Preston Research

12.30

Lunch and poster display

1.30

Plenary Address

Twelve years with the National Board for Professional Teaching Standards: Reflections of a psychometrician

Lloyd Bond, Senior Scholar, Carnegie Foundation for the Advancement of Teaching, USA

Chair: Lawrence Ingvarson

3.00

Closing address

Using research to advance professional practice

Geoff Masters, ACER

3.30

Close of conference



7. List of delegates

**Dinner
table****Delegate****Organisation**

21	Mirasol Abordo	Novaliches High School, Philippines
	Ms Elka Adler	Masada College, NSW
	Cath Ahearn	St Joseph's College, Vic.
8	Sandra Aikin	NZEI Te Riv Roa Education Institute
7	Prof Noeline Alcorn	The University of Waikato, NZ
11	Paula Allt	Cerdon College, NSW
3	Dr Adrienne Alton-Lee	NZ Ministry of Education
	Mrs Carolyn Anderson	Ruyton Girls' School, Vic.
21	Mr Graham Anderson	William Clarke College, NSW
	Ms Dale Anthony	P.L.C. Sydney
	Tanja Antoun	Elizabeth North Primary School, SA
	Mrs Narelle Archer	Catholic Education Office, Syd
20	Ms Suzanne Bain	Grammar Schools Association Qld
1	Ms Robyn Baker	NZCER
21	Ms Wendy Barel	Masada College, NSW
13	Ms Helen Barnes	Dept. Education & Training, NSW
17	Mr Andrew Batrouney	Canterbury Girls' Sec. College, Vic.
	Mr Andy Bedford	Angle Vale Primary School, SA
	Ms Ros Bell	Education Queensland
	Mr Joe Belousoff	Maranatha Christian School, Vic.
14	Ms Elizabeth Bennett	Santa Sabina College, NSW
	Mr Ian Bentley	Ringwood College, Vic.
17	Mr Rodney Beresford	Curriculum Council of WA
	Ms Michele Bernshaw	The King David School, Vic.
	Ms Carol Bett	OCLL - Tas.
1	Ms Sue Beveridge	NSW Depart of Education & Training
2	Professor Lloyd Bond	Carnegie Found. for the Adv of Teaching
19	Dr Arnold Bonnet	NEITA Foundation, Vic.
	Ms Elizabeth Bourke	Dept. of Education, Tas
11	Mr David Bourne	St Andrew's College, NSW
11	Mr Alan Bowmaker	Central Qld University
	Ms Wendy Bradley	Victorian Institute of Teaching
7	Mr John Brazier	Launceston Grammar School, Tas.
20	Mr Anton Breen	John Calvin Schools, WA
1	Dr Paul Brock	NSW Depart of Education and Training
	Dr Ross Brooker	University of Tasmania
	Mrs Kathryn Bruggemann	Hewett Primary School, SA
	Hon Helen Buckingham	Parliament of Victoria
	Ms Jennifer Buckingham	The Centre for Independent Studies, NSW
5	Mr Peter Bulkeley	Australian College of Educators, ACT
7	Mr Timothy Burgess	Massey University, NZ
20	Mr Paul Burgis	Inaburra School, NSW
23	Ms Ursula Burgoyne	TAFE NSW
12	Mr Barry Burney	Dept. of Educ. & Children's Services, SA
	Ms Elizabeth Burns	Loreto Mandeville Hall, Vic.
16	Mrs Margaret Buttigieg	Cranbourne Christian College, Vic.
	Mr Murray Buzza	West Coast College of Tafe, WA
	Mrs Carmel Byrne	Aspire Training & Consulting Ltd, Vic.
	Dr Brian Cambourne	University of Wollongong, NSW
	Mr Clyde Campbell	Eatons Hill State School, Qld
	Mr Gary Campbell	Auburn South Primary School, Vic.
	Mrs Kathy Campbell	Catholic Education Office, NSW
	Ms Renato Carinci	Copperfield College, Vic.
	Rev Neville Carr	C.C.E.S. - Vic.
19	Ms Judith Carter	Massey University, NZ

14	Mr Grant Casey	South Western Sydney Institute of TAFE
	Mr Thomas Casey	All Saints Anglican School, Qld
	Dr Geraldine Castleton	Bond University, Qld
15	Mr Robert Chandler	The King's School, NSW
15	Mrs Jan Chapman	Massey University, NZ
6	Prof. Judith Chapman	ACU National - Vic.
	Mr Joseph Ciccarone	MacKillop Catholic College, ACT
2	Ms Carolyn Clancy	Victorian Institute of Teaching
12	Mrs Julie Clark	Flinders University, SA
6	Jeanette Clarkin-Phillips	NZEI Te Riu Roa, NZ
16	Mr Paul Colyer	Holy Family Primary, NSW
	Mr Kevin Comber	Catholic Education, SA
	Mrs Carolyn Cook	Darcy Road Primary School, NSW
4	Ms Christine Cook	Dept. of Education & Training, WA
	Ms Rosemary Copeland	St Joseph's College, Vic.
14	Mrs Kay Cortessis	Santa Sabina College, NSW
	Ms Lesley Crawford	Bonython Primary School, ACT
	Mrs Anne-Maree Crivelli	St Helena Secondary College, Vic.
13	Ms Sue Crossman	S.A. Dept. Educ. & Children's Services, SA
	Dr Gregory Cunningham	Barker College, NSW
	Mrs Darralyn Cusack	Carey Baptist Grammar School, Vic.
	Mr Dick D'Aloia	Elizabeth North Primary School, SA
9	Ms Miriam Daley	Dept of Educ & Children's Services, SA
	Mrs Debbie Darvell	St Peter's Primary School, Vic.
8	John DeCourcy	St Andrew's College, NSW
9	Delegat	Professional Teachers Council NSW
	Mr Mark Denver	Copperfield College, Vic.
22	Mr Greg Dickman	Windaree Secondary School, Qld
18	Mrs Sue Dickson	Catholic Education Office, NSW
18	Ms Hilary Dixon	Cranbrook School, NSW
	Ms Vonnie Dolling	Hackham South School, SA
10	Assoc Prof Toni Downes	University of Western Sydney
	Miss Tamara Downey	Pyramid Hill College, Vic.
	Ms Lana Dubrowsky	Hackham West School, SA
20	Mr John Duncan	Gippsland Grammar School, Vic.
	Dr Rod Duncan	New Plymouth Girls High School, NZ
	Ms Therese Dunlop	Noarlunga Downs P-7 School, SA
19	Dr Richard Edlin	Nat. Institute Christian Ed. NSW
	Ms Karen Ellingford	Parliament of Victoria
	Ms Christine Elliott	Dandenong High School, Vic.
	A/Prof Marie Emmitt	Deakin University, Vic.
	Ms Merrin Evergreen	St Leonard's College, Vic.
	Ms Carol Feehan	Avenal Primary School, Vic.
18	Mr Paul Fenson	Trinity Catholic College, NSW
	Mrs Rubi Jennifer Fernandez	Secondary School, Philippines
19	Terry Field	Dept. Premier & Cabinet (Tas.)
	Ms Diane Findlay	Wesley College, Vic.
14	Mrs Karen Fitzpatrick	Salisbury High School, SA
16	Ms Margaret Ford	AISSA - SA
20	Mrs Cathy Forrester	Holy Family Primary, NSW
16	Ms Kathryn Fox	Catholic Schools Office, Newcastle
6	Robyn Fox	Dept. Premier & Cabinet (Tas.)
5	Ms Andrea Frost	Education Review Office, NZ
	Ms Therese Garrahy	St Margaret's Anglican School, Qld
	Mr Richard Geeves	World Education - Cambodia
	Mrs Shiela Gilbert	Canberra Girls Grammar School
	Dr Wendy Giles	Pymble Ladies College, NSW
12	Mrs Debra Gilmore	St Christopher's Primary, NSW

	Mrs Sue Godfrey	St George Christian School, NSW
20	Mr Martin Gooding	Knox Grammar School, NSW
10	Ms Fiona Gordon	Wesley College, Vic.
5	Professor Jennifer Gore	University of Newcastle
	Mr John Graham	Australian Education Union, Vic.
	Mrs Wendy Graham	Ballarat Secondary College, Vic.
	Ms Karen Grant	WA College of Technology
9	Mr Alan Green	Dept. of Education, SA
22	Mrs Louise Green	Macquarie Fields Primary School, NSW
	Ms Christine Grimmer	Royal Inst. for Deaf & Blind Child, NSW
	Ms Lexie Grudnoff	Auckland College of Education
	Mr Stan Hagias	Port Noarlunga Primary School, SA
	Dr Mavis Haigh	Auckland College of Educ.
2	Mr Graeme Hall	Board of Teacher Registration, Qld
	Mrs Sandra Hall	Gordon Primary School, ACT
	Ms Judi Hanke	DET Eastern Metro. Region, Vic.
21	Mrs Michele Hanwell-Short	Inaburra School, NSW
10	Mr Michael Harkin	Brisbane Catholic Education
12	Mr James Harpur	Queenwood School, NSW
	Ms Wendy Hastings	Teachers Registration Board of S.A.
3	Professor John Hattie	University of Auckland
16	Mr Peter Hayes	Catholic Education Office, Perth
	Mr Phill Healy	St Joseph's College, Vic.
	Mr Doug Hearne	University of Wollongong, NSW
19	Mrs Berise Heasley	Aitken College, Vic.
	Mrs Lynette Henshall	Tintern Schools, Vic.
8	Ms Bronwyn Hession	Catholic Schools Office, NSW
17	Ms Cathy Hickey	Vic Independent Educ Union
15	Ms Angela Hill	James Cook University, Qld
	Ms Marie Hird	DEST, ACT
5	Kerry-Anne Hoad	ACER
	Ms Leigh Hobart	Education Qld
	Ms Ngaire Hoben	University of Auckland
5	Mr Michael Hollings	Education Review Office, NZ
10	Ron Holmes	Brisbane Catholic Education
	Mrs Ailsa Holmes-Walker	Professional Teachers Council NSW
	Ms Kathryn Holzheimer	Queensland Studies Authority
14	Mrs Delma Horan	Parramatta CEO
	Mrs Prue Horan	CEO Wilcannia Forbes
	Ms Helen House	Edith Cowan University, WA
	Ms Robin Hull	AEU - Tas. Branch
	Ms Jane Hunter	NSW DET
3	Mr Albert Huts	Dept. of Education & Training, WA
2	Dr Lawrence Ingvarson	ACER
2	Mr Andrew Ius	Victorian Institute of Teaching, Vic.
	Mrs Tricia Jarratt	Hay Distance Education, NSW
13	Mr Kevin Jones	Delany College, NSW
	Mr Matthew Jones	St Finn Barr's School, Tas.
	Mr Rod Jones	West Coast College of Tafe, WA
	Ms Linden Jones-Drzyzga	St Mary's Primary School, NSW
	Ms Susan Just	Ipswich Girls Grammar School, Qld
	Dr Charles Justins	Tyndale Christian School, NSW
	Aengus Kavanagh	Catholic Education Office, NSW
	Mrs Anne Kearney	St Patrick's College, NSW
	Mr Peter Keegan	Loyola College, Vic.
17	Elinor Kenealy	Canterbury Girls' Sec. College, Vic.
15	Mrs Pani Kenrick	Massey University, NZ
1	Mr Stephen Kershaw	Brunel University - UK

	Ms Linda King	NT DEET
19	Mrs Anne Kingsley	Massey University, NZ
	Ms Elizabeth Kleinhenz	ACER
11	Ms Cecily Knight	Central Qld University
	Mr Philip Knight	Parkdale Secondary College, Vic.
8	Mr Rodney Knight	Caulfield Grammar School, Vic.
17	Mr Richard Korbosky	Catholic Education Office, Perth
	Mr Michael Krawec	Patrician Brother's College, NSW
	Ms Jeana Kriewaldt	University of Melbourne
	Mr Keith Kuhlmann	Hackham South Primary School, SA
	Mr Robert Laird	AEU -NT Branch
7	Dr Faye Lambert	St. Michael's School, Vic.
	Mr Scott Lambert	Depart of Educ Science and Training ACT
	Dr Julie Landvogt	Consultant, Vic
12	Ms Josephine Lang	RMIT University, Vic.
23	Genie Larew-Micheletto	ACER
21	Ms Ann Lawless	Knox Grammar School, NSW
	Ms Ina Laybourne	Port Noarlunga Primary School, SA
	Mr Brendan Lea	Queensland Studies Authority
	Ms Mary Leahy	Catholic Schools Office, NSW
18	Mr Stephen Lee	Methodist Ladies College, Vic.
5	Ms Jennifer Leete	NSW Teachers Federation
	Mrs Penny Lehman	Lightning Ridge Central School, NSW
	Mr David Leigh-Lancaster	VCAA
4	Paul Leitch	Education Queensland
	Ms Elizabeth Lenders	Carey Grammar School, Vic.
	Mrs Estelle Lewis	Assoc. of Independent Schools, NSW
	Ms Kathy Liley	Victorian Institute of Teaching
23	Peter Lind	Massey University
6	Dr Jan Lokan	Formerly ACER
	Ms Denise Long	St John's School, Tas.
3	Professor Bill Louden	Edith Cowan University, WA
4	Prof Terence Lovat	University of Newcastle, NSW
	Dr Susan Lovett	Christchurch College of Educ.
	Ms Susan Lubbers	NCELTR, Macquarie University, NSW
16	Ms Christine Lucas	ACT Dept Education, Youth & Family Services
18	Helen Lyne	Monte Sant' Angelo College, NSW
	Tony MacKay	IARTV
2	Pamela Macklin	Curriculum Corporation, Vic.
	Mr Jake Madden	St Joseph's Primary School, Qld
	Mr Frank Malloy	Marist College, NSW
13	Dr Karen Malone	RMIT University, Vic.
	Mr Dean Mann	DET Eastern Metro. Region, Vic.
21	Ms Jenni Mann	Logan Schools for Lit & Learn. Devl QLD
5	Mr Roy Martin	AEU - Vic.
	Mrs Mary Mason	The Geelong College, Vic.
1	Prof. Geoff Masters	ACER
	Mrs Barbara Mawson	Illawarra Primary School, Tas.
	Dr Diane Mayer	University of Qld, Qld
13	Mrs Kerrie McDonald	Pakenham Consolidated School, Vic.
	Ms Sharon McDonough	Bacchus Marsh Grammar, Vic.
5	Mrs Elizabeth McDougall	St James College, Tas.
20	Mrs Ellie McGinness	St Finn Barr's School, Tas.
	Ms Amanda McGraw	University of Ballarat, Vic.
6	Mr Peter McGukian	ACER
	Ms Kim McKeen	Univ of Wollongong, NSW
	Dr Carol McKenzie	Taylors College, Vic.
	Mr Peter McKinnar	Copperfield College, Vic.
23	Ms Lisa McLeod	Massey University, NZ

23	Dr John McMath	St Andrew's Cathedral School NSW
	Mr Andrew McPhail	Kinross Wolaroi School, NSW
6	Mrs Maureen Mears	University of Notre Dame, WA
4	Marion Meiers	ACER
	Ms Jean Memery	NT DEET
	Mrs Cynthia Merrill	Vic. Institute of Teaching
	Mr Andrew Meyenn	Wesley College, Vic.
	Ms Leonie Miller	Holmesglen TAFE, Vic.
	Mr Peter Miller	Barker College, NSW
10	Ms Heneriata Milner	Massey University, NZ
	Mrs Catherine Mission	St Catherine's School, NSW
14	Mrs Susan Mootz	Paddington Public School, NSW
8	Mrs Wendy Moran	Australian Catholic University, NSW
8	Dr. Graham Morey-Nase	St Michael's Grammar School, Vic.
	Mr Ray Moritz	Catholic Education SA
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	Mrs Carol Morrison	St Peter's Primary School, Vic.
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	Mrs Leanne Newton	Bishop Tyrrell Anglican College, NSW
2	Professor Jennifer Nicol	University of Notre Dame, WA
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	Rosalie Nott	Catholic Education Commission, NSW
	Ms Mia O'Brien	University of Queensland
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23	Ms Geraldine O'Keefe	Catholic Education Office, WA
	Mr James O'Meara	University of Ballarat, Vic.
	Mrs Debbie O'Riley	Angle Vale Primary School, SA
	Ms Harriet Olney	Edith Cowan University, WA
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6	Prof Pant	Plant EDU - India
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	Dr Suzanne Parry	Northern Territory University
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	Mr Peter Partridge	Lightning Ridge Central School, NSW
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	Mr Steve Paul	John Paul College, Qld
	Ms Cheryl Peers	Queensland Studies Authority
	Erica Pegorer	Lavalla Catholic College, Vic.
	Mrs Jane Pelvin	Canberra Girls Grammar School
	Mr Tom Perfect	St Bede's College, Vic.
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	Mrs Lyn Place	Dept. of Education & Training, Vic.
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9	Mrs Ruth Radford	Dept. of Education, Tas
21	Mr David Raphael	William Clarke College, NSW

	Mr David Rawnsley	St John's Grammar School, SA
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11	Mrs Melissa Robertson	Cranbourne Christian College, Vic.
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	Ms Janice Roberts	Hewett Primary School, SA
7	Mr Graham Robertson	Shore School, NSW
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	Dr Mary Rohl	Edith Cowan university, WA
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9	Ms Gaelene Rowe	La Trobe University, Vic.
3	Dr Ken Rowe	ACER
1	Pam Russell	IARTV
	Dr Deirdre Russell-Bowie	Univ of Western Sydney, NSW
	Ms Jane Russo	SSABSA - SA
	Mrs Erica Ryan	Catholic Schools Office, Vic.
	Dr Janette Ryan	University of Ballarat, Vic.
	Mrs Kerry Sanderson	CEO Wilcannia Forbes
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	Assoc. Prof. Angela Scarino	University of South Australia
19	Mr David Scott	Newington College, NSW
22	Mr Anthony Sear	St Ignatius' College, NSW
	Ms Anne Semple	Formally ACER
	Ms Christine Shakya	Catholic Education Office, Syd
	Dr Geoffrey Shaw	All Saints' College, WA
3	Mrs Leonie Shaw	Education Queensland
18	Mr Tim Short	Monte Sant' Angelo College, NSW
	Br Vince Skelly	Q.C.E.C. - Qld
3	Prof Malcolm Skilbeck	Former Deputy Director for Educ (OECD)
11	Ms Ann Small	St Andrew's College, NSW
12	Mrs Dyann Smith	Flinders University, SA
13	Julie Smith	Pakenham Consolidated School, Vic.
10	Mr Stephen Smith	Central Qld University
8	Mr Vaughan Smith	Caulfield Grammar School, Vic.
4	Ms Bronwyn Stafford	NSW Department of Educ and Training
	Dr Robert Stevens	Dept. of Education & Training, NSW
22	Mr Robert Stevenson	Willetton Senior High School, WA
17	Helyn Strokowsky	ACT DEYES
	Mrs Amanda Swaney	Ruyton Girls' School, Vic.
	Mr Ken Symonds	All Saints Anglican School, Qld
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	Dr Richard Taffe	Charles Sturt University, NSW
	Mr Mukhtiar Tanoli	H.W.C.E.R. (Pakistan)
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	Ms Trudie Taplin	DECS - SA
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	Mr Michael Terry	Geelong College, Vic.
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	Ms Jan Thomas	The University of Melbourne
	Ms Kerry Thomas	University of NSW
	Mrs Julie Thompson	Assoc. of Independent Schools, NSW
2	Mr Chris Thomson	Teacher Quality Taskforce, Vic.
	Mr Greg Thornton	Catholic Education Office, NSW
	Mrs Liz Tidey	Charles Condor Primary School, ACT
	Dr Frances Townsend	Christchurch College of Education
15	Ms Caterina Troncone	St Ignatius' College, NSW

	Dr Bryan Tuck	Auckland College of Education
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	Dr Jan Turbill	University of Wollongong, NSW
	Mrs Dagmar Turnidge	IARTV - Vic.
	Dr Pye Twaddell	SPELD NSW
	Mrs Natalie Vandeppeer	Canberra Girls Grammar School
	Mrs Helen Verdnik	Christian College, Vic.
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	Mrs Merylyn Walsh	Ormiston College, Qld
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	Mrs Sylvia Walton	Tintern Schools, Vic.
7	Ms Diane Wasson	NSW Depart of Education & Training
18	Mrs Evelyn Waygood	St Vincent's College, NSW
	Mrs Helen Weadon	Damascus College, Vic.
1	Ms Georgina Webb	DEST, ACT
	Ms Jenny Whatman	Ministry of Education, NZ
	Mr Michael White	Vic Curriculum & Assess Authority
	Viv White	Victorian Schools Innovation Commission
20	Ms Joy Whitton	ACER
21	Dr Ron Widmer	St Edmund's College, ACT
	Cheryl Wilkinson	Office of Training & Tertiary Education, Vic.
15	Mrs Helen Williams	St Brendan-Shaw College, Tas.
	Mr Brent Wilson	Our Lady of Mercy School, Tas.
6	Mr Ken Wilson	NZ Teachers Council
	Mrs Judy Wintour	Redeemer Lutheran College, Qld
22	Mrs Laurie Wolfe	St Virgil's College, Tas.
	Dr Christine Woodrow	University of Western Sydney
	Mr Mark Workman	Our Lady of Lourdes School, Tas.
15	Dr Timothy Wright	Shore School, NSW
18	Ms Heather Wuillemin	Davallia Primary School, WA
9	Ms Suzanne Yates	Professional Teachers Council NSW
12	Mr William Yeates	St Augustine's College, NSW
11	Mrs Sharon Young	Dunedin College of Education
14	Mr Peter Zifovich	South Western Sydney Institute of TAFE
10	Mrs Vernita Zigouras	Westall Secondary College, Vic.

Australian Council for Educational Research
19 Prospect Hill Road (Private Bag 55)
Camberwell VIC 3124 AUSTRALIA
Telephone: (03) 9277 5555
Facsimile: (03) 9277 5500
Email: conference@acer.edu.au

www.acer.edu.au

