ISSUE ANALYSIS

THE CENTRE FOR INDEPENDENT STUDIES

No. 64 19 October 2005

Good Teachers Where They Are Needed

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EXECUTIVE SUMMARY

Allowing qualified professionals to become teachers through school-based education has the potential to reduce Australia's ever-increasing shortage of teachers.

Australia has a shortage of suitably qualified maths and science teachers and a continuing problem with attracting good teachers to rural schools. Labour market analyses predict that these problems will become worse in the near future under current demand and supply conditions.

Numerous inquiries and reviews at the state and federal level have provided reason to believe that the requirement for full-time university pre-service education is a deterrent to potential teachers. This is particularly the case for high calibre maths and science graduates, whose career opportunities are numerous and attractive, as well as professionals considering a career change. The sacrifice of a year's salary, with no guarantee of satisfactory employment, is often not an appealing option.

This need not be the case. Alternative forms of teacher education offer a way around this problem, without sacrificing (and indeed arguably increasing) the quality of teacher education.

School-based teacher education, which operates like a paid internship, offers the most promise. In the model proposed here, secondary schools in need of a teacher could recruit directly from recent graduates or from the non-teaching labour force people of suitable qualifications, and allow them to undertake paid teaching duties while they gain their teaching qualification.

School-based teacher education has numerous advantages beyond the labour market imbalances it targets. It is highly efficient, offering schools the opportunity to recruit teachers with the expertise and other characteristics that meet the specific needs of their school. It trains only those teachers for whom positions are available. It effectively addresses widespread concerns that university teacher education courses do not provide trainees with sufficient classroom experience, and that graduates are ill-prepared for taking on full teaching duties.

Despite the clear need for new strategies to attract teachers, rather than making it easier for able people of good character to enter teaching, Australian authorities and education institutions are gradually making it more difficult. Likewise, despite strong evidence that new teachers are sorely lacking in practical experience, there have been limited attempts to make classrooms more central to teacher preparation.

This paper does not argue that it is necessary, however, to overhaul every teacher education programme in the country. What is necessary is to offer alternatives that acknowledge the diverse characteristics and needs of potential teachers and allow them to enter the profession as readily as possible.

This paper suggests a targeted approach that is market-based and therefore hinges on supply and demand. It is aimed purely at secondary school teachers, to address areas of teacher shortage by reducing the disincentives to entering the teaching profession. It is informed by evidence that school-based teacher education is effective, and according to some experts, highly desirable.

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ISSN: 1440 6306
www.cis.org.au

Introduction

A few things we know about education. The most important influence on how much children learn is the quality of teaching they receive. Quality teaching, particularly in the key curriculum areas of maths and science, is determined largely by teachers' depth of knowledge of their subject and their verbal intelligence, that is, their ability to communicate.

There is little evidence, however, that mandatory teacher preparation courses have any consistent effect on teacher competence, at least at the secondary school level. In fact, some researchers have argued that such courses deter high ability people from becoming teachers and thus reduce the overall quality of the teaching force.

In Australia, almost all states and territories are experiencing difficulties filling teaching positions. The problem is specific—there is a current and potentially serious shortage of appropriately qualified secondary level teachers of the physical sciences (physics and chemistry), mathematics and technology. These recruitment difficulties expand into other areas of the curriculum in rural Australia, where shortages are chronic.

Teacher shortages have so far been tackled with inefficient strategies such as one-off scholarships and recruitment campaigns that have increased teacher numbers where they are not required, such as primary teaching.

A specific problem calls for a specific solution. Market-based salary scales, entailing higher pay for highly sought-after teachers, has been proposed by economists,[1] but has not been seriously considered by educationists.

Numerous reviews and inquiries into teaching have revealed a link between teacher shortages and teacher training that supports the hypothesis that mandatory teacher education is sometimes counterproductive. This need not be the case, even if it is accepted that teachers require some preparation and should be formally qualified and certified.

Alternative forms of teacher certification, such as through school-based teacher education, have the potential to increase both the quantity and quality of secondary school teachers. This paper is particularly concerned with maths and science teachers and teachers for rural schools, which present an immediate and pressing problem, but the principles would apply equally to all secondary school teachers.

MCEETYA estimates potential shortages of 20,000 to 30,000 teachers by 2012.

The scale of the problem

In 2003, the Ministerial Council of Employment, Education, Training and Youth Affairs (MCEETYA) published a report forecasting the demand and supply of school teachers over the following decade.[2]

The analysis indicated that although university education courses leading to a teaching qualification were increasing in popularity, Australia faces the prospect of significant teaching shortages, largely due to age-based retirement. MCEETYA estimates potential shortages of 20,000 to 30,000 teachers by around 2012 under current demand and supply conditions.

However, the shortages are unlikely to be across-the-board, and will probably exacerbate existing imbalances in the teaching population. The MCEETYA report finds that a large proportion of new teaching graduates are qualified for primary teaching, while the greatest demand is for secondary teachers. Furthermore, the report finds, the shortages are likely to be most pronounced in certain secondary teaching specialisations, as well as in rural and remote locations and some metropolitan areas. Recent trends in the number of teachers graduating in the specialisations most in demand are 'not encouraging', according to the report.

Science and maths teacher shortages

The importance of high quality teachers of maths, science and technology is self-evident and cannot be overstated. Yet there are insufficient numbers of teachers willing and able to teach these subjects, particularly at the senior school level, and their quality is highly variable.

A survey published by the Australian Council of Deans of Science this year found that large proportions of secondary schools across Australia were having difficulty recruiting

suitably qualified teachers of science.[3] Physics and chemistry teachers were in greatest demand—41% of schools reported difficulty recruiting physics teachers and 31% of schools reported difficulty recruiting chemistry teachers.

The survey also found a large discrepancy between the level of qualifications believed by heads of school science departments to be necessary to teach science, and the actual qualifications of science teachers. Almost all science heads said that at least a minor in the teaching subject is the minimum satisfactory qualification, yet 26% of physics teachers and 13% of chemistry teachers (including senior school teachers) had neither a major nor a minor in their subject. Sixteen percent of junior secondary teachers had not studied a science subject past first year at university and 8% had not studied science at university level at all.

Mathematics teachers are also in short supply. MCEETYA reports that in 2002, four out of eight states and territories had acute, widespread shortages of secondary maths teachers in government schools, while another two states had moderate shortages. In the non-government sector, 41% of schools nationally reported either acute or moderate shortages.[4]

The situation is perhaps even worse than these statistics suggest; as many as 40% of current teachers of junior secondary maths may not be suitably qualified to teach the subject.[5]

A large part of the problem, it seems, is attracting people with maths and science degrees to teaching in the first instance. Of life sciences (e.g., biology and geology) and maths graduates, only one in 25 undertake a teaching course in the year after graduation. Of physical science graduates, the proportion is only one in fifty.[6]

'Many new graduates seem to lack practical teaching skills, as opposed to the theoretical foundations required to be an effective teacher.'

Rural and remote teacher shortages

Data on the teacher supply to rural and remote schools are more difficult to come by, but the difficulties in getting teachers to take jobs in non-coastal non-metropolitan schools are well-known. MCEETYA reported in 2003 that recruitment of teachers to rural and remote areas is a 'severe problem'.

Centralised recruitment practices in government school systems, such as that in NSW, offer new teachers permanent positions in hard-to-staff rural schools in return for 'transfer points'. The accumulation of points makes teachers eligible for positions in more popular locations and schools. This strategy, for the most part, puts teachers in classrooms, but it leads to a high turnover of novice teachers in country schools and the attendant problems of instability and inconsistency.

Variable and questionable quality of current teacher education

There have been numerous reviews and inquiries into the quality of teacher education over the last decade, including a national review chaired by Professor Kwong Lee Dow which reported in 2003. A national parliamentary inquiry is currently underway.

Each successive state and national review and inquiry has found serious flaws in the preparation of teachers. Most criticisms involve the inadequacy of university courses in providing effective practical experience, with the result that graduates are unprepared for the realities of the classroom. On average, one-year postgraduate diploma courses require teachers to spend only 40 to 50 days in a school,[7] and there are additional concerns that even this professional experience is poorly aligned with university courses.

Reports from NSW and Victoria put the situation bluntly. In his NSW review, Gregor Ramsey stated that 'if preparedness for teaching was the criterion applied in any explicit sense to answer the question whether university programmes were satisfactory, schools where new graduates were employed would be hard to convince that they were'.[8]

The conclusions of the recent Victorian parliamentary inquiry were similarly straightforward, stating that principals, teachers, parents and education authorities believe that graduates of teacher education courses are not 'teacher ready': 'Put simply, many new graduates seem to lack practical teaching skills, as opposed to the theoretical foundations required to be an effective teacher'.[9]

Too much educational theory and not enough teaching practice is a frequent source of complaint. According to the national review of teaching and teacher education, a common

theme among submissions to the review was 'the need for practical skills and experience to be a more integral component of pre-service teacher education courses'.[10]

The reviews in NSW and Victoria reached similar conclusions about the balance of theory and practice. The NSW review found that reform is needed to reconnect teacher education and schools, and that the 'professional experience' (school-based practice) component of teacher education should be about 'sustained immersion in the craft of the profession'. It advised that future models of teacher education should structure 'time on the job' to be integral and central.[11]

One of the strongest voices in favour of increasing the involvement of schools in teacher training is the Australian Secondary Principals Association (ASPA). In a submission to the 2003 national review of teaching and teacher education, ASPA describes pre-service teacher education as 'extremely poor' and advocates for the authority for teacher training to be moved to schools and principals. Likewise, ASPA's submission to the current parliamentary inquiry recommends a marked increase in practical experience and 'placing a greater emphasis on conducting teacher education in schools, e.g., an internship model'.[12]

A survey by ASPA found that close to 40% of secondary teachers were teaching at least one class for which they were not qualified.

Who are the teachers we want, and why don't we have them?

It is not just a matter of recruiting more teachers. Quantity is not the only goal, we also need quality.

The research is definitive on teacher quality—some teachers are better than others, and good teaching has a lasting and cumulative effect on students. There is also evidence on what represents good teaching.[13]

All of this knowledge is derived from what actually happens when teachers are in the classroom. Much trickier is predicting which people are most likely to be good teachers. That is, we can identify good teaching from the results it produces, but are there any common attributes of a good teacher?

According to research on student outcomes, there are several characteristics that identify good teachers, but they are not the ones that most people would expect. US research has shown that the only significant predictors of teacher quality are strength of subject matter knowledge (for secondary teachers) and teachers' own level of literacy. Pre-service teacher education courses and advanced education degrees are apparently unrelated to teacher effectiveness, and teaching experience is only significant for the first four or five years, after which there is little growth in effectiveness with each year in the classroom.[14] [15]

In a report published by the Progressive Policy Institute, Andrew Leigh and Sara Mead claim that the strongest research evidence on teacher quality is that showing a correlation between a teacher's verbal or intellectual aptitude and student achievement.

Leigh and Mead write that 'absent any other information about the individuals involved, we would be wiser to bet on the teaching success of an individual with strong verbal and intellectual skills, or high test scores and no teacher training, than we would be to bet on the success of someone with mediocre skills and full teaching certification.'[16]

The findings on pre-service teacher education are perhaps surprising, but what they reveal is not that formal preparation for teaching is always unnecessary, but that current modes of teacher preparation are often inadequate. In this way, the findings lend support for the criticisms of teacher education outlined in the previous section.

At its simplest, teaching requires two things—knowledge of the subject matter to be taught, and the ability to impart this knowledge to others. Teachers must know *what* to teach and *how* to teach it.

It is difficult to argue that any person with a degree in physics would automatically be able to teach physics to a classroom of 16-year olds. It is equally difficult to argue that anyone who has completed a degree or diploma in education could teach physics well.

Yet there is much more tolerance of the second scenario than the first. There is evidence that substantial numbers of teachers are teaching subjects outside their field. A survey by ASPA found that close to 40% of secondary teachers were teaching at least one class for which they were not qualified.[17] This is seen as acceptable, even if not ideal, by most in the education community but the idea of teaching without a formal education qualification is intolerable.

This has been the case in the government school sector for some time. Teachers in government schools are employed by the state or territory department of education, and a condition of employment is that they are registered teachers. In order to be registered, they must have completed an approved course of study in an education faculty of a university.

Non-government schools have traditionally had more freedom in hiring teachers, being able to recruit teachers based on their own criteria, which may or may not include a teaching qualification. This possibly partly explains why teachers with higher degrees in science are concentrated in the independent school sector.[18] But even non-government schools are gradually relinquishing this freedom by agreeing to conform to the requirements of state institutes of teachers, which require teachers to have university teaching qualifications in order to meet the institute's professional standards. Under new NSW regulations, for example, teachers without institute-approved university qualifications must complete them within a certain period of time if they are to obtain accreditation and be legally employed as teachers.

Arguably, the priorities are wrong. There is overwhelming evidence that university-based pre-service teacher training is often of poor quality, and research indicates that it has little bearing on teacher quality. Requiring that teachers do *more* of it seems a pointless strategy.

Not only does this strategy seem counterintuitive, but there is reason to believe that increasing the difficulty of entering teaching is counterproductive. Extensive pre-service education and administrative requirements may aim to raise the bar, but might in effect be keeping out good potential teachers as well as poor ones. Leigh and Mead, among others,[19] suggest that teacher training and certification/accreditation requirements represent an obstacle that would put off highly able graduates from teaching and contribute to teacher shortages: 'Since those with the most attractive career options are most likely to be deterred by administrative impediments, high barriers likely lower teacher professional quality.'[20]

Australia has a general labour market that favours and rewards highly able maths, science and technology graduates, and a teaching labour market that has failed to respond. In an Australian government discussion paper forming part of the Review into Teaching and Teacher Education, it is claimed that 'innovative people with skills in mathematics and quantitative analysis who would be suited to science, technology and mathematics teaching are highly sought after in the information technology and financial services industries'.[21]

The paper goes on to say that while starting salaries for teachers are competitive with other occupations, salary increases are incremental with years of employment rather than performance, and plateau relatively early.

Salary progression may be a disincentive to enter teaching from a long-term perspective, but there is also the initial deterrent of having to complete a further year of study in order to qualify to teach. This is a deterrent not just for recent high-achieving science and maths graduates, who have many attractive career options with which teaching must compete, but also for people who are considering a switch to teaching from another industry or profession. A number of submissions to the current national inquiry into teacher training and to the earlier review of teaching and teacher education make this point.[22]

For recent graduates, a full-time post-graduate diploma means forfeiting a year's salary in another occupation, in addition to the cost of study and cost of living during that period. There is no guarantee of suitable employment at the end. For more mature career-changers, the risk is even greater if they have a family to support and other financial commitments.

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Past and present strategies in Australia

State and territory governments have attempted to increase overall teacher numbers using recruitment campaigns that promote the role of teachers in society and the benefits of a career in teaching. Some states offer one-off bonded scholarships to students who agree to accept appointments in hard-to-staff schools on graduation. These strategies may have

contributed to an increase in the number of applicants to university education courses, and the Australian Council of Deans of Education argues that the days when teaching was considered a 'soft option' or a fall-back career are over.[23]

There remain, however, substantial imbalances in the supply and demand for teachers, as noted above. State and territory governments have taken two targeted approaches to shortages in the science, maths and technology subject areas: the re-training of existing teachers of other subjects as science, maths or technology teachers (teacher re-training); and encouraging and facilitating professionals with experience and qualifications in science, maths or technology to train as teachers (career changers).

Good teaching is dependent on in-depth knowledge of subject matter, but is not significantly improved by extensive pre-service teacher education.

While it might seem that the re-training of people already in the teaching labour force would be the most expeditious route to increasing the number of teachers in areas of need, it is not necessarily the fastest or the best way to go. Research described above has important implications for the effectiveness of these strategies. It indicates that good teaching is dependent on in-depth knowledge of subject matter, but is not significantly improved by extensive pre-service teacher education.

As such, the fast-track re-training of teachers from other disciplines as science or maths teachers is inadequate to provide teachers with the necessary depth of subject knowledge, while the extensive teacher education required of industry professionals is excessive and arguably delays their transition into the classroom unnecessarily. The emphasis is wrong—a person with teaching qualifications is assumed to be able to move across disciplines with minimal education in their new subject, while a specialist in that subject is assumed to need extensive teacher education, assumptions that are not supported by evidence.

The Australian Council of Deans of Science is favourably disposed toward career-change strategies, but does not consider the re-training of existing teachers appropriate, fearing that the short duration of science training will reduce the quality of science teachers, even if it does increase the quantity.[24]

Although career-change paths may be more defensible from a quality teaching point of view, they have not had high participation rates to date. In their paper *Clever Teachers, Clever Sciences*, Geoffrey Lawrance and David Palmer point out that participation is an important test of an effective teacher education programme, and that well-intentioned programmes that do not attract candidates will do little to reduce the problem. Demand for career-change paths to teaching is unlikely to grow without financial support for students who have financial and family commitments.[25]

Furthermore, even though career-change programmes tried so far recognise the relevant qualifications and experience of people wishing to train as teachers, the reduction in study load is relatively small, thereby failing to remove a major deterrent for potential teachers.

For example, in the NSW Accelerated Teacher Training Programme (ATTP), people with appropriate industry experience still have to undergo 18 months of pre-service university study, of which only 13 weeks is spent in a school. Even this small change has led the ATTP to be described as 'one of the most significant changes to occur within the Australian teaching profession'.[26]

One of the most frequently cited examples of a successful industry re-training initiative is the partnership between the University of Newcastle and the BHP steelworks. BHP employees facing redundancy were offered the opportunity to train as teachers while still employed at BHP, with a reduced study load as 'Recognition of Prior Learning'. There was no overall reduction in study time for degree-qualified employees, however, and the programme cannot be described as 'school-based'.

Alternatives to the traditional modes of teacher training are limited in Australia. A variety of programmes has been developed by individual universities, but they can rarely be described as innovative. A review of site-based teacher education (SBTE) conducted by the Victoria University of Technology for the Commonwealth Government in 1998 found few examples of programmes that substantially changed the duration or delivery of teacher education.

Most simply involved an extension of the practicum, or a closer collaboration (usually described as a 'partnership' model) between universities and schools, but few offered any

programmes that were truly flexible or 'alternative' in structure or location. Despite this limited scope, the review found that teacher trainees who had spent more time in a school were more likely to be offered a permanent position in that school on graduation.

Only one teacher education programme came close to meeting the definition of school-based (or 'site-based') teacher education, whereby the majority of the content of teacher training is conducted at a school.[27] The Community-based Indigenous Teacher Education Programme (CITEP) was developed specifically by the University of New England to increase the number of indigenous teachers in one particular school. The programme ran from July 1998 but was abandoned sometime before 2001. Information on the programme is difficult to come by.

The recent inquiry into teacher education in Victoria also identified a similar community-based programme designed to appeal to Aboriginal people who do not want to leave their communities to train as teachers, which has been run by Deakin University since 1986. Teacher trainees work in schools in their communities and receive intensive tutorial blocks in short periods on campus.

The Victorian inquiry report described several teacher education programmes under development that provide some alternatives to the traditional modes of achieving teaching qualifications, such as by offering courses in intensive modes and outside working hours. Only one programme identified in the report, however, can accurately be described as 'school-based'—the Career Change Programme (CCP), initiated as a pilot programme this year, and involving 28 students.

There is a glaring absence of school-based modes of teacher training, despite the positive results of small-scale SBTE programmes.

The CCP allows the employment of people with relevant qualifications and industry experience in schools as teacher trainees. The programme, implemented by Victoria University, will allow teacher trainees to graduate after two years. Trainees have four days of teaching experience and one day of university course work each week. The trainee is under the supervision of an appointed experienced teacher.

The structure of this CCP is a significant departure from the tentative approaches to school involvement in teacher education implemented in the past, but perhaps the most radical aspect is that the teacher trainee is paid a salary of more than $38,000 per annum, plus substantial additional sums for study-related expenses. Brenda Cherednichenko, head of the school of education at Victoria University, believes this is the only programme of its kind in the country.[28]

History suggests that a positive evaluation of the pilot phase of CCP is no guarantee it will continue. A similar programme in NSW in the early 1990s, involving recent maths and science graduates rather than career-changers, was apparently short lived.

The programme, called IMSTEP (Inservice Maths and Science Teacher Programme), was trialled by the University of Western Sydney to combat difficulties in adequately staffing government secondary schools in western Sydney.

The programme offered maths and science graduates salaries to teach in western Sydney secondary schools while they completed Diplomas of Education at UWS. The teacher 'interns' undertook a 14-week intensive training period prior to starting at the school, where their teaching load was equivalent to four days a week, and completed the rest of the Diploma course work on a part-time basis during their two year internship.

An evaluation of the programme compared teachers who had taken the IMSTEP route with teachers who had taken the traditional full-time study path for the Diploma at UWS. It asked the teachers how well prepared and how competent they felt in the classroom, and found very little difference between the two groups. The study concluded that although the IMSTEP model was no quicker and was more costly in the short-term than full-time study, it had the potential to attract candidates and produce teachers who are more likely to stay in the profession, and was therefore economically-defensible in the long-term.[29] Unfortunately, IMSTEP is no longer running.

The 1999 Victoria University review of SBTE provides an insight into the glaring absence of school-based modes of teacher training, despite the positive results of small-scale programmes. It was found that SBTE was 'highly contentious, in both political and practical terms'.[30]

Tony Kruger and his co-researchers found strong resistance to SBTE in universities. Many of the objections raised were related to university academics' reaction to the idea of teacher 'education' versus teacher 'training'.[31] Teacher 'training' is perceived to be narrow and utilitarian, while teacher 'education' apparently implies the transmission of a body of professional knowledge. SBTE is aligned in the minds of many academics as being 'technically rational training', rather than education.

Kruger et al. argue that this analysis of education versus training, and university-based versus school-based teacher preparation, 'tends to inhibit efforts at improving and changing teacher education'.[32]

When surveying university education faculties to get a picture of the nature of teacher training courses on offer across the country and to determine views on SBTE, Kruger et al., received a large number of responses that were highly critical of the concept of SBTE. Many even condemned the review itself as being ideologically driven. Respondents viewed the survey and the review as part of a 'right-wing agenda',[33] and feared that it was part of a Federal Government strategy to transfer all teacher preparation out of universities, and to reduce funding. Survey responses were so suffused with political antagonism, the reviewers decided the survey was an unreliable instrument for the collection of the information for which it was intended.

Teacher educators believe in the importance of the theoretical, cultural and historical contexts of teaching and fear that this will be diminished or lost in SBTE.

Non-university contributors, and those more familiar with SBTE, were less scathing. They were concerned that current university courses were not providing enough practical teaching skills, but did not advocate abolishing the role of universities. They also understood that school-based approaches tend to be more expensive than full-time university education, which is inconsistent with the criticisms of SBTE as a cost-cutting measure.

These 'substantial differences in opinion' between university and non-university (school personnel, government departments, unions and teacher association) survey respondents were confirmed in consultation interviews.

The fierce opposition to SBTE from universities might be explained in two ways. One explanation is that teacher educators believe in the importance of the theoretical, cultural and historical contexts of teaching and fear that this will be diminished or lost in SBTE. Another explanation is self-preservation. Although almost all, and certainly the most credible models of SBTE maintain a role for universities, education faculties would undeniably lose their strangle-hold over teacher preparation, and therefore, to a certain extent, over school education.

Education faculties would also have to balance the concerns of schools and school students with the concerns of academia—an uncomfortable transition for some.

SBTE in Britain and the United States of America

Around half of OECD countries are currently experiencing, or are expecting, teacher shortages in key areas of the curriculum and in certain localities, to varying degrees.[34] This problem, in combination with concerns about the quality and effectiveness of teacher preparation, has led to widespread reforms in teacher education in the United States and Britain, in particular.

In their review of science teaching, Geoffrey Lawrance and David Palmer note that reforms to teacher education overseas, including in non-English speaking Europe, are generally characterised by an increased role for schools.[35]

Yet despite the clear need for new strategies to attract teachers, Australian authorities and education institutions have not been innovative and, rather than making it easier for able people of good character to enter teaching, are gradually making it more difficult. Likewise, despite strong evidence that new teachers are sorely lacking in practical experience, there have been limited attempts to make classrooms more central to teacher preparation.

It is not as if Australia would be heading into uncharted territory. The United States and Britain have taken markedly different paths in establishing site-based teacher education, and provide a strong precedent.

Britain

In Britain all teachers must either have achieved, or be working towards, Qualified Teacher Status (QTS) in order to teach in government schools. There is some diversity in pathways to achieving the QTS requirements, however. Teacher preparation can be completed through the traditional routes of undergraduate or post-graduate university study, or through an employment-based route.

School Centred Initial Teacher Training (SCITT) is a post-graduate teacher preparation programme that is provided by Teacher Training Agency-accredited schools, in collaboration with universities and Local Education Authorities. Teacher trainees are in the classroom from day one, gaining classroom experience and earning salaries while they complete their studies.

The SCITT programme offers two employment-based options—the Graduate Teacher Programme (GTP) and the Registered Teacher Programme (RTP). The GTP is for people with an undergraduate degree and minimum specified GSCE (school finals) results. GTP candidates work in schools for the unqualified teacher pay rate, and typically qualify after a year (but this can be as little as three months with relevant experience). The RTP is for people such as career-changers who have not completed a full degree but have the minimum specified GCSE results. RTP candidates also earn the unqualified teacher salary, but typically qualify after two years.

Also, in 2003, a special programme—Teach First—was introduced specifically to address teacher shortages in London. Teach First is privately funded, highly competitive, and puts high achieving graduates in hard-to-staff schools and pays them to teach while they train.

The GTP and RTP routes to qualified teacher status began operating in Britain in 1998 and have grown rapidly. In 1998, the GTP had 100 recruits, increasing to 3,500 recruits in 2002 (approximately 10% of all teacher trainees). There is little hard evidence on the overall effectiveness of the GTP and RTP versus traditional teacher education routes, but a review by the Office of Standards in Education concluded that some trainees were not achieving to their potential (although no comparison was made with university training) and highlighted the need for more consistent quality controls, which are now being put in place.[36]

Employment-based routes in the UK have been 'very powerful' and, where implemented properly, have higher teacher retention rates than traditional routes.

However, the Education and Training Committee in Victoria heard during its inquiry into teacher training that employment-based (i.e., school-based) routes in the UK have been 'very powerful' and, where they are implemented properly, have higher teacher retention rates than traditional routes.[37]

United States of America

In the United States, where teacher shortages are acute in some states, governments have been forced to allow non-certified teachers into classrooms. With the passing of the 'No Child Left Behind' (NCLB) Federal legislation in 2001, which requires all teachers to be 'highly qualified' by 2006, those states not already doing so have begun to explore alternate routes to certification. NCLB legislation says that teachers must have a degree, demonstrate competence in their teaching field, and have state certification or pass a licensure exam. Certification does not necessarily require completion of a university teaching course.

The traditional pathways to teaching in the United States are by university study—typically either a four year undergraduate education degree or a postgraduate masters degree (mostly one, sometimes two years), but in the last decade alternative, school-based routes to certification have proliferated.

The US National Center for Education Information (NCEI) began collecting data on alternative certification in 1983 and reports a rapid growth in alternative certification routes.[38] In 2005, 47 states plus the District of Columbia, reported 122 different alternative routes to teacher certification. Approximately 35,000 people are entering teaching through alternative certification routes each year.[39]

The US experience differs markedly from the British reforms. Unlike the SCITT programme, alternative certification in the US has not been driven by a centrally

determined policy, and is not administered by a Federal Government agency. Therefore, a large variety of programmes has been established.

Although alternative routes are still controversial in some states, the NCEI says that they are having a significant impact on the way teachers are educated and brought into the profession. The NCEI acknowledges that the quality of programmes is variable, but argues that over the last decade, the concept of alternative certification has become respectable, as a consensus has developed about the criterion of effective programmes.

The states with the longest history and most widespread use of alternative certification are California, New Jersey and Texas. In New Jersey, around 20% of all new teachers are hired through alternative certification programmes, and all three states report that teachers certified through these routes 'perform as well, and in some cases, better, on certification examinations as their counterparts who completed traditional teacher education programmes.'[40]

The NCEI also collates statistics on the characteristics of alternatively certified teachers, finding that such programmes produce a wider variety of teaching candidates than traditional programmes, attracting more males, more ethnic minorities and older people with higher levels of education and professional experience.[41]

Alternative certification programmes attract more males, more ethnic minorities and older people with higher levels of education and professional experience.

- 38% of alternatively certified teachers are male, compared with 25% of all new teachers
- 29% of alternatively certified teachers are non-white, compared with 20% of all new teachers
- 70% of alternatively certified teachers are over 30, compared with 39% of all new teachers.

NCEI surveys report that alternatively certified teachers have high rates of retention and are more likely to indicate an intention to remain in teaching.

- Nearly two-thirds (62%) of the survey respondents entering teaching through alternate routes expect to be teaching K-12 five years from now. States with the highest percentage of alternatively certified teachers report that 87% of them are still teaching after five years.
- Only 5% of respondents reported they expected to be employed in an occupation outside of education in five years time. Only 2% reported they expected to be retired completely, compared to 22% of the overall teaching force.

One of the most high profile alternative certification programmes is Teach For America (TFA). TFA is privately funded and is targeted at high-achieving university graduates from a range of disciplines. Successful candidates complete an intensive teaching course over summer vacation and then take up paid positions in hard-to-staff schools (typically in low-income urban or rural schools) for a period of at least two years. TFA has proven to be extremely popular. There were 17,000 applications for 2,000 places in 2005, selected on the basis of academic achievement, community involvement and character.[42]

Perhaps due to its high profile, TFA has been at the centre of debates over the effectiveness of alternative certification in the US. A study published last year by research institute Mathematica showed that school students taught by TFA recruits did as well in reading, and better in maths, than students taught by certified teachers.[43] However, another study published this year, by leading teacher education proponent Linda Darling-Hammond of Stanford University, concluded that TFA teachers achieved significantly worse results from their students than certified teachers.[44]

The methodological differences between the studies are numerous, and criticisms have flowed between the researchers, the TFA organisation and others. Yet even without weighing up the statistical technicalities, the two conflicting studies do not necessarily cancel each other out. While the Darling-Hammond study challenges the idea that an uncertified/untrained teacher is as effective as a certified/trained one, it does not rule against alternative certification unequivocally. It found that TFA recruits who become certified after about two or three years do 'about as well' as other certified teachers. And in an interview published in an article this year, Darling-Hammond

acknowledges that 'There are a lot of alternative routes that do not give short shrift to good preparation.'[45]

Likewise, the US National Council on Teacher Quality reported to the Victorian Education and Training Committee's inquiry that alternatively certified teachers are of equivalent quality to traditionally certified teachers.[46]

The US Federal Government seems convinced of the merits of alternative certification, both in terms of the quality of teacher preparation and the labour market benefits. In an official document supporting alternative certification, the US Department of Education writes that alternative routes 'allow people such as career changers and those who have been out of the job market (for example, stay at home mothers) and who hold at least a college degree to transition into teaching without the hardship of leaving the paid workforce or the expense and possible redundancy of traditional teaching programs…And they can meet the needs of a specific local setting, training people close to home where they are likely to stay.'[47]

Like the National Centre for Education Information, the US Department of Education endorses alternative certification programmes that meet certain criteria, including the requirement that candidates hold at least an undergraduate degree and have as their goal state certification through university study while teaching. Good on-the-job supervision, mentoring and support are also identified as key to high quality alternative certification programmes.

It is necessary to offer alternatives that acknowledge the diverse characteristics and needs of potential teachers and allow them to enter the profession as readily as possible.

The case for school-based teacher education in Australia

When a problem is enduring and is not being improved by current approaches, new strategies are required. Such is the case with teacher shortages and related concerns about the quality of teacher preparation in Australian universities.

Little will be achieved by tinkering at the edges of teacher education programmes. Moves to increase or rearrange the time spent in practicum may improve existing teacher education courses for students already attracted to a teaching career, but will not make them more appealing to highly able people put off teaching by the financial and time sacrifice required by full-time study.

This paper does not argue that it necessary, however, to overhaul every teacher education programme in the country. What is necessary is to offer alternatives that acknowledge the diverse characteristics and needs of potential teachers and allow them to enter the profession as readily as possible.

This paper suggests a targeted approach that is market-based and therefore hinges on supply and demand. It is aimed purely at secondary school teachers, to address areas of teacher shortage by reducing the disincentives to entering the teaching profession. It is informed by evidence that school-based teacher education is effective, and according to some experts, highly desirable.

In the proposed model, teacher trainees would be selected by schools, which would guide their teacher training and pay them a salary as they undertake classroom duties. The trainee might be a recent graduate or a career-changer with suitable experience and education. They would undertake a short period of intense course work and then take on a reduced teaching load in a school while they complete the necessary university studies. Teaching duties would initially be under the direct supervision of an experienced teacher at the school, but this direct supervision would eventually become a guide/mentor relationship.

Such a model holds promise for subject and locality based teacher shortages, and also addresses concerns about the level of practical experience of teacher trainees. Universities would still play a key role, a factor that should help overcome fears that teachers will have insufficient 'education' to accompany their 'training'.

Teachers would still work toward achieving the professional standards set by state teacher institutes and registration boards, but the initial phase of their progress toward that goal would take place in a different setting—in a school rather than a university. While there are good arguments that maintaining a place for universities and registration standards are unnecessary and stifling, teacher professional standards have been embraced

by teachers and academics and therefore must be acknowledged if alternative certification programmes are to be accepted by the education community.

Recruiting rural teachers

School-based training would be particularly helpful for teachers in rural schools, both in terms of recruitment and their initial experiences.

For non-rural people willing to accept a teaching post in a rural area, school-based training would provide a more relevant educational setting, rather than doing practicum in Sydney's inner west and then taking a first year job in the NSW opal mining town of Lightning Ridge.

Research conducted by Elaine Sharplin at the University of Western Australia indicates that the major causes of dissatisfaction among new teachers in rural areas are the lack of school support and having to teach outside of areas of training.[48] Researcher Megan Ewing at Edith Cowan University suggests that if more care were taken to match people to the right schools and contexts, there might be less attrition.[49]

School-based training may also help to recruit teachers to rural schools by providing jobs to local people who do not wish to move to a city for university.

School-based teacher education would solve this problem. If a person were to be placed in a rural school for their training, with an appointed supervisor/mentor and the support of the school executive, he or she would not be expected to 'sink or swim'. By the time the graduate took on full duties, he or she will know the school and the community well. Furthermore, the school will have some responsibility for the quality of the teacher's training, and will have an investment in the teacher's future performance.

School-based training may also help to recruit teachers to rural schools by providing jobs to local people who do not wish to move to a city for university. A large proportion of prospective teachers are career-changers—educated people who have spent time in the work force. As argued above, the prospect of a year of full-time university study, or even two years part-time, ranges from daunting to almost impossible if they have families to support, and especially if this involves spending substantial time away from home.[50] Placing them in a school, so they can start earning while they are learning is a potential solution.

It has also been argued that a 'grow your own' approach provides the possibility of higher retention rates, as people who are already members of a rural community are more likely to remain there to teach.[51]

Recruiting maths, science and technology teachers

The greatest shortages of teachers are in subjects where graduates with the necessary expertise and knowledge have the most attractive alternative career options. For people with a good maths, science or information technology degree, teaching is fairly low on the list of options in terms of salary potential and career development.[52] Add the requirement of an extra year at university, with the attendant loss of earnings and no guarantee of a satisfactory job offer, and teaching becomes even less attractive.

In a report prepared for the Organisation of Economic Cooperation and Development, Malcolm Skilbeck and Helen Connell suggest that encouraging mature-age entry to teaching is a promising means for addressing the undersupply of highly qualified maths and science teachers.[53]

Problems remain with the training itself, however. Lawrance and Palmer's research indicates that maths and science graduates who undertook a postgraduate diploma in education found much of the course content irrelevant, and would have liked more experience in the classroom before graduating.[54] These sorts of criticisms are important not just for those concerned about the quality of teacher preparation, but also influence peoples' willingness to enrol in and complete a teacher training course.[55]

School-based training offers the prospect of earning a salary while earning a valuable teaching qualification. It also allows graduates a measure of control and security over their places of work. They seek a place in a school of their choice, and if they are successful in gaining a place and perform satisfactorily, can be reasonably assured of a job. Traditional teacher trainees graduate with no certainty of work at all, let alone in a location or school of their choice.

Quality Benefits of SBTE

- If teacher trainees undertake a school-based training programme, by the time they graduate they are no longer classroom novices.
- It would attract people who are put off by a year of full-time study, whether recent graduates or career changers.
- It offers a reasonable degree of certainty about the prospect of suitable employment.
- It addresses areas of specific teacher shortage—subject and geographic—and avoids inefficiencies by taking a targeted, demand-driven approach. Current strategies to attract teachers have either taken a broad approach, increasing teacher numbers where they are not required (for example, primary education), or have been ineffective with their target group, by failing to remove the existing disincentives (for example, reducing training from 2 years to 18 months).
- Schools can target high-ability graduates who possess the expertise required for their particular vacancies. They would be able to then look for the applicants with the other attributes they seek in a teacher that are not evident from an academic transcript, such as character, commitment and verbal ability.
- Schools would benefit from making a long-term commitment to a teacher-trainee with the potential to become a permanent staff member, rather than to have a succession of teacher trainees that stay for four to six weeks, who leave just as they are becoming useful.
- Teacher trainees would see a full academic year in action, including curriculum development and student progress.
- Rather than completing assignments that are disconnected and theoretical, teacher trainees would be able to base their work on a real educational environment in real time.
- Variety of practical experience could be achieved by setting up short-term exchanges among a network of schools.
- It is market-driven, so teacher trainees know when they undertake training that there will be jobs for them at the end of it if they perform satisfactorily.

SBTE is market-driven, so teacher trainees know when they undertake training that there will be jobs for them at the end of it if they perform satisfactorily.

The role of schools

Schools would need to provide a mentor/supervisor who is responsible for ensuring that the teacher trainee's time in the school is well-spent, so that both trainee and school get maximum benefit from the process. They would liaise with the university to ensure that the trainee and the school are meeting all requirements. They would make sure that all necessary curriculum content is delivered effectively.

The supervisor/mentor would have a reduced teaching load and also a salary loading. The first few months of the year would be particularly busy for the supervisor/mentor, but this time obligation would be reduced as the year progresses and the teacher trainee needs less direct supervision. They would eventually need only to oversee the teacher trainee's lesson plans, student assessments, and reporting.

The role of universities

In their review of SBTE, Kruger and colleagues firmly endorse the role of universities in all teacher-training, including SBTE. Their report says that 'nowhere in the literature on school-based teacher education has a sound and non-ideologically-driven case been made for the complete removal of the university from the complex process of teacher education'[56] and that 'no interviewee, no matter how critical some were of the role of universities in developing student teachers' practical competence, argued for teacher education outside of the professional academic education context provided by the university.'[57]

To maintain the role of universities, however, would require significant changes in university practice. Education faculties would need to run on a full calendar year, not the shorter academic year. They would need to provide an intensive summer course for trainees entering schools at the beginning of the school year, and provide classes outside school hours and during school holidays.

They would need to liaise more with schools and provide information to participating schools about the study and assessment obligations of teacher-trainees. The school and university would jointly decide when the student was ready to graduate and take on full teaching duties.

The role of state, territory and national teacher institutes and registration boards

All states and territories currently have, or are developing, professional standards that teachers must meet in order to become 'registered' teachers, an accreditation necessary to teach in public schools. Presently, this includes the completion of endorsed university education courses totalling at least four years of full-time study.

School-based teacher education does not mean the abandonment or even the diminution of professional standards. There is no reason why a teacher trainee could not achieve the required professional standards through school-based training. They would be subject to the same criminal background checks before entering schools, and would have provisional certifications allowing them to teach under the supervision of registered teachers. On graduation, they would be given the level of registration normally allocated to first-year teachers and progress as usual through the levels of professional attainment. Having spent a year in the classroom they may even achieve these standards more quickly than traditional teacher-trainees.

School-based training does not involve lowering the bar, but rather providing an alternative way to reach it.

For school-based teacher training to have any impact, it will have to be endorsed by teacher institutes and registration boards, as these organisations are the gate-keepers to the profession. They will need to recognise school-based training does not involve lowering the bar, but rather providing an alternative way to reach it.

The cost of SBTE

School-based teacher training is not a cost-cutting exercise. It would be no less expensive than traditional teacher training, and possibly more expensive.[58] It involves a salary for the teacher trainee as well as a salary loading for the supervising teacher.

The rate of pay in government schools for teacher-trainees would be determined by the department of education in their state. In non-government schools, it would negotiated by the trainee and the school.

In addition, the employer (state government or individual school) might offer a bonded scholarship. HELP (previously HECS) fees could be met by the trainee's employer if the student commits to teaching in the school for a nominated period of time after completion of their training. The school or other employer could pay HELP fees up front, or could meet the repayments for as long as the teacher trainee remains in employment with them. If the teacher trainee is not prepared to make a commitment to the school, he or she would be liable for his or her own HELP obligations.

Although possibly more expensive than full-time study, school-based teacher training provides a return on investment by being more efficient. It trains only those teachers for whom there are available positions, and fills those vacancies more quickly.

Conclusion

Considerable support has been expressed for alternative models of teacher preparation, particularly site-based teacher education, in Australia. Significantly, strong support for school-based teacher education comes from the Australian Secondary Principals Association, which has described pre-service teacher education in universities as 'extremely poor'.

The Commonwealth Government's Review of Teaching and Teacher Education's concluded that school-based training, with paid teaching work, has been 'under-used in Australia, but have great potential for attracting people suitable to teaching and for strengthening the relevancy and immediacy of teacher education.'[59]

The Victorian Education and Training Committee's inquiry into teacher education recommends that alternative models of teacher education be explored, finding school-based models to have 'significant potential … to accelerate entry into teaching and to enhance the quality and relevance of teacher education."[60] Gregor Ramsey's review of teacher education in NSW made similar recommendations five years earlier.[61]

Yet little progress toward providing site-based alternatives has been made. One reason is that universities seem to have no interest in loosening their grip on teacher training. It is disappointing that the most trenchant opposition to alternative models of teacher education comes from universities.

The most notable exception to the rule is Victoria University in Melbourne, which has had a long interest and involvement in developing the capacity of schools to be the main site of teacher training, in close collaboration with the university's school of education. Academics at Victoria University hold that school students should be central to teacher training, and that the impact teachers have on student learning is the best demonstration of their competence. This sounds like good sense and should resonate with all concerned with teacher quality, but it is a long way from the practices of almost all other universities.

Australian advocates of alternative forms of teacher education have been circumspect about the role of universities in maintaining the status quo. Tony Kruger and colleagues propose in their review that universities' opposition to SBTE, often based on a 'dialectical analysis' of education versus training, where SBTE is the latter, 'tends to inhibit efforts at improving and changing teacher education.'[62] Lawrance and Palmer maintain that university academics' defence of their role in teacher education is not self-serving, since such an implication 'not only reflects unfairly on the integrity of the researchers, but ignores parallel opinion beyond the tertiary environment'.[63]

It is disappointing that the most trenchant opposition to alternative models of teacher education comes from universities.

In the US, writers have been more critical of universities. Frederick M. Hess has written frequently about the need to reform teacher certification in the United States so that it is less prohibitive to potential teachers. He takes particular issue with the fact that universities have a vested interest in ensuring that university study is a pre-requisite to gaining certification: 'When teacher educators with strong normative beliefs are deputized as gate-keepers to the profession, as is the reality with teacher licensure, the stakes surrounding their convictions grow exponentially.'[64] J.E. Stone says that a further problem is created by 'regulatory capture', where the agencies charged with overseeing quality in university education faculties, such as governments and teacher licensing boards, are 'unduly influenced by the parties they are trying to regulate'.[65]

Hess points out, however, that the argument that teacher preparation might occur outside universities does not necessarily lead to the idea that university teacher education programmes should be abolished, or even forced to change, just that there should be more freedom in how teacher preparation is provided. Both Hess and Chester E. Finn, Jr., another high-profile critic of teacher licensure, state that no particular model of teacher education should be imposed across the nation, that there is no benefit in a 'cookie cutter' approach, and that responsible experimentation and innovation is the wisest course. Their criticism is of the institutions that stand in the way of this occurring.

The argument in favour of school-based teacher education, therefore, does not demand a new mandate for teacher preparation, such as the situation in the UK, where one centralised system has been replaced with another. Universities tend to be resistant when change is forced upon them. Instead, they must be convinced that change is desirable and necessary. There will always be people who prefer to undertake the traditional study route into teaching. The option to do this should not be removed. However, current and projected teacher shortages, as well as well-documented concerns about teacher quality, are evidence that tradition needs to be challenged.

There are two major hurdles for school-based teacher education. Teacher institutes and boards of registration in the states and territories, and the National Institute of Quality Teaching and School Leadership, must take the lead in being open to alternative forms of teacher education. If these organisations acknowledge the legitimacy of school-based teacher education and encourage its development, there will be reason for universities to make provision for such programmes. Quality assurance could be provided by teacher institutes, using criteria established through overseas experience and local expertise.

A more difficult issue is industrial legislation. In many states, public schools have no say in the staff they hire—an important component of school-based teacher education. For SBTE to be most effective, the school and trainee must have chosen each other and there

must be an agreement between them that allows for the possibility of full employment on graduation. This is in the interests of both the trainee and the school. It also underpins the efficiency of the model, which is achieved by its tightly targeted approach of matching teachers with jobs. Where government legislation precludes such individual arrangements between schools and teachers, it will need to be amended, and there is therefore a critical role for governments in allowing school-based teacher training to proceed.

School-based teacher education is not a pie-in-the-sky radical reform idea. Small-scale programmes have been successfully run by individual universities in Australia over the last decade. If adopted and endorsed on a wider scale, they have the potential to be a highly effective way of circumventing a serious deficiency in the quality and quantity of school teachers.

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ISSN: 1440 6306
www.cis.org.au

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