Data repository for teacher education scoping study

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The Australian Council of Deans of Education website: http://www.acde.edu.au/datarepository.

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Contents

Abbreviations

ABS	Australian Bureau of Statistics
ACDE	Australian Council of Deans of Education
ACER	Australian Council for Educational Research
ADSRI	Australian Demographic and Social Research Institute
AERA	American Educational Research Association
AESOC	Australian Education Systems Officials Committee
AIHW	Australian Institute of Health and Welfare
ALTC	Australian Learning and Teaching Council, formerly the Carrick Institute for Learning and Teaching in Higher Education
ANU	Australian National University
ANZSCO	Australian and New Zealand Standard Classification of Occupations
AOU/AOUG	Academic Organisational Unit/ Academic Organisational Unit Group
ARC	Australian Research Council
ARIA	Accessibility/Remoteness Index of Australia
ASCED	Australian Standard Classification of Education
ASRC	Australian Standard Research Classification
ASSDA	Australian Social Science Data Archive
AVETMISS	Australian Vocational Education and Training Management Information Statistical Standard
AYS	Australian Youth Survey
CDNM	Council of Deans of Nursing and Midwifery, Australia and New Zealand
COAG	Council of Australian Governments
DEEWR	Australian Government Department of Education, Employment and Workplace Relations
DEST	(former) Australian Government Department of Education, Science and Training
DETYA	(former) Australian Government Department of Education, Training and Youth Affairs
DIAC	Australian Government Department of Immigration and Citizenship
DoHA	Australian Government Department of Health and Ageing
DRTE	Data repository for teacher education; a term used for convenience in this report
EIP	Evaluations and Investigations Programme
ERA	Excellence in Research in Australia
FaHCSIA	Australian Government Department of Families, Housing, Community Services and Indigenous Affairs
FIT-Choice	Factors Influencing Teacher Choice study
FoE	Field of Education, a classification used in the ASCED

GCA	Graduate Careers Australia, formerly the Graduate Careers Council (GCC)
GIS	Geographic information systems
HEP	Higher Education Provider, the term used by DEEWR for universities and other recognised higher education providers in Australia
HEEF	Higher Education Endowment Fund
HILDA	Household, Income and Labour Dynamics in Australia survey
IEA	International Association for the Evaluation of Educational Achievement
ISO	International Organization for Standardisation (Organisation internationale de normalisation)
LSAY	Longitudinal surveys of Australian Youth
LSIA	Longitudinal survey of immigrants to Australia
MCEETYA	Ministerial Council for Education, Employment, Training and Youth Affairs
METeOR	Australian Institute of Health and Welfare's Metadata Online Registry
MSOD	Medical Schools Outcomes Database, a project of the Medical Deans Australia and New Zealand
NCES	National Centre for Educational Statistics (US)
NCRIS	National Collaborative Research Infrastructure Scheme
NCVER	National Centre for Vocational Education and Research
NSS	National Statistical Service
NSSC	National Schools Statistics Collection (of ABS)
OAD	Overseas arrivals and departures (DIAC datasets)
OECD	Organisation for Economic Cooperation and Development
PDF	Portable Document Format
PISA	Programme for International Student Assessment
R&D	Research and experimental development
SACC	Standard Australian Classification of Countries
SAS	Statistical analysis software produced by SAS Institute Inc.
SEO	Socio-Economic Objective (of research activity)
SPEAR	Social Policy Evaluation, Analysis and Research Centre, ANU
SPSS	Originally, 'Statistical Package for the Social Sciences', produced by SPSS Inc.
SQL	Structured Query Language
SRD	Summary Record Database
TALIS	OECD Teaching and learning international survey
TEDS-M	IEA Teacher Education and Development Study in Mathematics
UA	Universities Australia, formerly the Australian Vice-Chancellors' Committee (AVCC)
VET	Vocational Education and Training
YIT	Youth in Transition surveys

Glossary

Data Any information that can be stored in digital form, and may be qualitative or quantitative, and be in numerical, text or other forms. Also included as 'data' are numerical projections or estimates of future values (such as expected completions of initial teacher education courses for future years). Numerical or quantitative data is taken to be collective singular because it is considered in this report to be more than an aggregation of discrete numbers – 'data' also involves the relationships between those numbers.

Data custodians Those responsible for data collection, quality assurance, storage, and access to the datasets by external parties.

Datasets Compiled collections of data.

Database (or '**repository**') 'A collection of data and datasets, often compiled from a range of sources and usually organised to permit data to be readily retrieved, managed and updated. Typically databases involve software programs which enable the data to be collected, copied, stored, retrieved and distributed' (Fitzgerald & Pappalardo 2007, p. 22).

e-infrastructure (or '**cyberinfrastructure**') In Australia the UK and European terminology of 'e-infrastructure' is most common. 'Cyberinfrastructure' tends to be used in the USA. The data repository for teacher education being considered in this scoping study is a potentially valuable element of Australian (and international) e-infrastructure. E-infrastructure is discussed in detail in Appendix A.

Geographic information system (GIS). An information system for capturing, storing, analysing, managing and presenting data that is spatially referenced (that is, linked to location, by, for example, latitude and longitude references).

Initial teacher education Pre-service professional education for those preparing to teach in schools, early childhood settings, VET and other areas of education; initial teacher education programs may be at undergraduate or graduate levels; 'post-initial' or 'in-service' teacher education programs are for qualified teachers (or equivalent).

Metadata 'Data about data', or the underlying definition or structured description of the content, quality, condition or other characteristics of data.

Structured Query Language An ISO standard interactive and programming language for querying and modifying data and managing databases

Summary Record Database A document file type that allows data to be formatted, maintained and manipulated in multi-dimensions

Executive summary

The Australian Learning and Teaching Council (ALTC) funded the Australian Council of Deans of Education (ACDE) through Monash University to carry out a scoping study to investigate the need and support for, and feasibility and specifications of, a national data repository for teacher education (DRTE) with systematically managed, accessible and usable data concerned with teacher education and related areas.

Context

Large scale, high quality research to inform policy and practice in teacher education has been strongly advocated overseas and in Australia. Such research requires large national databases and longitudinal studies. The advocacy arises from recognition of the importance of effective teacher education as a foundation for education from early childhood to post-school education, and the importance of policy at all levels being evidence-based.

There is capability among researchers for high quality research to inform policy and practice in teacher education. Yet there is not the database infrastructure to effectively and efficiently support such research.

The DRTE with which this scoping study is concerned could provide such database infrastructure. It could also lessen the need for frequent, ad hoc data collections and searches to support discrete research and policy development exercises.

The proposal for a DRTE has been strongly supported by a wide range of stakeholders in teacher education and the teaching profession. A number of these organisations have resolved to ensure that their members and others are aware of and able to make good use of the repository. Those associated with likely source data collections have also been positive about the proposal.

Some broad shifts in policy priorities and in administrative, regulatory and policy formation structures at the national and Commonwealth levels point to a potential for greater valuing and utilisation of an initiative such as the DRTE, and possibilities for its effective development, management and funding.

There will continue to be change and development in research and policy requirements and priorities, newly available datasets, data management and co-ordination initiatives, and technical capabilities. Therefore flexibility and openness to innovation will be important in the DRTE, which should be conceived as an ongoing resource, not as a 'project' with a finite life.

Location, management and funding

Currently there is no clearly appropriate location, or 'host', for the DRTE. An appropriate location may be in a reformed or new agency, in an existing agency or organisation, or in a stand-alone body.

The location of the DRTE within another organisation has potential advantages of economies of scale and efficiencies, and there might well be significant synergies in ideas, professional activities and external relations between the DRTE and the hosting organisation.

However, there will need to be transparency and accountability regarding the DRTE's funding and other resources.

The organisation hosting the DRTE would need to supportive and compatible if the DRTE is to be of value, well-used and cost-effective.

Whatever its location, the DRTE itself would need a management structure that involves stakeholders in teacher education and experts in data repositories, and staff with relevant professional and technical expertise.

The source of core funding for the DRTE must support long-term sustainability and the reality and appearance of impartiality. Thus it would be most appropriate for the Australian Government to provide assured ongoing core funding for the DRTE. The mechanism or route for this funding would depend on the location of the DRTE and its scope.

DRTE structure

The proposed DRTE would be accessible via a website. The initial interface with the user would be welcoming and include directions to the Document Repository, the Public Access Data Repository and the Full (restricted access) Data Repository.

The Document Repository would contain several types of documents, including guides and manuals, and research and technical reports.

The Public Access Data Repository would include data that is readily usable, straight forward to interpret and involves no issues of potential breaches of confidentiality. It would be immediately accessible by anyone with access to the internet. Data would be in data cubes or SQL databases, and accessed using interactive data analysis web software.

The Full Data Repository would include data that is appropriate to access only with authorisation, more extensive and complex datasets, as well as other data common to the Public Access Data Repository. The Authorisation Protocols would be appropriate to the nature of the datasets in the Full Data Repository.

Data principles and standards for the DRTE

The DRTE would operate according to the appropriate principles and standards. Datasets should, as far as possible, use classifications and definitions that are consistent, publicly recognised and commonly used, though in some areas existing public classifications will need to be augmented. Operating according to appropriate principles and standards is important for the quality of the data, for common understandings of the meanings of the data, and for the linking of datasets for more useful and complex analyses.

Content of the DRTE

Core datasets would be drawn from existing datasets or new collections of potential high value and not great collection cost. There are large numbers of such datasets, some are potentially very extensive and complex, while others are simple.

Datasets drawn from an ongoing longitudinal study of student teachers would be of very high potential value, but need careful consideration and planning and would be of relatively high ongoing cost if they are to be of optimal value.

There are also optional datasets and datasets for future consideration, including datasets arising from research carried out for other purposes, and data that might be collected in the future by teacher regulatory authorities.

The datasets discussed include those that can be readily obtained from available sources (such as Department of Education, Employment and Workplace Relations higher education statistics), data that will need expert specification or manipulation before it can be in a useful form (such as the ABS Census data), data that involves new collections that are relatively straight forward (such as that collected from faculties of education), and data from new data collections that involve significant funding and ongoing commitment (such data from a new longitudinal survey of student teachers). Each will need to be considered on its merits, though the value of most need to be considered in the context of other datasets because of the importance of linking within the DRTE.

New datasets should be able to be incorporated without difficulty.

Conclusions and recommendations

The study found a clear need for the repository and strong support for it. Key organisations are committed to promoting and supporting its wide use once it is established.

In the context of need, administrative possibilities and technical capabilities, the DRTE clearly appears to be feasible in the broad terms set out in this report.

It has been estimated that an effective and efficient DRTE would need annual funding of around $1.5 million to $2.0 million.

It is therefore recommended that the proposal for a DRTE be further advanced through cooperation between the ACDE and the Department of Education, Employment and Workplace Relations (DEEWR) to ensure:

> **Recommendation 1: Budget process** That the DRTE is placed on the agenda for consideration in the process leading up to the 2009 Commonwealth Budget.
>
> **Recommendation 2: Development of specifications** That specifications for the DRTE be further developed as required for Budget decisions. This may include location/hosting of the repository, technical specifications, timelines for development of the repository, including data collection, and determination of responsibilities for preparatory and transitional tasks. Once established, the work of the DRTE should include periodic review regarding the extent to which it is meeting objectives, and consultations with users and data providers regarding their evaluation of the DRTE.

As Budget deliberations occur it may be necessary to consider and seek alternative or supplementary sources of funds. Planning for actual implementation will be necessary once funding is assured.

Introduction

Background to the scoping study proposal

The Australian Council of Deans of Education (ACDE) has been aware for many years of the paucity of large scale, high quality research that could inform policy and practice in teacher education. This deficiency is well recognised by others in Australia, and Australia is not alone (House of Representatives 2007, Murray et al 2008, Cochran-Smith & Zeichner 2005).

The field of teacher education has not had an adequate Australian evidentiary basis upon which to make and justify decisions about the structure, content and quality of courses. There is also a lack of appropriate and accessible longitudinal data that can be used (alongside other evidence) to research teacher education pedagogy and practice and evaluate different models of teacher education, such as approaches to clinical experience, the structural relationship between discipline and education studies, and entry requirements. While there has been good small scale research that has assisted the development of quality teacher education at the local level, there are serious gaps. Similarly, while the Department of Education, Employment and Workplace relations (DEEWR) maintains a systematic higher education statistics collection, and there are other public data collections, those collections have limitations and do not cover some areas crucial for informing policy for teacher education and for teacher workforce planning. As a result, many of the inquiries into teacher education in the past thirty years have had to base their conclusions on limited information and collective opinion rather than on solid evidence about how features of teacher education relate to the quality and sustainability of the teaching profession.

In part provoked by its struggle to provide appropriate evidence to support its arguments and claims to the House of Representatives Inquiry into Teacher Education, the ACDE became convinced of the necessity of overcoming this deficiency in large scale data collections and research. After consideration of the context of advancing technical capabilities and of current and possible future availability of data, the ACDE concluded that an effective national data repository for teacher education (DRTE) could play a major part in filling the gaps, and thus enhance the quality of teacher education and the future development of the teaching profession.

The ACDE has also been aware that while Australian research in the field of education is of very high international standing (ARC 2007, p. 56), the level of expenditure on educational research is very low (ABS 2006a, p. 15). Thus initiatives that could further increase the cost-effectiveness of education research would be welcome by the education research community and those who utilise their work.

In addition, teacher education providers have struggled to meet many legitimate requests for data from external bodies. The human and financial resources expended on responding to multiple ad hoc, often duplicating, and often idiosyncratic requests for data could be better deployed on quality improvement. Yet the required data should be made available to all those who need it. It should be accessible, of high and appropriate quality, and efficiently collected. This could be done through an effective DRTE.

These strands of argument for a DRTE came together in a successful proposal to the Australian Learning and Teaching Council (ALTC – formerly the Carrick Institute for

Learning and Teaching in Higher Education) for funding through its discipline-based initiatives scheme (now grants scheme).

Outcomes the scoping study was designed to achieve

The ALTC funded the ACDE to carry out a scoping study to investigate the *need* and *support* for, and *feasibility* and *specifications* of, a national data repository with systematically managed, accessible and usable data concerned with teacher education and related areas.

The ACDE envisaged the following features of a repository:

- the data in the repository provides the information necessary to support high quality research and practice, and inform important decision-making in teacher education and related areas
- new data collection is not unnecessarily burdensome for providers
- data is collected and organised according to appropriate data standards
- the data repository has a research oriented data model
- data is collected and maintained over the long term
- data is available in a timely manner
- appropriate software ensures that the data is readily and efficiently accessible in a usable and user-friendly form, and can respond to complex queries and immediately provide tables, graphs or maps
- data is readily available to deans of education, education researchers and to others (including the public) on an agreed basis – this indicated that a web-based system would be appropriate.

Scoping study approach and methodology

The study has involved desk research and wide consultations with stakeholders and experts.

The *need* for a data repository for teacher education was scoped through investigation into the adequacy (in terms of content, accessibility, usability and functionality) of current sources of data related to teacher education, the significance of purposes to which data and other material in a data repository could be put, and the capabilities of potential users. In addition to the evidence obtained through desk research and information from experts, the opinions of stakeholders and others regarding the need for such a repository was sought.

Support for the proposed repository was gauged through consultations with stakeholders in teacher education, including potential users of such a repository and those who would be beneficiaries of others' use of the repository.

Feasibility for the proposed repository involves three elements: technical feasibility, feasibility of obtaining datasets that would make the repository worthwhile, and financial feasibility. Advice regarding technical feasibility was sought from experts in the field and by considering developments in data repositories around the world. The feasibility of obtaining appropriate datasets was gauged through consultations with major data custodians, investigations into potential new data collections, and examinations of other potential datasets. Financial feasibility was assessed by the consideration of the likely annual cost of such a repository in the context of funding by governments and others for similar initiatives and activities in other fields, and the professed priorities of governments. In each of these areas, expert advice was sought and provided.

The *specifications* of the proposed repository are in three areas. First are the technical specifications that were largely developed by experts associated with the project, and are concerned with the repository's structure and functionality. The second area specified is the content of the repository, including datasets, guidance material and other information. This was investigated through a consideration of the major areas of data needed and how these can be obtained – whether extracted from existing collections or newly collected. The third area specified is the ways in which effective and widespread use of the repository can be facilitated. Organisations and networks of those who might make use of the repository were consulted, and they indicated a commitment to assist members and associates make effective use of the repository through publicity and training.

Factors of success and impediment

Factors critical to the success of the project included the serious engagement by key stakeholders, in particular ACDE, the Australian Teacher Education Association (ATEA), the Australian Association for Research in Education (AARE) and relevant groups in DEEWR, and the willingness of significant data custodians and experts to provide advice and assistance.

The progress of the project was impeded to some extent by the need to develop broad specifications of the DRTE so that those consulted could make informed and constructive contributions – the specifications could not be developed without input from consultations, but constructive input was difficult without a clearer framework of specification of the proposed repository. The development of internal consultation papers and a public 'Issues Paper' helped break this cycle, but difficulties of iteration remained because of the broad scope of the project and diversity of those engaged in consultations in the context of the necessary limitations of project resources.

As the project progressed an initial uncertainty about the nature and value of the proposed DRTE turned to a high degree of enthusiasm. Of course only the broad specifications of DRTE could be scoped within the limits of time and resources of this study, and further steps need to be taken before it can be brought to reality.

Dissemination and linkages

The immediate outcome of the study is this report. The evidence and arguments in it may be of interest and value to organisations and individuals in Australia and overseas, especially those concerned with teacher education. In its electronic form it can be widely disseminated and its availability on the ACDE website widely publicised.

The most substantial, but not certain, outcome of this scoping study would be the implementation of its recommendations and the establishment of a DRTE. A DRTE has potential to be widely used for the benefit of all teacher education stakeholders, policy makers and others with an interest in teacher education and the sustainability and quality of the teaching profession. It may also provide a possible model for teacher education in other countries and for other fields in Australia that are not already well-served by data repositories and dedicated research institutes.

The project team and contributors to the scoping study

The scoping study was directed by Professor Sue Willis, ACDE President, and Dean of the Faculty of Education, Monash University. Research, consultations and writing were by Barbara Preston. David McGregor (until April 2008) and Lucy Rogers (from April 2008), successive executive officers of the ACDE, administered the project. Consultants with database and data software expertise, George Preston and Jane Gorrie of Prometheus Information Inc, were also involved.

Guidance and contributions were provided by a reference group that included individuals representing diverse stakeholder groups and with extensive relevant expertise and experience. The reference group members were:

Dr Evan Arthur, Group Manager, Digital Education Group, Department of Education, Employment and Workplace Relations

Associate Professor Maxine Cooper, Australian Teacher Education Association (School of Education, University of Ballarat)

Professor Peter Goodyear (Co-Director, CoCo Research Centre, Faculty of Education and Social Work, University of Sydney)

Dr Graeme Hall, Manager, Professional Standards, Teaching Australia

Ms Jayne Johnston, MCEETYA Quality Sustainable Teacher Workforce Working Group (QSTWWG) (Director, Professional Learning Institute, Western Australian Department of Education and Training)

Professor Bill Louden, Australian Council of Deans of Education (Dean, Faculty of Education, University of Western Australia)

Ms Jill Manitzky, Australian Teacher Regulatory Authorities (Manager, Policy, Queensland College of Teachers)

Dr Phillip McKenzie (Research Director, Transitions and Post-School Education and Training, Australian Council for Educational Research)

Associate Professor Jane Mitchell, Australian Teacher Education Association (Faculty of Education, Charles Sturt University)

Professor Jo-Anne Reid, Australian Association for Research in Education (Associate Dean, Faculty of Education, Charles Sturt University)

Professor Peter Renshaw, Australian Council of Deans of Education (Head, School of Education, University of Queensland)

Dr Paul Richardson, Australian Council of Deans of Education (Faculty of Education Monash University)

Ms Katherine Schoo, National Education Forum (Executive Director, Australian Curriculum Studies Association).

In addition to the consultations with reference group members, and, through them, with their organisations and networks, the project engaged stakeholders in teacher education, researchers, and experts in data collections and management. This was done through formal and informal consultations.

Consultations with stakeholders in teacher education and education research included:

- meetings with executive committees and presentations at conferences of the ACDE and ATEA

- informal meetings with executive members of the AARE
- meetings with deans of faculties of education, representatives of school authorities, teacher regulatory authorities and/or teacher organisations in Western Australia, the Northern Territory, South Australia and Queensland
- informal meetings with a diversity of stakeholders and experts from universities and other education institutions, education authorities, and teacher associations at AARE 2007 and ATEA 2008 conferences
- meetings and electronic consultations with officers in DEEWR responsible for areas such as teacher quality, teacher education, early childhood education, vocational education and training, and learning and teaching in higher education, and with others connected with relevant government policy
- electronic consultations with peak nongovernment school authorities, teacher unions and others, who circulated documents and/or consulted with their affiliates and through their networks.

Consultations with experts in relevant data and data repositories included:

- electronic, telephone and face-to-face consultations with DEEWR officers responsible for higher education and school statistics
- electronic, telephone and face-to-face consultations with ABS officers responsible for Census and education and training statistics, and for aspects of data standards and management
- electronic and telephone consultations with DIAC officers
- electronic and telephone consultations with a number of social science researchers with expertise and experience with significant data collections and data standards.

There were some informal communications with other ALTC projects, but the substance of those communications involved matters of general project management and progress rather than the particular content of this scoping study.

We acknowledge with thanks all those who have contributed their time and expertise to this project.

Part 1

Context

1 Context

1.1 Need and support for a data repository for teacher education

Large scale, high quality research to inform policy and practice in teacher education has been strongly advocated overseas and in Australia – recently by the House of Representatives Standing Committee on Education and Vocational Training in its report on the inquiry into teacher education (House of Representatives 2007, pp. 5 – 18; see also Murray et al 2008, p. 235, and Cochran-Smith & Zeichner 2005, p. 5). Such research requires large national databases and longitudinal studies to complement smaller scale and qualitative research.

The advocacy of such large scale research arises from recognition of the importance of high quality initial and post-initial teacher education as a foundation for education from early childhood to post-school education, and the importance of policy at all levels being evidence-based (see for example Gillard 2008). Organisations outside government and the education sector, such as the Business Council of Australia (BCA), have also stressed the importance to Australia's future of education, and, especially, teachers (BCA 2008). Internationally, the Organisation for Economic Co-operation and Development (OECD) has given high priority to investigating policy options for attracting, developing and retaining effective teachers (OECD 2005).

Teacher education students (initial and post-initial) make up 10% of all students and 12% of all domestic students in Australian universities (DEEWR 2008a), and education professionals make up almost 5% of all Australian workers (ABS 2006 Census). Yet only around 1.6% of all Australian research and development expenditure is directed towards education and training objectives (ABS 2006a, p. 15). There has been a particular paucity of large scale research.

Yet Australian education research is of very high international standing. In its 2006 – 07 report, the Australian Research Council (ARC) noted:

> In 2006 Thomson Scientific reported that, for the five years from 2001 to 2005, Australia's share of science and social science papers was 2.91 per cent of the world total. Of the 114 047 research papers indexed that listed at least one author address in Australia, **the highest percentage (5.44 per cent) appeared in journals classified under the heading of education**, followed by plant and animal sciences (5.30 per cent) and geosciences (5.02 per cent) (ARC 2007, p. 56, emphasis added).

In addition, a report of the Research Evaluation Programme of the (then) Department of Education, Training and Youth Affairs, *The Impact of Educational Research*, found that Australian educational research had significant impact to the benefit of education at all levels (DETYA 2000, summarised on pp. 10 – 12).

Thus it is clear that teacher education is an important area and there is great capability among researchers for high quality research to inform policy and practice in the area. Yet there is not the database infrastructure to effectively and efficiently support such research.

The DRTE could play an important part in ensuring quality initial and post-initial teacher education, and thus highly competent and committed teachers of sufficient numbers and distribution. However, it would be only a part; other research and analyses would continue to be necessary, using a diversity of methods and data sources.

An efficiently developed and maintained DRTE would, by lessening (even eliminating) the need for frequent, ad hoc data collections and searches to support discrete research and policy development exercises, free up resources (financial and human) for more substantial research and development exercises, and for implementing policies to improve quality in teacher education, the teaching workforce and the wider education systems.

The proposal for a DRTE has been strongly supported by a wide range of stakeholders in teacher education and the teaching profession. In addition to the Australian Council of Deans of Education, these have included the Australian Teacher Education Association and the Australian Association for Research in Education, government and nongovernment school authorities, teacher regulatory authorities, teacher professional associations and unions. A number of these organisations have resolved to ensure that their members and others are aware of and able to make good use of the repository through publicity and training. Those associated with likely source data collections have also been positive about the proposal, seeing it as a way in which the data for which they are responsible can be more widely used for significant purposes.

1.2 Policy and organisational developments

There are some broad shifts in policy priorities and in administrative, regulatory and policy formation structures at the national and Commonwealth levels. These point to a potential for greater valuing and utilisation of an initiative such as the DRTE, and possibilities for its effective development, management and funding.

The Rudd Government has given high priority to education at all levels and to the importance of basing policy on sound evidence. For example, in her speech, Equity in the Education Revolution, to the 6th Annual Higher Education Summit in Sydney on 3 April 2008, the Minister for Education, Julia Gillard noted that:

> In the view of the Rudd Labor Government, education and training are the keys to Australia's future. . .
>
> We have also begun the process of strategic policy change aimed at making long-term, systemic improvement to our education system, from early childhood development to postgraduate research. . .
>
> We will be a Government that takes impartial expert opinion and evidence seriously before we make important policy decisions (Gillard 2008).

Key areas of policy and organisational priority include teacher quality and supply and demand – ensuring sufficient supply in terms of specialisations and geographic distribution. There have been initiatives and priorities in Indigenous education (especially in remote communities) and early childhood education and care under the auspices of the Council of Australian Governments (COAG) Productivity Agenda Working Group (2008).

The Ministerial Council for Education, Employment, Training and Youth Affairs (MCEETYA) has been working on national datasets relevant to school teacher workforce planning, building on the work in *Staff in Australia's Schools 2007* (McKenzie et al 2008) and *Teacher Workforce Data and Planning Processes in Australia* (Owen et al 2008), which are discussed in Appendix F. The Quality Sustainable Teacher Workforce Working Group (QSTWWG) was established in December 2007 by the Australian Education Systems Officials Committee (AESOC) at the request of MCEETYA. It will 'provide a forum for members to share

information, and raise and deliberate upon matters relating to workforce planning' (MCEETYA 2008).

All these developments in policy and policy formation structures have been underpinned by an appreciation that policy and practice should be based on the best possible evidence, and that ensuring the availability of such evidence is itself part of the process of arriving at optimal outcomes.

Structural developments which may lead to the formation of a suitable location for the DRTE include the review of Teaching Australia, which is being carried out by DEEWR, and the 11 June 2008 MCEETYA decision that an AESOC group develop a proposal for the governance, processes, accountability and quality assurance mechanisms for a national system for the accreditation of teacher education programs These and other possibilities for a location for the DRTE are further discussed in Section 2.1. The research and policy capabilities of such new or reformed bodies would be enhanced by access to the DRTE, whether or not the DRTE is directly associated with them.

There has been a growing appreciation in Australia of the importance of *infrastructure* to support research and development. Data repositories and associated facilities are *infrastructure* (or 'e-infrastructure'), and have the characteristics of an ongoing background operation supporting significant (and more apparent) activities such as research and policy development. Management, development and maintenance of the repository are part of the infrastructure, as are data collection and organisation, promotion of and training in the use of the facility, and much of the analyses and reporting based on the data in the repository. Appendix A considers the DRTE as infrastructure in detail.

The Commonwealth Government has established the Higher Education Endowment Fund (HEEF – which will become part of the Education Investment Fund and also cover VET in 2009) to increase the capacity of higher education to 'enhance teaching, learning and research in areas of national, international and regional importance . . . across all disciplines' (HEEF Advisory Board 2008, pp. 1-2). Around $300 million per annum is expected to be distributed over coming years.

The Review of the National Innovation System, *venturousaustralia - building strength in innovation*, (Cutler 2008) has also advocated greater support for research infrastructure. The review report argued for a reappraisal of the 'architecture' of Australia's national innovation system, and for improving the *capacity* for innovation. Several recommendations are relevant to future support for the DRTE. These include

> *Recommendation 6.13* Establish a National Research Infrastructure Committee to advise on strategic directions in funding of national research infrastructure . . .
>
> *Recommendation 6.14* To ensure a sustainable research infrastructure strategy into the future, extend funding for a successor program to the National Collaborative Research Infrastructure Scheme (NCRIS) for 10 years including capital and operational support of $150 to $200 million per annum. The remit of such funding should explicitly include support for the humanities, social sciences and creative arts as well as the sciences.

HEEF and the Cutler report indicate a context of hundreds of millions of dollars of Commonwealth funding for research infrastructure, within which funding for research infrastructure for a significant area such as teacher education needs to be considered. It is a context in which initiatives such as the DRTE may be supported and flourish.

Teacher regulatory authorities have been or are being established in most jurisdictions. There is some long term potential for the consistent collection of detailed, high quality and accessible data on registered teachers (generally only school teachers) through the teacher regulatory authorities. The teacher regulatory bodies may themselves benefit from the enhanced research and development capabilities that the DRTE may be able to provide.

1.3 Advancing technical capabilities

The technical foundations for a sophisticated, highly useful and cost-effective data repository have been advancing over recent years.

Significant work supporting research, innovation and practical implementation in universities and other national research institutions has arisen out of the 2001 Australian Government initiative, *Backing Australia's Ability*[1], continuing through the National Collaborative Research Infrastructure Strategy Advisory Committee, while many other initiatives are occurring in other spheres.

Support for and dissemination of information about existing data repositories are developing though initiatives such as the ABS-hosted National Statistical Service (NSS)[2].

Datasets that can be interrogated online are developing and expanding internationally, with increasing sophistication of capability and content. Two that are of particular relevance to the DRTE are the United States National Centre for Educational Statistics (NCES), which is the primary federal entity in the US for collecting, analysing and disseminating data related to education[3], and the Online Education Database of the Organisation for Economic Cooperation and Development (OECD)[4].

1.4 Future developments

There will continue to be change and development in the context of research and policy requirements and priorities, newly available datasets, data management and coordination initiatives, and technical capabilities. Therefore flexibility and openness to innovation will be important. In general, the DRTE should be structured so that new datasets can be incorporated and appropriate modifications made to the structure of the repository at minimal expense. It should be conceived as an ongoing resource, not as a 'project' with a finite life.

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[1] http://backingaus.innovation.gov.au/default2001.htm

[2] The National Statistical Service is 'a coalition of agencies that will deliver to Australia an improved range of statistical information for policy, research and decision making'. See <http://www.nss.gov.au/nss/home.NSF/>. The NSS Key Principles are set out in Appendix C.

[3] <http://nces.ed.gov/>

[4] <www.oecd.org/education/database>

Part 2

Location, management funding & structure

2 Location, management and funding

2.1 Location of the DRTE

Currently there is no clearly appropriate location, or 'host', for the DRTE. However, there are several structural reviews, developments and re-organisations involving agencies associated with teacher education and teaching regulation, research and policy development. An appropriate location may be in one of these reformed or new agencies, in an existing agency or organisation, or in a stand-alone body. Several possibilities are considered below; others might become apparent over coming months.

The location of the DRTE within another organisation – a 'host' – has potential advantages of economies of scale and efficiencies, especially in administration, office facilities and accommodation. And there might well be significant synergies in ideas, professional activities and external relations between the DRTE and the hosting organisation. However, there will need to be transparency and accountability regarding the DRTE's funding and other resources.

The organisation hosting the DRTE will need to have the following features if the DRTE is to be of value, well-used and cost-effective:

- a mission that is based on the public interest (thus not-for-profit)
- a connection with understanding of teacher education and its stakeholders
- independence from governments and particular interests in teacher education or the teaching profession (though an independent board governing the DRTE itself may overcome a real or apparent lack of independence of the hosting organisation)
- a culture that is supportive of quality research
- a commitment to facilitating effective, evidence-based policy
- an understanding of the nature of data repositories, their needs and functions
- openness and a welcoming approach to wide and effective utilisation of the repository
- innovative and dynamic.

Whatever core functions of the hosting organisation, it must welcome and support the DRTE. The DRTE should not be foisted on an unwilling host.

Some possibilities for hosting are discussed below.

The yet-to-be established body for the national accreditation of teacher education programs At its 11 June 2008 meeting, MCEETYA resolved that an AESOC group 'develop a proposal for the governance, processes, accountability and quality assurance mechanisms for a national system for the accreditation of teacher education programs'. The location of the DRTE within such an organisation would be mutually beneficial. The scope of the DRTE content would be wider than that directly relevant to program accreditation, but would provide a context for and inform work that the accrediting body may do to support innovation and development in teacher education, and to enhance its effectiveness within the overall Australian education system. In particular, the DRTE would cover data concerned with post-initial as well as initial teacher education, and teacher education of teachers for all levels and sectors, not just schools. However, an accreditation body would surely consider

initial school teacher education within the wider context of professional learning throughout the careers of teachers in all education sectors.

A revamped Teaching Australia Teaching Australia is currently under review. It has had a stated mission of representation of and support for the teaching profession (primarily the school teaching profession, including school leaders), as well as research, review and developmental work regarding the work and regulation of the profession. While under current arrangements, Teaching Australia does not appear to be an appropriate host for the DRTE, it could be so if its mission was modified and it was appropriately restructured so that its scope extended beyond the school sector, it had an increased emphasis on research and development, and the basis and legitimacy of any representative role was clarified.

A centre or unit within an existing organisation Such an existing organisation may be a university, and a parallel could be the Australian Social Science Data Archive, which is part of the Australian Demographic & Social Research Institute (ADSRI) in the Australian National University (ADSRI has an external advisory board). Other possibilities are centres or units within existing statistics or research organisations. In any such cases, funding for the DRTE would be independent of the budget of the hosting organisation.

The DRTE could also be established as **an autonomous, independent organisation** under its own legislation or created as a public company.

2.2 DRTE management, administration and development

Whatever its location and hosting arrangements, the DRTE itself would need a management structure, such as a council or board, that involves stakeholders in teacher education and experts in data repositories. This would help ensure that the content, structure and capabilities of the DRTE are fully up-to-date and meeting needs. Involvement of stakeholders in teacher education also helps ensure that the DRTE is well known and utilised, with active access to the data and reports.

The DRTE would require staff (and associated consultants) with relevant professional and technical expertise in data repositories and in the substantive areas of teacher education, the teaching workforces and related matters. Staff would be required to maintain an ongoing investigation into possible data sources. They would need to negotiate access to data or arrange collection of data, prepare the data for placement in the repository and draft associated documentation. Judgements will need to be made on the value of data for the repository, and how it can be structured to optimise its value for users. Technical and research reports would be prepared by staff (or consultants) on a routine basis and as particular policy or other needs arise. Publicity about the DRTE and training in its use will need to be carried out – by the DRTE independently and in partnership with organisations associated with teacher education, education research, and the teaching professions.

Some activities, such as the proposed longitudinal surveys of student teachers, and some other data collection (and analysis) exercises, could be carried out by external agencies (or consultants). This may have benefits of clearer divisions of responsibility and accountability, as well as utilisation of external expertise, but may lose economies of scale in administration, and may lose synergies and productive integration in project definition and data analysis and research. The DRTE itself carrying out most significant activities (involving external consultants where their particular expertise or capabilities are relevant) may be optimal, but would require clear management of activities and internal accountability.

Once established, the work of the DRTE should include periodic review regarding the extent to which it is meeting objectives, and consultations with users and data providers regarding their evaluation of the DRTE.

2.3 DRTE funding

The source of core funding for the DRTE must support long-term sustainability and the reality and appearance of impartiality. Thus it would be most appropriate for the Australian Government to provide assured ongoing core funding for the DRTE. The mechanism or route for this funding would depend on the location of the DRTE. The funding could be a separate line item, a specified component of funding if within a particular entity such as those discussed above, or, if located appropriately, the DRTE could receive funding through HEEF or some other major research and innovation infrastructure funding scheme.

The budget of the DRTE would need to cover the overall administration and activities noted above. It would also need to cover the purchase and collection of data. The purchase and/or licensing of existing datasets may be in the order of $2,000 to $10,000, with a small number of such purchases made each year. Collections of new datasets from higher education providers (HEPs) and others, and the organisation of the data, may be the order of $40,000 to $80,000 for each collection (whether carried out by consultants or in-house). There may be one or two such collections a year. Major new datasets, such as an ongoing longitudinal study of student teachers, may cost in the order of $800,000 a year (see section 5.2) for data collection and organisation and the preparation of technical, research and analysis papers.

A broad estimate of the possible cost of an effective DRTE would be in the order of a minimum of $1.5 million to $2.0 million a year. This estimate is based on the cost estimates noted above, and information about the funding of activities of similar scope.

3 DRTE structure

It is assumed that the repository will be accessible via a website, and that associated with the repository are staff (and/or consultants) with relevant professional and technical expertise in data repositories and in the substantive areas of teacher education, the teaching workforces and related matters.

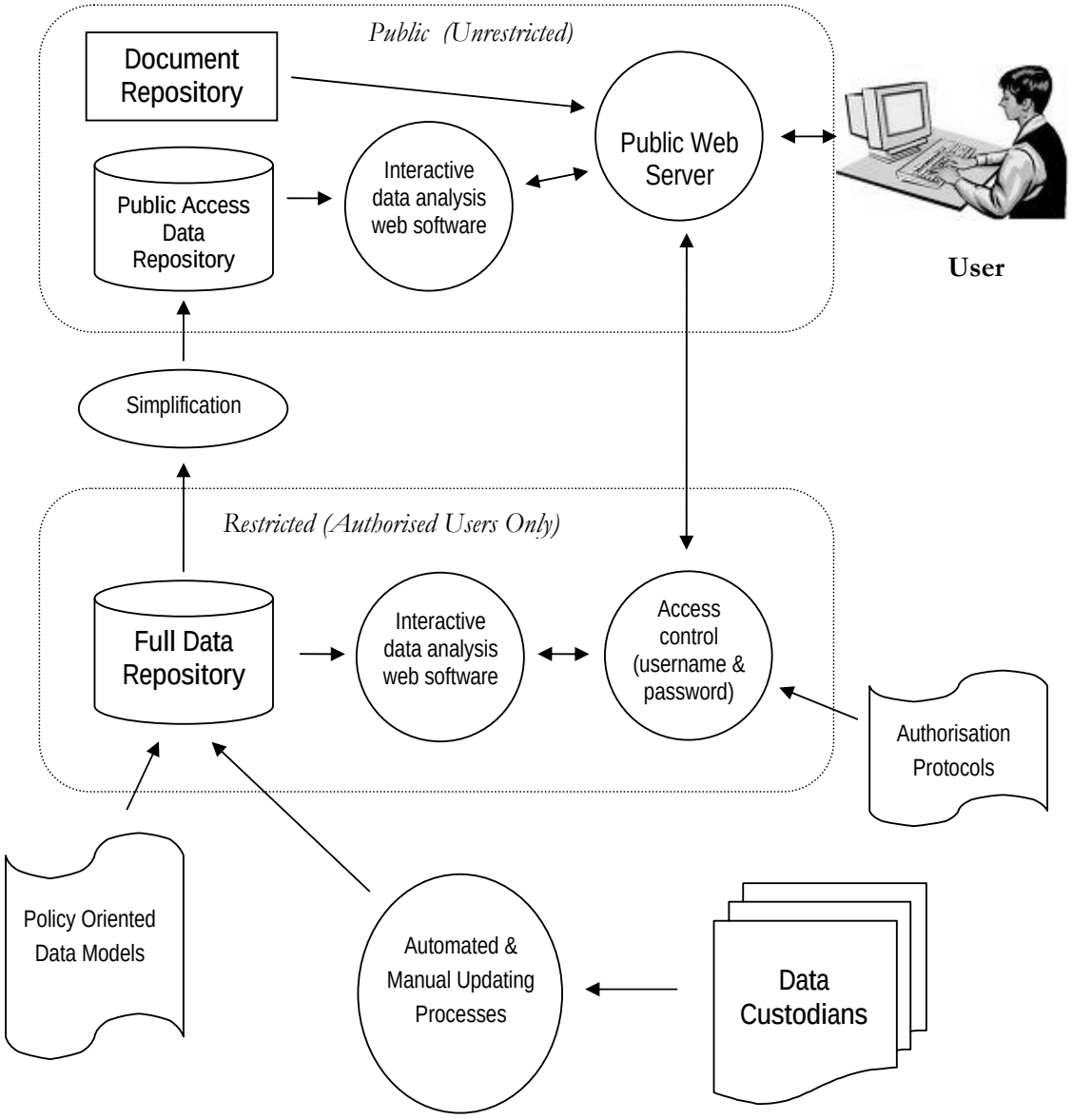
A draft structure for the website through which the DRTE is accessed is set out in Figure 1.

The initial interface with the user would be welcoming and include directions to the Document Repository, the Public Access Data Repository and the Full (restricted access) Data Repository. It would have a description of the site as a whole and the nature and purposes of the data repository.

The **Document Repository** would contain several types of documents, most of which would be in PDF format, some may be in simple spreadsheets in Excel format, and could include:

- guides to the data on the website
- a statement of principles – see section 4.1
- metadata guides, manuals, data dictionaries (and hyperlinks to further reference material, on, for example, the Australian Bureau of Statistics website) – see Appendixes B and C
- online tutorials and information about training programs in the use of the repository, for example, those that may be run on a regular or ad hoc basis by organisations such as the Australian Teacher Education Association (ATEA) and the Australian Association for Research in Education (AARE)
- prepared tables (generally in Excel or as PDFs) of commonly sought data, with all necessary information on the data and sources so that they can be incorporated in research or policy documents or made immediate use of in policy or general information provision (such as use by journalists). Such tables and associated documentation generally would be prepared on a regular and ongoing basis by the staff of the repository, or by consultants.
- technical reports on the relevant data collections (such as reports covering sample selection methods, response rates, survey questionnaire facsimiles, and so on for datasets from a longitudinal study of student teachers)
- research reports based on data in the repository (prepared by staff or consultants associated with the repository, or by others who have made use of the repository and whose reports would be accepted after an appropriate review process).

Figure 1 DRTE website graphic representation



The **Full Data Repository** would include data that is appropriate to access only with authorisation (see below), as well as other data common to the Public Access Data Repository (see following). Data would be in data cubes or SQL[5] databases, and accessed using interactive data analysis web software once authorisation had been obtained. Datasets can be

[5] Structured Query Language, an ISO standard interactive and programming language for querying and modifying data and managing databases.

linked through common fields containing common items. Suggested content for the data repositories and possible linkages of datasets are discussed in section 6.

The **Public Access Data Repository** would include data that is readily usable, straight forward to interpret and involves no issues of potential breaches of confidentiality/privacy or significant misuse or misinterpretation. It would be immediately accessible by anyone with access to the internet. The data would be in a similar format to that in the Full Data Repository, and would be drawn from datasets in that repository. In some cases the datasets would be identical, in others the dataset in the Public Access Data Repository would be a simplified or edited version of that in the Full Data Repository. Simplification could involve, for example, simplifying 'age' from date of birth (over 20,000 categories) to age ranges (as at 30 December, say) such as 0 – 19, single year 20 – 64, and 65 and older (46 categories), or 0 – 19, five year ranges 20 – 64, and 65 and older (11 categories).

The user would experience using **Interactive Data Analysis Software** similarly to using pivot tables in Excel or downloaded data cubes that are in Summary Record Database (SRD) format from the ABS website and analysed using SuperTABLE software (from Space-Time Research) which can be downloaded for free from the ABS site[6]. As well as tables and graphs, maps could also be prepared if appropriate geographic information (such as postcodes or latitude and longitude references) is included in the datasets, and the software includes a mapping element. The software needs to allow users to specify the manipulation and analysis to be performed on the data. The range of tasks includes:

- defining a subset of data to be extracted and downloaded
- creating new variables to be defined and incorporated in the user's view of the data
- allowing the user to specify tables, graphs and maps to be created from the data
- linking datasets to create new outputs for specialised analysis[7].

The **Authorisation Protocols** would be appropriate to the nature of the datasets in the Full Data Repository. This may involve registration and an undertaking covering matters such as appropriate use of the data, no use of the data (in combination with other datasets) to attempt to identify individuals, no transmittal or access to the data by those not authorised, no commercial gain, and appropriate acknowledgement of the data and its source[8].

The **Updating Processes** will usually be manual, and carried out by staff or consultants associated with the repository working with external data custodians or freely available external datasets. However, automatic processes could be developed for some datasets.

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[6] ABS data in SRD format includes some tables from *Schools, Australia, 2006* (Cat. No. the 4221.0) at http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4221.02006?OpenDocument>. Information about SuperTABLE is on the ABS site at <http://www.abs.gov.au/AUSSTATS/abs@.nsf//web+pages/Download+Install+SuperTABLE+Software>.

[7] There are two kinds of linking. First, linking at the unit record level (by matching the person/entity the data relates to, for example, by a unique identifier or a linking algorithm) – this is necessary for any longitudinal study as particular individuals are followed over the years, and may involve privacy issues. Second, linking data files by shared characteristics (age, postcode, course, institution, etc). This generally would not involve privacy issues.

[8] For an example of such an undertaking see that of the Australian Social Science Data Archive at <http://assda.anu.edu.au/forms/GeneralUndertakingnon-ACSPRI.pdf>.

Data Custodians are those responsible for the original data from which the repository's datasets are drawn, and with whom the processes and conditions for obtaining the data would be negotiated. Such custodians could include faculties of education, those responsible for higher education and schools statistics in DEEWR, those responsible for Census and schools data in the ABS, and those responsible for data on permanent and long term overseas arrivals and departures in the Department of Immigration and Citizenships (DIAC).

The **Data Models** used to structure and access the data would be **Policy Oriented**. That is, the structure and ways of accessing the data would be that suitable for research and policy concerned with teacher education and related matters.

Part 3
Data standards & content

4 Data principles and standards for the DRTE

4.1 Principles for the DRTE

The DRTE should operate according to the appropriate principles and standards.

The National Statistical Service (NSS), which operates under the auspices of the ABS, has a set of 16 principles, which draw from the 1994 United Nations Fundamental Principles of Official Statistics and more recent international frameworks for describing the quality of data. These documents are reproduced in Appendix C. The NSS principles are under the headings of:

- Statistical integrity
- Relevance
- Coherence
- Timeliness
- Accessibility
- Interpretability
- Accuracy
- Statistical professionalism
- Trust of data providers.

The NSS and UN principles are concerned with official statistics. The DRTE would need to generally adhere to these principles, and to augment or amend them in some areas. A statement of principles should be developed and made readily accessible as part of the DRTE. Some augmented and amended principles include the following:

- **Value** This is similar to the NSS principle of 'relevance', but requires a sharper focus. The content and its organisation in the DRTE must be appropriate and valuable for significant purposes (primarily related to teacher education – both initial and post-initial, for teachers in all levels and areas of education). The data and information should be able to meet the information needs of specific significant purposes without leaving gaps (that cannot be filled readily from other sources). That is, the DRTE's value would be diminished if it did not provide adequate infrastructure for significant, relevant purposes. Such purposes could include (but are not limited to) evidence-based improvement of teacher education; management of student demand, recruitment and retention in programs; teacher workforce planning, both qualitative and quantitative, and at macro and micro levels; academic workforce planning and human resource management within faculties of education; and quick and efficient access to data in response to ad hoc needs.
- **Utility** The repository must be accessible and user-friendly so it does in fact get used. Ensuring utility involves the content and structure of the repositories, the nature of supportive and interpretive material that are part of the repository, and publicity, training and support for potential users. Testing the DRTE's ease and effectiveness of use with real potential users, rather than experts, ('usability testing') may be helpful at the establishment phase and periodically afterwards as the repository develops in response to new needs, new datasets and new technical capabilities.

- **Feasibility** The repository must be technically and financially feasible (and cost-effective) in establishment and long term development and maintenance.
- **Sustainability** The repository must be sustainable in several senses. It should be ongoing, not a project of limited life. Its use (the outcomes of its use) should be of long term, non-trivial value. It should be of broad value across disciplines and areas by providing a model that others may learn from as well as providing a resource that can be widely used, including adding value to other existing and future data repositories though links and common elements.
- **Maximising the net benefits to data providers** This is consistent with the NSS principle of 'trust of data providers', but goes beyond it, and is particularly relevant to the providers of data that is not already collected (rather than custodians of established datasets). In accord with the NSS principle, data collection should be of minimal possible burden. There should also be adherence to ethical principles of ensuring providers are fully informed about the data collection and potential uses of the data, and compliance with privacy principles. The data-collection processes should be well-organised and take account of the other commitments of providers (such as particularly busy periods in HEPs). Efficient collection of data for the DRTE from providers such as HEPs should obviate any need for demanding and inefficient duplicating data collection by other agencies and individuals. Benefits to the providers of the data when it is included in the DRTE should be assured as far as possible. Providers should be kept informed of the preparation of the data, its availability in the DRTE, and any reports prepared utilising the data. The data providers may then be able to utilise the data and analyses that arise, or its use by others may benefit them.

Summary principles for the DRTE's datasets may well be that data should be collected with great efficiency and care, and its effective use for significant purposes maximised: 'collect it once, use it often'.

4.2 Standards for DRTE data

Datasets should, as far as possible, use classifications and definitions that are consistent, publicly recognised and commonly used. This is important for the quality of the data, common understandings of the meanings of the data, and for the linking of datasets for more useful and complex analyses. It is also important for effective linking of data in the DRTE with data arising from significant international research initiatives[9].

The DRTE could play a significant role in facilitating the understanding of and use of recognised data standards and classifications among Australian educational researchers and policy-makers. It could also ensure the development of appropriate standards and protocols for data related to teacher education where such standards and propocols do not already exist.

[9] Such initiatives could include the OECD's Teaching and Learning International Survey (OECD 2008), which focuses on the learning environment and working conditions of teachers in schools, and the International Association for the Evaluation of Educational Achievement's Teacher Education and Development Study in Mathematics (TEDS-M) (IEA 2008), which is a comparative study of teacher education with a focus on the preparation of teachers of mathematics at the primary and lower secondary levels. The Australian Council for Educational Research is involved in both these studies, though Australia is only participating in (that is, providing data to) the OECD study

This would have parallels with the work of the Australian Institute for Health and Welfare (AIHW) and the National Centre for Vocational Education and Research (NCVER) regarding data in their respective fields. Undertaking such leadership roles would significantly add to the value of the DRTE.

Appendix B outlines issues concerned with data standards and metadata, and describes many of the published classification standards used in Australia, and common measures of factors that may be important in the DRTE.

There are, however, problems with some existing standard data classifications. Notably, the Australian Standard Classification of Education (ASCED) is not adequate for many significant purposes related to teacher education and the teaching profession. These problems and possible solutions are discussed in Appendix D. In general, the appropriate solution to such difficulties is to augment existing standards by adding new subclassifications, rather than changing existing recognised classifications.

Data in existing sources such as DEEWR and the ABS will generally conform to the appropriate recognised standards. However, only extracts will be placed in the DRTE, so the protocols for extracting the data from the original source and for structuring it within the DRTE will need to be according to appropriate standards, and the protocols clearly documented on the DRTE.

New collections will need to be consistent wherever possible. This involves the full process from the drafting of items on forms or survey questionnaires to the coding and organisation of collected data.

5 Content of the DRTE

Possible content for the proposed DRTE is discussed in detail. This is in order to give a clearer picture of the nature and potential value of the DRTE so that decisions about whether and how to establish it can be better-informed.

Possible content is considered in this report under three broad headings.

Core datasets, which would be drawn from existing datasets or new collections of potential high value and not great collection cost. There are a large number of such datasets. Some are potentially very extensive and complex, while others may be just a small number of simple spreadsheets.

An ongoing longitudinal study of student teachers, which would be of very high potential value, but which needs careful consideration and planning and will be of relatively high ongoing cost if it is to be of optimal value.

Optional datasets and datasets for future consideration, including a wide range of possible data collections – such as data arising from research carried out for other purposes, data that might be collected in the future by teacher regulatory authorities, and many other possible sources.

The datasets discussed in this section include those that can be readily obtained from available sources (such as DEEWR higher education statistics), data that will need expert specification or manipulation before it can be in a useful form (such as some of the proposed ABS Census data), data that involves new collections that are relatively straight forward (such as that proposed to be collected from faculties of education), and data from new data collections that involve significant funding and ongoing commitment (such as the proposed longitudinal survey of student teachers). Each will need to be considered on its merits, though the value of most need to be considered in the context of other datasets because of the importance of linking within the DRTE.

The features of the DRTE should be such that new datasets can be easily incorporated – in the longer term if not immediately or in the short term.

5.1 Core datasets

The core datasets of the DRTE would include data from the DEEWR higher education collection, data on student teachers collected from HEPs, DIAC data on international movements of teaching professionals, ABS Census data, and data from various other sources on teacher education students and graduates, and teachers. Some of the datasets suggested here may, after investigation, be considered of lesser priority or have a high level of difficulty of collection, and thus be considered as optional or for future consideration (see section 5.3), and there may be other datasets that could be considered 'core'.

5.1.1 Introduction to DEEWR data

DEEWR collects and maintains very large datasets on students, and smaller but still substantial datasets on staff, research and finance in HEPs[10]. Selections from the datasets are available (a) in publications that can be downloaded as PDFs or Excel spreadsheets from the DEEWR website, (b) as aggregated datasets that can be downloaded from the DEEWR website and interrogated with software such as SAS or SPSS, and (c) for purchase as custom tables.

The most appropriate procedure would be to work with DEEWR to determine the optimal content and format, and to develop a memorandum of understanding to ensure regular delivery of the required data on an agreed basis.

DEEWR data is maintained according to recognised standards and classifications (see Appendix B) and according to classifications developed for DEEWR's own purposes that are aligned with the public classifications - such as the 'academic organisational unit group' (AOUG) classification for academic units such as faculties, schools and departments, and the 'special course type code' for initial (or pre-registration) courses of professional education in teaching, nursing, medicine and some other special categories.

5.1.2 DEEWR student and course data

DEEWR collects student data from universities with individual identifying information (student identification number). The data for students obtained for the DRTE would be in unit record files, without the individual identifiers. However, the full datasets would be maintained in the restricted ('full') repository within the DRTE because, if the data was connected with data from other sources, it may still be possible to identify students who have, for example, unusual personal attributes and who are enrolled in courses with small enrolments. Simplified datasets would be derived from the full datasets and placed on the public repository within the DRTE.

Course data would probably be best collected with student data in the same datasets, but may be extracted without student information for various purposes, such as linking with data collected as part of a longitudinal survey of student teachers (see section 5.2), or to link with data that may be developed as part of national accreditation of teacher education, or a range of possible research projects investigating the nature of teacher education courses.

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[10] Information about DEEWR higher education data (students, research, finance, and staff) and links to publications and datasets is on the DEEWR website at <http://www.dest.gov.au/sectors/higher_education/publications_resources/statistics/default.htm>.

Some of the important variables in the DEEWR student data files include:

- Institution attended
  - higher education provider (HEP - the name of the university or other provider)
  - campus name
  - campus location (postcode)
- Course
  - course name
  - course type code (field of education)
  - special course type code (whether, for example, it is initial teacher education)
  - level of course (for example, bachelor (honours) degree, graduate diploma, or master degree by coursework)
- Student attendance
  - if enrolled in a combined course of study
  - type of attendance (full time or part time)
  - mode of attendance (internal, external or mixed)
  - if commencing
  - if completed (collected separately from enrolment data, and will not include data for students who have withdrawn or deferred)
- Unit of study
  - unit of study code (narrow discipline group; field of education)
  - (effective full time student equivalent load, EFTSL, for fields of education is derived from unit of study data)
- Student personal attributes (not all are relevant to all students, and some, such as 'permanent home residence', may not provide meaningful data for many students)
  - sex
  - date of birth
  - citizen/resident indicator
  - country of birth
  - year of arrival in Australia
  - language spoken at home
  - if Aboriginal and/or Torres Strait Islander
  - prior studies/exemption
  - whether previously attended a HEP
  - disability
  - location of term residence (postcode)
  - location of permanent home residence (postcode).

There are some problems with the field of education classifications of the courses and units of study in which students are enrolled. These problems are both inherent in the actual categories in the ASCED classification (for example, there is no 'middle school' category or secondary specialist classifications), and in the nature of some courses and units (for example, students enrolled in one particular course may be preparing to be either or both secondary and adult VET teachers). The problems with the DEEWR collection entail the need to collect some student data directly from faculties of education in HEPs. This is discussed in section 5.1.5 below. Appendix D sets out the ASCED categories, discusses the problems in

the DEEWR collection, and sets out a draft classification of teacher education specialisations (initial and post-initial) and guidance for data collection.

5.1.3 DEEWR academic staff data

DEEWR collects data on academic staff from HEPs. For the DRTE the key classification is the AOUG, which may be either a narrow discipline group (a four digit code such as Teacher Education or Pharmacy) or a broad discipline group (a two digit code such as Education or Health) classifying an academic organisational unit such as a faculty, school or department. The AOUG classifications are determined according to DEEWR guidelines, using Academic Organisational Unit (AOU) information provided by the HEPs, and take account of the mix of student load according discipline groups (narrow and broad) within the unit. If 70% or more of the student load attributed to the unit is accounted for by one narrow discipline group, then the AOUG code is identical to the code for that narrow discipline group (such as 'teacher education'), but if no single narrow disciple group accounts for at least 70% of the student load, then the unit is coded to the broad discipline group (such as 'education') that accounts for the largest share of student load.

The most recently published DEEWR staff collection (2007) has some anomalies, reflecting, perhaps, unusual structuring of disciplines within AOUs, or miscoding. In most HEPs with large numbers of students in the broad discipline group of 'education' there are around 25 to 35 'education' students (equivalent full time student load – EFTSL) to each full time equivalent (FTE) academic staff member classified as being in an 'education' AOUG. However, in several HEPs with around a thousand EFTSL 'education' students there are no (or fewer than ten) academic staff classified as being in an 'education' AOUG, yet these HEPs have units with the title of 'school of education' or similar. These cases (and some other anomalies) may be the result of classification errors that will be corrected in future years. However, the AOUG classification will always need to be treated with caution, especially at the individual HEP level.

With that caution in mind, DEEWR academic staff data may still be of great value for research and policy purposes related to teacher education, including academic workforce planning. Some of the important variables in the DEEWR academic staff data files include:

- AOU (from which the staff members' AOUGs are determined)
- sex
- date of birth
- appointment term
- work contract
- current duties classification
- function ('teaching', 'teaching and research', 'research only' or 'other')
- whether Aboriginal or Torres Strait Islander
- highest qualification
- place of highest qualification
- main language spoken at home
- country of birth.

5.1.4 Other DEEWR data

DEEWR also collects data from HEPs on finance and on R&D expenditure.

The finance data is for each HEP, and not disaggregated by AOUG or discipline/field of education.

The research expenditure data is classified according to the definitions and standards used by the ABS for the Research and Experimental Development collections (see Cat. No. 8112.0) and form part of those collections – which are based on surveys conducted in accordance with standard guidelines promulgated by the Organisation for Economic Co-operation and Development (OECD 2002).

The ABS collection includes R&D carried out in the business, government and private non-profit sectors as well as the university sector, but the ABS does not publish data for individual universities/HEPs, but only down to the level of states and territories. The DEEWR data is provided for each HEP.

The data on R&D expenditure is provided according to the classifications of 'socio-economic objective' (including 'education and training'), and 'research fields, courses and disciplines' (RFCD) (including 'education'). See Appendix B for details on the two classifications and related matters of R&D data collection.

Data on R&D expenditure is also classified according to:

- type of activity – pure basic research, strategic basic research, applied research, or experimental development
- source of the funds – Australian competitive research grants which may be Commonwealth schemes or non-Commonwealth schemes; other Australian sources which may be state/territory and local government, other Commonwealth Government, business enterprises, general university funds (GUF), or other; or overseas
- type of expenditure – land and buildings, other capital expenditure, direct labour costs, scholarships, or other current expenditure.

5.1.5 Enrolment data collected directly from HEPs

Faculties of education experience high levels of demand for student data that is not part of the DEEWR collection (or is not classified in the DEWR collection in a useful way). These requests, from school authorities and others, are ad hoc and uncoordinated. There are often multiple requests from different agencies seeking similar data, but using different definitions, formats and methodologies. Meeting such requests is a highly inefficient use of education faculties' human and financial resources. Yet the need for the data is genuine and significant.

The most commonly sought data covers the teaching specialisations of completing student teachers (or, more problematically, commencing or all student teachers). This covers the level of education being prepared for (such as early childhood, primary, secondary, or VET), and specialisations, especially, but not only, secondary subjects. The former are part of the FoE classifications used by DEEWR for courses (see *Australian Standard Classification of Education* (ASCED) (ABS 2001a, p. 150). However, a number of courses include students preparing for different levels (such as some students preparing to be primary teachers, and others in the same course preparing to be secondary teachers), and some students may in fact have specialisations that qualify them to teach at different levels (such as secondary *and* VET, or primary *and* secondary). The ASCED does not have a 'Teacher Education: Middle School' classification, and those undertaking such as specialisation would properly be classified as 'Teacher Education, not elsewhere classified'. Another complication involves the different qualifications within the early childhood specialisation that are not recognised in ASCED, notably the 0-5 specialisation that does not qualify to teach in primary schools, the 0 – 8 and

3 – 8 qualifications that do qualify to teach in both before-school settings and primary schools, and 5 – 8 which qualifies for primary school teaching, but (strictly) not for teaching in before-school settings. These distinctions are becoming very important as increasing priority is being given to early childhood education in before-school settings.

With some minor exceptions, DEEWR-collected data does not permit accurate enumeration of completing students by specialisation (maths, or English, or Japanese, say). Yet such data can be of great policy importance for university course development and academic recruitment, as well as school authority workforce planning.

Appendix D is concerned with classification and methodological issues related to student teacher specialisation data. The experience of a DEEWR (DEST) EIP project (Ballantyne et al 2002) that collected such data and other exercises could be built on.

In addition to the initial teacher education data, there may also be information on post-initial teacher education courses and students that is of great value for significant planning and evaluation purposes, but is not part of the DEEWR collection.

Initial and post-initial student data collected directly from universities should be compatible with the DEEWR higher education statistics collection as far as possible, and organised in the DRTE so that it can be combined and manipulated with other datasets.

University student administration software may, in many cases, make collection of all or most of the necessary data a straightforward exercise. And, if this is currently not the case, development of the classifications in the system, and the ways students are classified and data entered, may make it so in the future. An effective and professional DRTE could work with HEPs on the development of data systems to ensure their optimal value beyond internal HEP purposes and DEEWR requirements.

5.1.6 Projected completions by broad specialisations from HEPs

An important component of effective workforce planning is modelling future teacher supply and demand, and that requires projections of completions of initial teacher education programs for around five or so years into the future. Usually completions with primary, secondary, and/or early childhood qualifications are differentiated (see, for example, Preston 2000). Such projections data is also useful for HEPs' own planning purposes – for example if some are planning to significantly expand or contract in particular areas, others can plan to compensate in the context of overall expected demand for places by students and demand for graduates by potential employers.

It is difficult to develop useful projections of future completions using DEEWR data. There are several reasons for this. First, DEEWR data does not always include key disaggregation such as primary and secondary, or secondary and VET (see previous section and Appendix D), which are essential for projections for workforce planning purposes. Second, initial teacher education (like initial nurse education, and unlike initial medical education) has high rates of apparent and real attrition, of transfers between institutions and programs, and of changes in type of attendance (such as from full-time to part-time). Thus reasonable estimates of future completion numbers from particular programs cannot be estimated with accuracy from current enrolments. Third, data on recent enrolments and completions provides no indication of future plans for course establishment or termination, expansion or contraction, or changes in important specialisations.

Usually faculties of education are able to provide reasonable estimates for future completions according to classifications necessary for common workforce planning purposes.

Such projections are not 'hard data', and estimates may be made with more or less confidence, depending on the nature of courses and students involved and the further into the future the projections are made. However, estimates made by those most closely involved with the courses will be of better quality than estimates made by those external from the institutions using 'hard data' of recent enrolments (commencements and completions). Therefore the judgements of informed teacher educators and faculty administrative staff would be the best source of such data.

This data may not need to be collected on an annual basis, but, when it is, the collection should be done and the data presented in a way that permits continuity of series with data on actual completions collected from HEPs and/or DEEWR.

5.1.7 Graduate Careers Australia

Graduate Careers Australia (GCA, formerly the Graduate Careers Council) data is important in understanding graduate destinations, where initial (and post initial) teacher education graduates' destinations can be compared with those of graduates of other courses. However, the graduate destinations survey data does need careful interpretation – because, for example, in recent years almost a quarter of initial teacher education graduates (survey respondents) are not working full-time when surveyed around four months after completion, though many will be taking up full-time work some time within a few years.

All GCA's annual files are stored at the Australian Social Science Data Archive (ASSDA), those from 1989 in SPSS format. Some data is freely available on the GCA website; detailed published reports and custom tables are available (generally for a cost).

The GCA is also carrying out research into the plans and expectations of university students, and the links between students' university experiences and their employment – the 'University and Beyond' survey. In 2007 around 32,000 responses were received, and responses from Education students were roughly proportional to their representation within total student numbers (GCA 2008, p. 2) – around 1 in 20.

5.1.8 National data on undergraduate applicants, offers and acceptances

DEEWR is working with tertiary admission centres (TACs) in each state and with universities to develop the National Data Collection for Undergraduate Applicants and Offers. In April 2008, DEEWR reported on 2008 data (and that of some previous years) and provided additional contextual information on applicants and offers for university places (DEEWR 2008b). This is the first edition of a new annual report, and includes statistics (national and by state and territory) on number of applicants, number of offers made, number of offers accepted, level of unmet demand, analysis of trends in key fields identified as areas of skill shortage, a review of offer and acceptance rates on key applicant demographics, and information on factors affecting current and future demand.

This report is similar to Universities Australia (formerly the AVCC) 'unmet demand' survey reports published since 2001 (UA 2008, p. 2).

There are limitations in the data on undergraduate applicants and offers from TACs (and thus reported in these DEEWR and UA documents). For 2006 only about 60% of initial teacher

education commencements were picked up in the TAC data published in the reports (more recent DEEWR commencements data with which to compare the TAC-derived 2007 or 2008 data is not yet available). This reflects the lack of inclusion of (a) applicants for post-graduate initial teacher education programs (increasing from 21% in 2005 to 25% in 2006, according to DEEWR published data), (b) overseas student applicants (around 5% of commencements), and (c) direct applicants (around 15% of successful domestic, undergraduate initial teacher education applicants in 2006).

From 2010, information on the number of direct applications will be available in the National Data Collection for Undergraduate Applicants and Offers, but those applying for post-graduate initial teacher education courses and overseas students will still not be included. Even so, it is valuable data – indicating unmet demand and the scope for increases in intakes and how this varies between the states. This would be valuable information for universities, school authorities and others considering the attractiveness of teacher education programs and teaching careers, and priorities to be given to the development of new initiatives.

5.1.9 ABS Census data

The ABS Census data that is most relevant for the DRTE is that on those with teaching qualifications as their highest qualification, and those in the 'education professionals' occupations. Data for other individuals may be important for comparative purposes.

Data for those with teaching qualifications (as their highest qualification), whether teaching, in other employment or not in the workforce etc, by age and state/territory or finer locational classification, is one of the most powerful indicators of net 'attachment' to (or 'separation' from) the teaching profession – for those of different ages and for the profession as a whole. Estimates of net separations by age make up one of the most difficult but important components of workforce planning (Preston 2000, pp. 35-36), and the matter of 'retention' in the profession is a frequent issue of topical controversy and policy significance. Additional information on, for example, sex, income, alternative occupations, place of usual resident five years earlier, hours of work, and/or family structure could substantially add to the richness and usefulness of the data. Such data, especially if linked to or considered in the context of DIAC data on international movements of teachers (section 5.1.11) and GCA data on initial teacher education graduate destinations (section 5.1.7), would help clarify the longer term destinations of teacher education graduates, be valuable for planning post-initial teacher education, and inform a range of matters related to teacher workforce planning.

Not all qualified teachers have their teaching qualification accounted for in the Census (their highest qualification may not be their professional teaching qualification), so parallel data for those working in 'education professionals' occupations (where, for example, 'school teaching' is further classified according to schooling level and 'special education teachers') would also be valuable. The Census data provides detail on age, home location and other personal attributes that is not available in the National Schools Statistics Collection (NSSC, section 5.1.10) – though of course the Census is only once every five years, and does not provide school sector and other information available from the NSSC.

Teacher education and workforce planning in early childhood education and care are of vital policy importance at this time. Census data on early childhood teachers (in nonschool settings and in schools) and on all those with early childhood teaching qualifications is generally not of the quality of the data for school teachers and those with school teaching qualifications, but it may well still be of sufficient quality to be a significant value.

Obtaining the relevant Census data would require careful specification for ordering as custom data from the ABS, or (for 2001 and 2006 Census data) work by an expert subscriber to ABS Table Builder[11].

ABS requirements and conditions regarding public accessibility of Census data must be taken into account. If the data is obtained from the ABS on a customised basis and is made freely available to the public (in the 'public access data repository' in the model of the full DRTE set out in Figure 1) the only cost is for the data itself (in the order of several thousand dollars, depending on the level of detail), and an agreement with the ABS must be entered into. On the other hand, if the data is placed in the restricted access repository where access requires a log-in (even if the conditions for access could usually be met by any bona-fide applicant), then there would be a licensing fee in the order of $3,500 per year in addition to the cost of the data (in the order of several thousand dollars), and, again, an agreement will need to be entered into.

5.1.10 National Schools Statistics Collection

The National Schools Statistics Collection (NSSC) is the basis of the annual ABS publication, *Schools, Australia* (Cat. No. 4221.0), which is available as a PDF publication and with additional tables in Excel spreadsheets and as datacubes.

The collection includes high quality data on teacher numbers and FTE, by state and territory, school sector, and, for FTE only, by level of schooling (note that this limitation is a problem for teacher workforce planning and other purposes). Data is also collected on students (by year level, sector, age, sex, whether full-time or part-time, and state/territory) and schools (number, sector, size, state/territory). This data is obtained through an annual census of school authorities and schools (DEEWR collects the data from nongovernment schools and school authorities; the ABS collects directly from government school authorities).

Combined with initial teacher education completions data, indicators such as 'training rates' can be obtained for the states and territories and Australia as a whole. Data on trends in total teacher numbers in each jurisdiction, on student-teacher ratios, and on the proportions of teachers in the respective sectors and levels, are important for workforce planning, and thus for planning initial teacher education numbers.

5.1.11 International movements of teaching professionals

Data from DIAC could be an important component of the DRTE. There are at least three datasets that should be considered: Overseas Arrivals and Departures (OAD) datasets, data from the Longitudinal Survey of Immigrants to Australia (LSIA), and data on visa categories of significance for teaching and teacher education, including those that would be available for

[11] Table Builder is expected to become available during 2009, and promises to be a very useful product. It will give users remote access to a large datacube containing all the output variables included in the Census dictionary. It is designed for experienced users of Census data and will allow for the extraction and manipulation of an unlimited number of Census tables. Confidentialisation occurs during delivery of the specified data. Table Builder will allow users to create tables, graphs and thematic maps of Census data.

<http://www.abs.gov.au/websitedbs/d3310114.nsf/4a256353001af3ed4b2562bb00121564/8b5b19557daa72c1ca2572aa007e4dee!OpenDocument>

overseas students who successfully complete an initial teacher education program in Australia and who wish to become permanent residents (subclasses 880, 881 and 882).

Data on the international movements of teaching professionals is important in understanding the dynamics of the teaching workforce, for understanding the short and long-term destinations of graduates of Australian initial teacher education programs, and for planning effective courses for those with overseas teaching qualifications.

Around 8,000 to 10,000 Australian resident school teachers leave Australia every year, and a large proportion of these would be recent graduates of teacher education programs. Most apparently return to Australia after a few years (Birrell, Rapson & Smith 2006, p. 67). Data on the age of Australian resident school teachers leaving the country and returning would make clearer the association with any recent initial teacher education, as well as assist workforce planning.

Several thousand teachers from overseas settle permanently in Australia each year, and a larger number of long term visitors arrive (Birrell, Rapson & Smith 2006, p. 67). Data on state/territory of intended stay and country of birth or country of residence before coming to Australia would assist planning for in-service teacher education programs targeted to their needs, as well as assist overall workforce planning if departures are also taken into account.

Such information is available in the OAD datasets that are available from DIAC as unit record files. The OAD data is derived from the incoming or outgoing passenger cards completed by Australian residents or overseas visitors as they arrive or depart through Australian airports and seaports. Major variables include:

Nationality/Citizenship
Country of Birth
Age
Sex
Occupation
Type of Movement direction
Length of Intended Stay
Length of Actual Stay/Residence
Reasons for Journey
Country of Residence
Country of Future Residence
Country where Spent or spending Most Time abroad
State of Intended Stay
Country of Disembarkation

A select dataset for 'school teachers'[12] could be obtained from DIAC for a cost in the order of $3000 for the most recent period, with equivalent data for earlier periods available at a discount.

[12] There are sub-classifications of 'pre-primary', 'primary', 'secondary' and 'special education' teachers. However, in each of these classifications there are small numbers – in a recent two year period, in each of these categories there were fewer than 100 'resident departures', yet there were more than 16,000 'resident departures' of 'school teachers not further defined' (Birrell, Rapson & Smith 2006, pp. 62-67).

Overseas students completing initial teacher education courses in Australia numbered over 1,000 in 2007, or 6% of all completions. Data on the visa categories for former overseas students seeking permanent residency (visa subclasses 880, 881 and 882) by field of education (teacher education) would assist estimating the numbers who enter the Australian teaching workforce in an ongoing capacity (note that some former overseas students who enter the Australian teaching workforce do so under different visa categories where their field of education or occupation is not apparent).

Data is also available from DIAC for the Longitudinal Survey of Immigrants to Australia (LSIA)[13]. LSIA is following more than 18,000 immigrants in three cohorts who arrived in Australia since the mid 1990s. A wide range of information is sought, including qualifications, occupation, issues involved in gaining recognition of qualifications, and further education and training received since arriving in Australia. Unit record files are available without cost on a conditional basis (including a signed undertaking that the data will be used only for statistical purposes, confidentiality will be maintained, appropriate acknowledgement made, and so on). The value (taking any costs into account) of select data from LSIA for the DRTE could be investigated through an initial analysis of the dataset.

5.1.12 Teacher education courses

Data on individual courses, and, perhaps, individual units, could be obtained from DEEWR (see section 5.1.2) and/or directly from HEPs (utilising information from handbooks, and/or directly seeking information via a questionnaire). In addition, data collection may be associated with a future system of national accreditation of teacher education courses.

Data could include identifying information (course name and code, institution and campus at which it is provided), length, structure (including exit points) and modes; the timing, nature and duration of practicum; features of curriculum and pedagogy; facilities and resources, and staffing (for secondary teaching, in particular, some of the data may reside with disciplines other than education). An indication of what is possible through a direct survey of faculties of education is provided by the report of the Council of Deans of Nursing and Midwifery data project (CDNM 2007).

Such data would be of value for many purposes, including course selection by potential students (or sponsors of potential students, such as school authorities in regard to post-initial teacher education). Linked with the longitudinal survey of student teachers (section 5.2) and other datasets, this could provide a richly researchable database that may very usefully inform improvements in teacher education.

5.1.13 Academic and other staff involved in teacher education

In addition to DEEWR data on academic staff (section 6.1.3), data derived from surveys of faculties of education/HEPs may provide useful data covering important factors not part of the DEEWR collection, including the nature and recency of experience in relevant educational settings outside HEPs (such as teaching in schools or in non-school early childhood settings).

[13] <http://www.immi.gov.au/media/research/lsia/lsia01.htm>

5.1.14 Historic teacher education statistics

Historic teacher education statistics of useful quality are hard to come by. This is partially explained by the official statistics (published by the ABS, then by the Commonwealth Department of Education) until the 1990s usually not differentiating between pre-service (initial) and in-service (post-initial) graduate diplomas and BEds. Quality data (if limited by jurisdiction) was collected and published by some of the teacher education reviews of the late 1970s and 1980, and in some Commonwealth authority reports in those decades, especially reports of the Tertiary Education Commission (for example, TEC 1981, pp. 111, 124—125 & 129) and the Australian Schools Commission (1981). Good quality data was collected and published by the Discipline Review of Teacher Education in Mathematics and Science (1989). Important data from these and other historic sources could be included in the DRTE.

5.1.15 International statistics

International data on teacher education (and the teaching profession), such as that published by the OECD, could also be included in the DRTE. The OECD has an extensive data repository accessed via the Statistics Portal[14]. The Online Education Database[15] (under the OECD Directorate for Education) includes statistics on personnel, expenditure, foreign student enrolments, graduates by age and field of education, enrolment by type of institution and total population by sex and age. The data can be manipulated using pivot tables. The main publications based on these datasets are the annual publications *Education at a Glance* and *Education Policy Analysis*. All the definitions and conventions used in the underlying data collection, as well as the methodologies used to compile the published statistics and indicators derived from them, are presented in the *OECD Handbook for Internationally Comparative Education Statistics: Concepts, Standards, Definitions and Classifications* (OECD 2004).

The DRTE could include descriptions of and links to the OECD data. It may also be useful to include in the DRTE some of the OECD data directly related to teacher education.

Similarly, some data on the US National Centre for Educational Statistics (NCES)[16] site concerned with teacher education and the teaching profession in the US may be useful to include on the DRTE, and/or for there to be descriptions of and links to the NCES site.

[14] <http://www.oecd.org/statsportal/0,3352,en_2825_293564_1_1_1_1_1,00.html>.

[15] <http://www.oecd.org/document/54/0,3343,en_2649_39263238_38082166_1_1_1_1,00.html>

[16] <http://nces.ed.gov/>

5.2 Longitudinal surveys following cohorts of student teachers

5.2.1 Rationale for a longitudinal study of student teachers

This section discusses a possible ongoing study based on longitudinal surveys of cohorts of student teachers, following them beyond their years at university. It would not be a 'project' limited to a few years.

The data collected would be publicly accessible for diverse research and analysis purposes, as well as having research and analysis carried out as a core component of the study.

The longitudinal study could exist without the DRTE, and the DRTE could exist without the longitudinal study. However, the longitudinal study data would be immensely enriched by being in a well-structured data repository, and linked with or accessible beside other relevant data (such as comprehensive data on student teachers, courses, graduate destinations, teachers and others with teaching qualifications, and their locations and movements). Similarly, the repository would be more effective, useful and cost-efficient with the inclusion of longitudinal study data.

Such a study has been strongly advocated as part of a long term strategy for the improvement of teacher education and for supporting the development of good, evidence-based policy on many aspects of teacher education and beginning teaching. The first recommendation of the February 2007 House of Representatives report on teacher education (House of Representatives 2007) was for such a study:

> The committee recommends that the Australian Government commission a comprehensive longitudinal study into the effectiveness of different models of teacher education across Australia. The longitudinal study should follow cohorts of students from selection into courses, through pre-service preparation, the first five years of service and through their careers (p. 10).

Collections of data from longitudinal studies of student teachers associated with large scale data repositories have been advocated internationally. The panel who prepared *Studying Teacher Education*, the Report of the American Educational Research Association (AERA) Panel on Research and Teacher Education (eds Cochrane-Smith & Zeichner 2005) discussed in great detail (in their 800-page report) the current state of research on teacher education. They concluded that much more was required to build an infrastructure for the quality, depth and breadth of research necessary to adequately inform teacher education policy and practice. Inter alia, they argued for large scale longitudinal studies and 'accurate national databases' (p. 2). They documented the complexities and difficulties in responding to many of the crucial questions in teacher education policy, including how school student learning is affected by different models of initial teacher education (different structures and lengths; different curricula and pedagogies; different recruitment and support programs for student teachers, different areas and levels of professional expertise of teacher educators, and so on) (p.3 and elsewhere). This report could inform the framing of a longitudinal study of Australian student teachers, and inform research activities utilising the data collected through such a study.

Sally Murray and colleagues (Murray et al 2008) reviewed Australian research into teacher education over the decade to 2004. While their report was not as detailed as the AERA investigation, the broad conclusions were similar. They found that teacher education research had grown rapidly, but was still characterised by small scale and fragmented studies, with few that built on existing work – as had been Tisher's finding for earlier decades (1987, 1990).

Both Murray et al and Tisher found that 'review, experimental and longitudinal researches were rare' (Murray et al p. 230). However, Murray et al did find that there were more coherent and substantial bodies of research in four areas: 'mathematics and science preparation, issues related to information and communications technology, reflection and reflective practice, and fieldwork supervision' (p. 227) – though they found very little peer-reviewed research related to early childhood teacher education (p. 236). They concluded that the general lack of systematic, larger scale research was a reflection of the relatively small scale funding that teacher education research has been able to attract, yet there is a 'pressing need for larger-scale, mixed method, evaluative studies of programmes of teacher education' (p. 235), including, inter alia, 'large scale statistical studies examining relationships between programmes of teacher education and student achievement' – such studies 'would require a considerable expansion of the funding base for teacher education research' (p. 235).

Teacher education is vulnerable to public criticism and swings in regulatory requirements that are based on fads and ideology when good, authoritative evidence is scant. There are poor and conflicting understandings of perceived and actual difficulties in attracting sufficient numbers of high ability students into teacher education, and of the relationships between teacher education and teachers' competence, commitment and confidence. Too often solutions are advocated that may well be self-defeating. Such action can be damaging to the future quality of teaching in schools and other settings, to teacher education and to the standing of the teaching profession. It can also be wasteful of human and financial resources, and can undermine public confidence in policy-makers.

This lack of evidence and evidence-based practice is not apparent in some other areas. For example, governments and other policy-makers have been committed to action based on evidence (including the evidence of high level professional judgement) in medicine, for example, and have long had little difficulty funding research into medicine, medical practice, and the medical workforce, including longitudinal studies of medical students and practitioners.

5.2.2 Australian longitudinal studies

There are a large number of longitudinal studies funded by different departments or agencies of the Australian Government.

There are two longitudinal studies that are particularly relevant to this scoping study, providing useful models in some aspects, though they do not focus on student teachers or teachers. The first is the Longitudinal Surveys of Australian Youth (LSAY) and predecessor studies, which have been funded by DEEWR (and its predecessor departments) for more than three decades (see Box 1) and follow cohorts of a commencing sample of around 10,000 randomly selected school students. The second study is the Medical Schools Outcomes Database (MSOD) and Longitudinal Tracking project, which is funded by the Department of Health and Ageing (DoHA), and follows cohorts of all commencing medical students (around 3,000 in 2007) (see Box 2).

Box 1 Longitudinal Surveys of Australian Youth (LSAY)

History LSAY builds on two previous studies – the Youth in Transition (YIT) survey conducted from the mid 1970s to mid 1990s, and the Australian Youth Survey (AYS) conducted by the Commonwealth from 1989 until 1997. LSAY was jointly managed by the Commonwealth and the Australian Council for Educational Research (ACER) from 1995 to 2007, and is currently managed by the Commonwealth and the National Centre for Vocational Education Research (NCVER).

Who is surveyed? Cohorts of around 10,000 commence at age 15 (a random sample of about one in 30 of the total Australian age cohort). The sampled individuals are surveyed by telephone once a year for about ten years. A new cohort is selected (approximately) every three years (1995, 1998, 2003, 2006, and planned for 2009), and since 2003 has been based on the national sample taking the Programme for International Student Assessment (PISA) assessments. It is likely that around 400 initial teacher education graduates could be part of each recent cohort (around one in 40 of the approximately 16,000 domestic initial teacher education graduates).

Focus of surveys 'The LSAY research program provides a rich source of information to help better understand young people and their transitions from school to post-school destinations, as well as exploring social outcomes, such as wellbeing. Information collected as part of the LSAY program covers a wide range of school and post-school topics, including: student achievement, student aspirations, school retention, social background, attitudes to school, work experiences and what students are doing when they leave school.'

Management is by DEEWR, working closely with NCVER and Wallis Consulting (the data collection contractor), and advised by a Strategic Advisory Committee that includes representatives of the states and territories, community organisations and other stakeholders in the program and its outcomes.

Funding Total funding provided by DEEWR of around $1.6m per annum, with about half for design, analytical services and reports, and the remainder for data collection <http://www.dest.gov.au/sectors/training_skills/programmes_funding/programme_categories/key_skills_priorities/lsay.htm#>.

Data collection has been done by the Wallis Consulting Group under contract to the Commonwealth since 2000 <http://www.wallisgroup.com.au/>. *Confidentiality* of individuals is ensured by keeping the names and contact details for every LSAY participant in a secure database at Wallis Consulting Group. These details are stored separately from the data collected during the annual interviews.

Data is deposited with the Australian Social Science Data Archives (ASSDA) <http://assda.anu.edu.au/> at the Australian National University. Permission to use the data and access requirements are managed by ASSDA.

Analytical services and reports are provided by NCVER <http://www.ncver.edu.au/lsay/index.html> collaborating with the Australian National University's Social Policy Evaluation, Analysis and Research Centre (SPEAR) <http://econrsss.anu.edu.au/spear.htm>. ACER formerly provided this service, and technical and analytic reports are on the ACER website <http://www.acer.edu.au/lsay/research.html>.

Box 2 Medical Schools Outcomes Database (MSOD) and Longitudinal Tracking project

Project website <http://www.medicaldeans.org.au/msod.html> .

Overview <http://www.medicaldeans.org.au/pdf/Document%20A_Overview%20MSOD.pdf>

Project management and implementation The study is being carried out by Medical Deans Australia and New Zealand Medical Deans Australia and New Zealand (the peak representative body for the deans of Australian and New Zealand medical schools and faculties), who retain overall responsibility for the conduct of the study and the dataset.

Who is surveyed? The cohorts are composed of all commencing medical students in Australia, the first full survey in 2006, following two pilot years. (New Zealand medical schools will be joining the project.) High levels of support for the project from the Australian Medical Students Association as well as deans of medicine and their staff have resulted in very high response rates and high quality responses. Participants are surveyed on commencement, and will be surveyed on exit and at one, three and five years after medical school. Data is also collected directly from medical schools that track the students (utilising their student number), following their status and educational experiences ('medical schools data').

Purpose and focus Short and long-term monitoring and reporting on outcomes of medical education programs. A significant focus is on matters related to workforce issues such as medical destinations in rural locations – student questionnaires cover whether or not students have a rural background (among many other demographic, educational and career intention matters), and data from medical schools includes information on location of clinical placements and 'rural club' membership.

Data collection and management Data is collected using nationally consistent definitions for key terms and concepts. Data collection, linkage and research is (and will be) according to appropriate ethical approvals. The datasets in the MSOD can (will) only be accessed on the basis of a memorandum of understanding between MSOD research advisory committee and the 'collaborating researcher' <http://www.medicaldeans.org.au/pdf/Document%20D_%20MOU.pdf>. The MOU is based on the Policy and Procedures for Data Access, Analysis and Publication, which covers matters such as ownership and access to data (including data cleaning, processes for approval of requests for access to data), analysis (using appropriate data standards, ensuring subject anonymity), and publication (identification of collaborating researcher, required statement of acknowledgement, approval by MSOD before any publication, and lodgement of any published paper with the MSOD) - <http://www.medicaldeans.org.au/pdf/Document%20B_Pol%20Proc%20Data%20Access.pdf>.

Sub-studies using the participants in the MSOD and linking to MSOD datasets are possible under stringent conditions.

Future linkages It is proposed that the MSOD data be linked with the national medical registration database in an appropriate way after the implementation of national registration in 2010. Other linkages may be possible.

Funding is provided by DoHA.

There are a large number of other very substantial longitudinal studies funded by Australian Government departments and other agencies)[17].

There are a number of longitudinal studies of student teachers that follow them into their post-university careers and other activities. These have varying purposes, scope, methodologies and funding sources. The 'Factors influencing Teacher Choice' (FIT Choice) longitudinal surveys of student teachers study is funded by the Australian Research Council and from other sources. It is a substantial study that has developed, validated and applied an instrument, the FIT-Choice scale, which measures influences on student teachers' choice of career (see Box 3). While participants are limited to a small number of institutions, the findings to date have implications for strategies for recruitment into and retention in teacher education and teaching, for initial and post-initial teacher education program review and development, and for support and deployment of teachers.

Other studies following student teachers tend to be limited in scope, have participants from one institution (or one course), be funded by the universities involved, have various methodologies (some with significant qualitative components), and have purposes related to evaluation of courses and feedback from graduates regarding their teacher education and early career experiences. Such studies can be of great value to those responsible for the courses the study participants were enrolled in, as well as providing useful information for school authorities and others with a stake in the quality of teachers' beginning careers. (There are also studies that are once-off surveys of graduates of initial teacher education and other programs that are not longitudinal, but have similarities with longitudinal studies.)

A national database, based on a representative sample of all Australian student teachers and following them after university, would very significantly strengthen such smaller scale studies, allowing data collected in such studies to be considered in the context of national data,

[17] Other major longitudinal studies that do not focus on student teachers or teachers include:

- the Australian Longitudinal Study on Women's Health, carried out by researchers at the universities of Newcastle and Queensland, funded by the DoHA from 1995, and planned to continue to at least 2016 <http://www.alswh.org.au/project.htm>
- the Household, Income and Labour Dynamics in Australia (HILDA) survey funded by the Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) at over $5m per annum to 2011<http://www.fahcsia.gov.au/internet/facsinternet.nsf/research/ldi-hilda.htm>
- the Longitudinal Survey of Immigrants to Australia (LSIA), funded and managed by DIAC <http://www.immi.gov.au/media/research/lsia/lsia01.htm>
- Growing Up in Australia, the Longitudinal Study of Australian Children initiated and funded by FaHCSIA. The study was launched in 2004, and involves a nationally representative sample of children, and examines issues of policy relevance, including a range of research questions about family functioning, health, non-parental child-care, and education <http://www.aifs.gov.au/growingup/home.html>.
- the Australian Research Council-funded longitudinal studies following student nurses and midwives ('Nurses and Midwives e-cohort' < http://nurses.e-cohort.net/>) and medical students ('Doctors e-cohort' study <http://doctors.e-cohort.net/>) into their careers.

including data on students enrolled in other courses or institutions, or who have attributes that are comparable in important ways.

Data from such other longitudinal and other studies could also be included in the DRTE with the agreement of those responsible for them. In general the data would need to be consistent with relevant standards and of an appropriate quality (see section 5.3.2).

Box 3 'Factors influencing Teacher Choice' (FIT Choice) longitudinal surveys of student teachers

Project website <www.fitchoice.org

Who is surveyed To date there are more than 2000 participants from Australia, the US, the UK, Germany and Norway, who enrolled in undergraduate and graduate-entry teacher education courses (covering secondary, primary, early childhood, and other specialisms) at participating universities. Those who do not complete their teaching qualification and those completed but are not teaching professionals are maintained in the surveyed cohorts.

Focus of surveys A 'large-scale longitudinal program of research which investigates motivations for selecting teaching as a career, teaching self-efficacy, and experiences of beginning teachers. . . It addresses problems of recruitment and retention in the current climate of teacher shortages. It establishes profiles of motivations for career choice at teaching degree entry, traces changes in perceived competencies and professional commitment from degree exit through to early professional experiences, and identifies factors and contextual processes conducive to or inhibitory of retention.'

Project management and implementation are carried out by Monash University academics, Dr Helen Watt and Dr Paul Richardson, working with colleagues at universities in Australia and overseas.

Funding is provided by the Australian Research Council (Discovery Large Grant) and several participating universities.

5.2.3 Proposal for a longitudinal study of student teachers

The proposal for an ongoing study involving longitudinal surveys of cohorts of student teachers will be outlined under the following headings: Purposes; management; design; survey administration; data storage and maintenance; analytical services and reports; and funding quantum and sources. Features of some existing longitudinal studies will be referred to. There is not doubt that LSAY and MSOD (as well as other studies such as HILDA and the Australian Longitudinal Study on Women's Health) make it clear that a really valuable longitudinal study requires substantial resources and care to successfully implement and maintain.

Purposes

The nature of the study as a whole and particular survey items would be determined in large part by the purposes for which the data collected could be used. The data could be used for many different and unanticipated purposes, particularly if it is linked to (or simply used with) data collected separately about student teachers, teachers or courses. However, there should be a clear central purpose, or set of purposes for the longitudinal study itself.

The data may be the major data used in a particular investigation or report, or it may support, or complement, or provide a context for other data used in an investigation or report.

A primary and ongoing purpose of the data collected through longitudinal surveys of student teachers would be to investigate the effectiveness of different models of teacher education or particular initiatives or features in teacher education. The findings could then be used to

- inform teacher education course (or unit or initiative) modification, development and general improvement
- inform the drafting of criteria for accreditation of teacher education by an external, national accreditation body
- inform potential student course choices
- inform decisions by governments and others about particular types of programs or initiatives that should be sponsored - whether those initiatives seek qualitative improvements in teaching, or the recruitment to or retention in particular locations (such as rural and remote or other hard-to-staff locations), levels or types of settings (such as fully qualified early childhood teachers in long day early childhood education settings), or in particular specialisations (such as mathematics or physics)
- generally provide information about and accountability for teacher education.

The data obtained in the study must be adequate for findings to be used validly for such purposes. Thus sufficiently detailed quality data needs to be obtained on

- study participants' attributes that are not an outcome of their initial teacher education program – demographic characteristics; socioeconomic status, cultural and geographic background; academic and other achievements at course commencement (such as, but not limited to, tertiary entrance scores or equivalent); motivational and other psychological attributes, and so on
- the course itself – in general terms (perhaps provided by a link to a separate dataset on courses, or utilising data provided by HEPs paralleling that provided by medical schools on medical courses as part of the MSOD study – see Box 2), and in sufficient detail about units and activities to track individual's relevant experiences (transfers between courses and HEPs may also need to be tracked)
- measures of participants' success in key components of the course, as well as the course as a whole
- the experiences of the participants after completing (or leaving) the course, and the context of those experiences (including whether or not they entered and were retained in the teaching workforce)
- participants' reflections and views on their courses, subsequent experiences, their intentions, expectations and aspirations.

There are a number of criteria according to which a course (or initiative) could be evaluated. Like the MSOD, initiatives intended to increase the availability of graduates to work in rural and remote areas could be evaluated. Such initiatives may be course components such as units with content related specifically to rural education, practicum and other experiences in rural and remote locations, or schemes to increase the number of student teachers from rural and remote backgrounds. Similarly, there may be schemes to attract experienced professionals from other fields into teaching, providing them with particular incentives and support and tailored curriculum. Here key questions may be whether such initiatives (relative to other

initiatives or standard programs) attract and retain the targeted groups, and whether they go on to have successful teaching careers, meeting the intended educational needs.

Effective student learning in schools or other educational settings is the ultimate, central purpose of teacher education programs. However, such effective student learning may not be, in any simple sense, appropriate direct criteria for course evaluation based on data such as that available from a longitudinal study of student teachers[18].

Management

The initiative would need management by an appropriately structured board or committee that has expertise, independence and transparency. This would ensure both that the study was well carried out, and that potential users and others with an interest have a link to the initiative. The primary management could rest with the governing board of the DRTE, or, for the longitudinal study as a distinct entity, an appropriate constituted managing committee. Depending on the nature of the funding, the funding body/ies may also play a significant role in management.

Design

The broad features of the study design should be considered at this stage, the detail to be determined by the study managers. In particular

1. *Sample selection and cohort size* Selection of participants in the survey would need to assure representativeness and thus a random (or stratified random) selection process would be appropriate, with strategies to ensure very high response rates from those selected (or their replacement by matching individuals). There were around 26,000 initial teacher education commencements in 2007 (which may increase to around 35,000 over coming years[19]). This is more than three times the LSAY cohort size, and

[18] The panel who prepared *Studying Teacher Education*, the Report of the American Educational Research Association Panel on Research and Teacher Education (eds Cochrane-Smith & Zeichner 2005) acknowledged

> the difficulty in producing research that examines the impact of teacher preparation on the eventual achievement of pupils in K-12 classrooms. This kind of research depends on a chain of causal evidence with several critical links: empirical evidence demonstrating the link between teacher preparation programs or structures and teacher candidates learning (i.e. candidates' knowledge growth, skills and dispositions); empirical evidence demonstrating the link between candidates' learning and their practices in actual classrooms; and empirical evidence demonstrating the link between the practices of graduates of teacher preparation programs and what their pupils learn. Individually each one of these links is complex and challenging to estimate. When they are combined, the challenges are multiplied: There are often substantial time lags between the teacher preparation periods and the eventual measures of pupils' achievement; there are many confounding and intervening variables (which are themselves difficult to measure) that influence what teacher candidates are able to do and what their pupils learn; and the sites where teacher candidates complete fieldwork and eventually teach are quite different from one another in terms of context, school culture, resources available, students and communities. Unravelling the complicated relationships between and among these variables and the contexts and conditions in which they occur is exceedingly complex, and of course this entire enterprise assumes in the first place that there is consensus about appropriate and valid outcome measures, an assumption that is arguable (p. 3).

[19] This is based on evidence from 2006 ABS Census data (custom tables) of more than 10,000 school teachers in each year of the age range 48 to 53. Their coming retirements should be added to annual net separation rates of younger teachers of around 2% to 3%, a transition rate from initial teacher education completion into the teaching workforce of around 75%, and a retention rate from initial teacher education commencement to

ten times the MSOD (all commencing medical students) cohort size. A sample of around 4,000 would represent around one in seven teacher education commencers. Because of the great diversity among teacher education courses and units, and among student teachers, a smaller sample may result in lower quality data. In addition, a smaller sample may involve more significant issues of confidentiality if units and courses with relatively small enrolments are identifiable and if relatively unusual individual personal characteristics and experiences are identifiable and linked to the units/courses. In addition, the original sample size must take account of the challenges of retaining an adequate proportion over successive years. With considerable effort and cost, LSAY generally achieves retention of around 90% from one survey year to the next. At this rate, the original sample would halve in around seven years.

2. *Nature of surveys* The first survey of each cohort should probably be an initial written questionnaire completed around initial teacher education course commencement. This is consistent with the practice of LSAY, MSOD and other longitudinal studies. MSOD involves surveys completed by students in class time and under the auspices of the medical school. This helps ensure a very high participation rate and high quality data because queries from participants can be dealt with at the time. Ethics clearance is obtained as it is part of official medical school activity. Information about the study and its importance, and feedback to participants helps ensure their commitment to the study. Engendering enthusiasm will be an important aspect of the initial stage of participant's involvement. If the initial survey is carried out in class time when all students are in attendance, it may be cost-effective to survey all students (as occurs with MSOD), and select the sample for subsequent surveys. Those subsequent surveys should probably be telephone interviews or online survey completion – using whatever technique best assures a high rate of participation by the selected sample, high quality responses, and ongoing commitment to the study by participants. LSAY makes postal as well as phone contact with participants to ensure that contact details are up-to-date. Participants should be kept informed about progress on the data analysis, and research and policy reports as they become available on the DRTE.
3. *Content of surveys* Detail of items would be determined by the purposes, as noted above. The items used in the surveys should, as far as possible, be according to recognised standards (see Appendix B) and/or common with significant, authoritative studies, such as LSAY and Staff in Australia's Schools (SiAS) or its successor studies. Having items common between the longitudinal study of student teachers and other significant studies would help ensure data quality (and efficiency of instrument development), and, very importantly allow substantial analyses using data from the respective studies, so that the student teachers (or, in later surveys, former student teachers) can be compared with current teachers in all stages of their careers (the SiAS data), young people representative of the total population in their age cohort (LSAY), and participants in other relevant studies.

completion of around 78%. This assumes no significant increase in net overseas arrivals of teaching professionals.

4. *Frequency of surveys of each cohort* If annual from the time of commencement, rich information may be possible on issues related to course progression and satisfaction, as well as accurate and detailed information about the actual nature of the initial teacher education program undertaken, and about post-graduation experiences. In line with the HoR recommendation (above), an annual (or biennial) survey for about eight years (based on an average initial teacher education course length of about three years, then five years post completion), then subsequent interviews every four to six years may be most cost-effective.
5. *Frequency of cohort 'waves'* A new cohort approximately every four years may be cost-effective – sufficient to pick up significant changes in teacher education, in student cohorts and in patterns of post-course experiences.

Administration of the surveys

The full sequence of surveys, or those after an initial paper-based survey, may be best contracted to an experienced company with established protocols and systems, ensuring consistent expertise, continuity and appropriate confidentiality (as with LSAY and HILDA).

Data storage, maintenance and access

The data would be stored in the DRTE so that it can be linked with other data, especially data on courses, as well as data on enrolments collected by DEEWR and from faculties of education. The data could also be deposited in ASSDA so that it can be accessed alongside LSAY and other data – or a link to the ASSDA and the LSAY data provided on the DRTE site.

While directly identifying information will not be associated with the data in the DRTE (or other depository), there may still be confidentiality issues, especially associated with units and courses with smaller enrolments. Therefore access to the full dataset would still need to be restricted.

Analytical services and reports

High quality analysis and reporting must be assured if the substantial resources put into data collection (including the time of current and former student teacher respondents) are not to risk being wasted. While the data may be used by a range of researchers and policy-makers, analysis and reporting directed to the primary purposes of the data collection should be part of the overall project (as it is for the other major longitudinal studies referred to in this section). Some of that work could be commissioned from external research organisations, as well as prepared by researchers associated with the DRTE.

Funding quantum and sources

Carrying out high quality surveys of large numbers of individuals requires substantial funds. This is in contrast to most other datasets being considered for the DRTE where the initial collection of the data is for other purposes or is not an expensive exercise. Similarly, adequate analysis and reporting require substantial funds.

The longitudinal surveys initiative is being considered as ongoing, not a project of limited life. Therefore, the funding source would need to be able to provide such ongoing funding.

The LSAY costings provide an indication of quantum. A minimum of around half the annual $1.6 million LSAY budget (around $800,000 per annum) may be appropriate – assuming sample sizes and frequency of surveying discussed above.

Funding of the longitudinal study as an integral part of the DRTE would be optimal, though components of the study could be contracted out (data collection certainly should be contracted out to an appropriate organisation). Oversight of the study might require an external steering committee or council with appropriate expertise and experience. Quality, impartiality/independence, authoritativeness and long term continuity must be assured, whatever the funding sources and mechanisms and management structures. While large scale, but short term, funding, such as from the ARC or government agencies with a particular policy concern at a particular time, may be possible and result in valuable analysis and reports, it should not be relied on for the core study.

5.3 Optional datasets and datasets for future consideration

Optional datasets and datasets for future consideration include a wide range of possible data collections - such as data that might be collected in the future by teacher regulatory authorities, data arising from research carried out for other purposes, and many other possible sources.

5.3.1 Teacher regulatory authority data collections

Teacher regulatory authorities have been or are being established around the country. This provides potential for the collection of high quality, national data on registered teachers (generally only school teachers at this time). This section discusses some future possibilities, but notes the constraints on such possibilities for some time yet.

If data could be collected with classifications comparable with the longitudinal survey particularly rich analysis may be possible. The MSOD is planning to link data collected from the individual participants in the study (the full cohort of commencing medical students) and medical schools (utilising individuals' student numbers) with data collected through the national medical registration system to be established in 2010. Linking of individuals in the respective data collections for former student teachers may be technically possible through identifiers held by the longitudinal data collection contractor and the teacher regulatory authority. However, privacy concerns would need to be overcome in each jurisdiction, which may be difficult, even with the MSOD precedent. Even if such individual linking is not possible, comparative analysis of un-linked data may still be of great value.

In the future, teacher regulatory authorities may wish to collaborate with the DRTE in surveys similar to those carried out annually for the AIHW by the nursing and midwifery regulatory authorities (or state/territory departments of health), and published by the AIHW. The most recent report, *Nursing and midwifery labour force 2005*(AIHW 2008)

> provides information on the nursing and midwifery labour force, based primarily on estimates derived from the 2005 Australian Institute of Health and Welfare (AIHW) Nursing and Midwifery Labour Force Census. This census collects information on the demographic and employment characteristics of nurses and midwives who were registered or enrolled in Australia at the time of the survey. It is conducted annually by state and territory health departments, with the questionnaire administered in most jurisdictions by the nursing and midwifery registration boards, in conjunction with the registration renewal process (p. viii).

All re-registering nurses and midwives are surveyed (it is a census), but participation is voluntary, and the response rate for the 2005 survey was 55%, compared with 77% for the 2001 survey. The AIHW has been criticised for the delay between data collection and publication (two to three years), and some problems related to response rates, administration in some jurisdictions, and other data quality matters. However, the rich and generally good quality data provides detail on demographic characteristics, specialist qualifications, hours and place of work, clinical area and work setting. The reports published by AIHW also include data from DEEWR on enrolments and completions, and migration data from DIAC. There are parallels between this annual data collection covering registered and enrolled nurses and the SiAS survey outlined in Appendix F (McKenzie et al 2008).

These are all possibilities that may be some time off because the regulatory authorities have statutory requirements to collect particular datasets and to maintain particular levels of

privacy and control over data. There are also some incompatibilities and limitations in technical capabilities and data definitions and collection protocols. However, over time, and with productive collaboration between the regulating authorities and the DRTE, collections for national datasets could be developed.

5.3.2 Data from other collections and research projects

There are many research projects that have collected, or will in the future collect, data that might be relevant to the DRTE. Such data could be included as selected data or full datasets, or text introductions provided for the data with links or references to reports (or datasets) elsewhere.

Possible data for consideration includes that from the 2006-2007 SiAS (McKenzie 2008 et al) survey, and any future similar surveys; data collected as part of investigations into research outputs of education faculties being carried out in the context of the development of the Excellence in Research in Australia (ERA) structures; or any of a diverse range of collections and projects in Australia and overseas.

The practice of depositing data from relevant research and administrative collections could be encouraged and facilitated through publicity and assistance by DRTE staff. The experiences of the ASSDA may be valuable for the DRTE. It could also be a condition of funding from some agencies that relevant data collected is deposited in the DRTE. How and where such conditionality would occur could be investigated by DRTE staff, who would then collaborate with appropriate agencies on implementation.

It would be a responsibility of DRTE staff to seek out potentially valuable new sources of data for the repository.

Part 4

Conclusions & recommendations

6 Conclusions and recommendations

This scoping study has involved research into all aspects of the proposed data repository for teacher education. Extensive consultations have been carried out, and advice sought from stakeholders in teacher education, other potential users of the repository, potential data providers, and relevant experts.

The task of the study was to investigate the need and support for, and feasibility and specifications of a national data repository with systematically managed, accessible and usable data concerned with teacher education and related areas

Some matters cannot be firmly recommended because of the limitations of time and resources of this study or because of the current uncertainty about some external developments.

However, the study found a clear need for the repository and strong support for it. Key organisations are committed to promoting and supporting its wide use once it is established.

The DRTE clearly appears to be feasible in the broad terms set out in this report when account is taken of:

- need, support and indications of utilisation
- existing levels of government funding for a diverse range of initiatives and entities in other fields
- administrative possibilities
- technical and professional capabilities.

Broad technical and structural specifications for the DRTE have been set out, and possible data content considered in some detail.

It has been estimated that an effective and efficient DRTE would need annual funding of around $1.5 million to $2.0 million.

It is therefore recommended that the proposal for a DRTE be further advanced through cooperation between the ACDE and DEEWR to ensure:

> **Recommendation 1: Budget process** That the DRTE is placed on the agenda for consideration in the process leading up to the 2009 Commonwealth budget.
>
> **Recommendation 2: Development of specifications** That specifications for the DRTE be further developed as required for Budget decisions. This may include location/hosting of the repository, technical specifications, timelines for development of the repository, including data collection, and determination of responsibilities for preparatory and transitional tasks. Once established, the work of the DRTE should include periodic review regarding the extent to which it is meeting objectives, and consultations with users and data providers regarding their evaluation of the DRTE.

As Budget deliberations occur it may be necessary to consider and seek alternative or supplementary sources of funds. Planning for actual implementation will be necessary once funding is assured.

Appendixes

Appendix A DRTE as infrastructure

The DRTE should be viewed as potential *infrastructure*, an element of Australian (and international) e-infrastructure, or 'cyberinfrastructure', to use the US term – see for example, *Our Cultural Commonwealth: The report of the American Council of Learned Societies Commission on Cyberinfrastructure for the Humanities and Social Sciences* (American Council of Learned Societies 2006).

In his paper, 'The new Holy Grail: an Australian e-infrastructure', T. Alex Reid (2007) discusses the features of infrastructure in general and e-infrastructure in particular.

Resources or facilities that can be considered infrastructure:

- are shared in some way – they are generally a 'public good'
- are ongoing, not ad hoc, and are usually developed and modified incrementally and smoothly
- have a degree of invisibility – they are taken for granted, and are assumed to be there for use as required and can be relied on
- comply with relevant standards; they are not idiosyncratic
- are accessible and relatively simple to use
- are available free or at low cost so that any cost of use is not a significant impediment to use
- appear seamless – elements are integrated (p. 2).

Infrastructure *enables* significant activities such as communication, travel and transport. The value of infrastructure lies in its enabling capability. Similarly, the value of e-infrastructure (or cyberinfrastructure) lies in the research, communication, management and so on that it enables.

Drawing from the work of NCRIS, Reid notes the following additional elements and features of e-infrastructure:

- 'data storage management, access, discovery and curation'
- high performance computing (software and hardware)
- support services to assist researchers (and other users) in effectively making full use of the infrastructure (p. 10).

He comments that 'one area that does seem to be missing from the NCRIS remit is that of developing, building or collecting content' (though content has been part of other e-infrastructure-related initiatives) (p. 10). The collection and structuring of content is a significant component of the DRTE being considered in this scoping study.

Fitzgerald and Pappalardo (2007) emphasise the importance of understanding both data management and the legal framework as part of e-infrastructure.

Regarding data management, they note that new collaborative research platforms have been made possible by advances in information and communications technologies, but that they:

> require active and professional management of the processes by which data is generated, organised, evaluated and disseminated. The importance of professional management of

> research data and information has consistently been identified as central to data and information infrastructures (p. 8).

Regarding the legal framework they note that:

> It has become increasingly apparent that to achieve seamless access to data it is necessary not only to adopt appropriate technical standards, practices and architecture, but also to develop legal frameworks that facilitate access to and use of research data, whether on an inter-organisational basis or across national borders. The benefits that may potentially be gained through advances in information and communications technologies will not be achieved solely by engineering but will result from a combination of social, legal and technical factors (p. 9).

Appendix B Data standards and standard classifications

Wherever possible, data should be collected and organised according to standards that are officially recognised (or commonly used) and appropriate for the task. This appendix, first, introduces significant Australian sites and an OECD document that provide guidance, information and links regarding data principles and standards, metadata and related matters, and, second, describes appropriate standard classifications and commonly accepted measures and definitions covering the major topics likely to be included in the DRTE. The standard classification documents are included in the References of this report where there are the links to the full documents on the ABS (or other) websites. Those documents provide the full classification structures as well as detailed explanations of the history, nature and purposes of the classifications, which are only very briefly covered in this appendix.

B.1 Sources on data principles and standards

The **National Statistical Service (NSS)** <http://www.nss.gov.au/nss/home.NSF/> has been established by the ABS, and involves a coalition of agencies to deliver statistical information for policy, research and decision making. The NSS Key Principles (including as an attachment the United Nations *Fundamental Principles of Official Statistics*) are set out in full in Appendix C.

The **Australian Institute of Health and Welfare's Metadata Online Registry (METeOR) <**http://meteor.aihw.gov.au/> is the repository for national data standards for the health, community services and housing assistance sectors, and provides clear introductions to 'data standards' and 'metadata'. METeOR follows the ISO/IEC Metadata Registry (MDR) standard, ISO/IEC 11179.

The National Centre for Vocational Education and Research (NCVER) develops and maintains statistical standards related to vocational education and training. These are documented in **Australian Vocational Education and Training Management Information Statistical Standard (AVETMISS)** <http://www.ncver.edu.au/avetmiss/index.html>.

The **Organisation for Economic Cooperation and Development's** *OECD Handbook for Internationally Comparative Education Statistics: Concepts, Standards, Definitions and Classifications* (OECD 2004) documents standards and classifications used by the OECD and which, in many cases, have a connection with Australian standards and classifications. The 274-page document is available as a PDF from the OECD website, or for purchase as a hard copy. According to the OECD:

> This handbook provides answers to questions such as "What is a teacher?", "What do we mean by public education expenditure?" as well as questions concerning the use of the indicators "How should I interpret expenditure per student?" "What is it measuring?". In so doing, the handbook aims to facilitate a greater understanding of the OECD statistics and indicators produced and so allow for their more effective use in policy analysis. Equally, it provides a ready reference of international standards and conventions for others to follow in the collection and assimilation of educational data. This publication describes the

methodology used in the International Survey of Upper Secondary Schools (ISUSS) and in related OECD publications and allows researchers to understand and replicate its analyses.

B.2 Education – field and level

The **Australian Standard Classification of Education (ASCED)** (ABS 2001) classifies education by 'field of education' (FoE) and 'level of education'. The document provides detailed definitions and correspondence tables with higher education discipline groups and other classification structures.

There are twelve broad fields of education. The broad field, 'Education' (07), has the following narrow and detailed fields:

0701 TEACHER EDUCATION
- 070101 Teacher Education: Early Childhood
- 070103 Teacher Education: Primary
- 070105 Teacher Education: Secondary
- 070107 Teacher-Librarianship
- 070109 Teacher Education: Vocational Education and Training
- 070111 Teacher Education: Higher Education
- 070113 Teacher Education: Special Education
- 070115 English as a Second Language Teaching
- 070117 Nursing Education Teacher Training
- 070199 Teacher Education, n.e.c.

0703 CURRICULUM AND EDUCATION STUDIES
- 070301 Curriculum Studies
- 070303 Education Studies

0799 OTHER EDUCATION
- 079999 Education, n.e.c.

The full 'level of education' classification at the broad, narrow and detailed levels is as follows (the ABS Census and DEEWR higher education collections cover only the post school categories):

1 POSTGRADUATE DEGREE LEVEL
- 11 DOCTORAL DEGREE LEVEL
  - 111 Higher Doctorate
  - 112 Doctorate by Research
  - 113 Doctorate by Coursework
  - 114 Professional Specialist Qualification at Doctoral Degree Level
  - 115 Statement of Attainment at Doctoral Degree Level
  - 116 Bridging and Enabling Course at Doctoral Degree Level
- 12 MASTER DEGREE LEVEL
  - 121 Master Degree by Research
  - 122 Master Degree by Coursework
  - 123 Professional Specialist Qualification at Master Degree Level
  - 124 Statement of Attainment at Master Degree Level
  - 125 Bridging and Enabling Course at Master Degree Level

2 GRADUATE DIPLOMA AND GRADUATE CERTIFICATE LEVEL

21 GRADUATE DIPLOMA LEVEL

211 Graduate Diploma

212 Graduate Qualifying or Preliminary

213 Professional Specialist Qualification at Graduate Diploma Level

214 Statement of Attainment at Graduate Diploma Level

215 Bridging and Enabling Course at Graduate Diploma Level

22 GRADUATE CERTIFICATE LEVEL

221 Graduate Certificate

222 Professional Specialist Qualification at Graduate Certificate Level

223 Statement of Attainment at Graduate Certificate Level

224 Bridging and Enabling Course at Graduate Certificate Level

3 BACHELOR DEGREE LEVEL

31 BACHELOR DEGREE LEVEL

311 Bachelor (Honours) Degree

312 Bachelor (Pass) Degree

313 Statement of Attainment at Bachelor Degree Level

314 Bridging and Enabling Course at Bachelor Degree Level

4 ADVANCED DIPLOMA AND DIPLOMA LEVEL

41 ADVANCED DIPLOMA AND ASSOCIATE DEGREE LEVEL

411 Advanced Diploma

412 Statement of Attainment at Advanced Diploma Level

413 Associate Degree

414 Statement of Attainment at Associate Degree Level

415 Bridging and Enabling Course at Advanced Diploma and Associate Degree Level

42 DIPLOMA LEVEL

421 Diploma

422 Statement of Attainment at Diploma Level

423 Bridging and Enabling Course at Diploma Level

5 CERTIFICATE LEVEL

51 CERTIFICATE III & IV LEVEL

511 Certificate IV

512 Statement of Attainment at Certificate IV Level

513 Bridging and Enabling Course at Certificate IV Level

514 Certificate III

515 Statement of Attainment at Certificate III Level

516 Bridging and Enabling Course at Certificate III Level

52 CERTIFICATE I & II LEVEL

521 Certificate II

522 Statement of Attainment at Certificate II Level

523 Bridging and Enabling Course at Certificate II Level

524 Certificate I

525 Statement of Attainment at Certificate I Level

6 SECONDARY EDUCATION

61 SENIOR SECONDARY EDUCATION
611 Year 12
612 Bridging and Enabling Course at Senior Secondary Level
613 Year 11
62 JUNIOR SECONDARY EDUCATION
621 Year 10
622 Year 9
623 Year 8
624 Year 7 (NSW, Vic., Tas., ACT)
7 PRIMARY EDUCATION
71 PRIMARY EDUCATION
711 Year 7 (QLD, SA, WA, NT)
712 Year 6
713 Year 5
714 Year 4
715 Year 3
716 Year 2
717 Year 1
718 Pre-Year 1
8 PRE-PRIMARY EDUCATION
81 PRE-PRIMARY EDUCATION
811 Pre-primary Education
9 OTHER EDUCATION
91 NON-AWARD COURSES
911 Non-award Courses in Higher Education
912 Other Non-award Courses
99 MISCELLANEOUS EDUCATION
991 Statements of Attainment not Identifiable by Level
992 Bridging and Enabling Courses not Identifiable by Level
999 Education, n.e.c.

B.3 Schools, teachers and students

The National Schools Statistics Collection (NSSC) is the basis of the ABS publication, *Schools, Australia* (Cat. No. 4221.0). The NSSC is an annual census conducted collaboratively by school authorities, DEEWR and the ABS. The ABS collects data according to agreed standards and definitions on schools, teachers and students in the government sector directly from state and territory school authorities, and DEEWR collects equivalent data for nongovernment sectors from the schools and systems in those sectors. (Data is also collected on financial matters as part of the NSSC, but this is not published in *Schools, Australia*.) Data is available down to the state/territory geographic level. Explanatory notes and a glossary are included in each edition of *Schools, Australia.*

For information about the NSSC see
<http://www.abs.gov.au/AUSSTATS/abs@.nsf/DSSbyCollectionid/6F7111FCBD0121C0CA256BD00027255B?opendocument>.

B.4 Occupation

The **Australian and New Zealand Standard Classification of Occupations (ANZSCO)** (ABS & Statistics New Zealand 2006) is the classification used for the ABS Census (to the four digit level only), and for most Australian and New Zealand datasets that include information on occupations (including social surveys carried out for a range of research and other purposes). The six digit 'unit' group classification includes a number of categories unique to New Zealand.

The occupations are classified according to skill levels 1 to 5. Education professionals, along with other professionals, are at skill level 1.

The categories for 'sub-major', 'minor' and 'unit' groups in the 'major' group of 'Education Professionals' (24) are as follows:

241 School Teachers

2411 Early Childhood (Pre-primary School) Teachers

241111 Early Childhood (Pre-primary School) Teacher

241112 Kaiako Kohanga Reo (Maori Language Nest Teacher)

2412 Primary School Teachers

241211 Kaiako Kura Kaupapa Maori (Maori-medium Primary School Teacher)

241212 Pouako Kura Kaupapa Maori (Maori-medium Primary School Senior Teacher)

241213 Primary School Teacher

2413 Middle School Teachers (Aus) / Intermediate School Teachers (NZ)

241311 Middle School Teacher (Aus) / Intermediate School Teacher (NZ)

2414 Secondary School Teachers

241411 Secondary School Teacher

2415 Special Education Teachers

241511 Special Needs Teacher

241512 Teacher of the Hearing Impaired

241513 Teacher of the Sight Impaired

241599 Special Education Teachers nec

242 Tertiary Education Teachers

2421 University Lecturers and Tutors

242111 University Lecturer

242112 University Tutor

2422 Vocational Education Teachers (Aus) / Polytechnic Teachers (NZ)

242211 Vocational Education Teacher (Aus) / Polytechnic Teacher (NZ)

249 Miscellaneous Education Professionals

2491 Education Advisers and Reviewers

249111 Education Adviser

249112 Education Reviewer

2492 Private Tutors and Teachers

249211 Art Teacher (Private Tuition)

249212 Dance Teacher (Private Tuition)

249213 Drama Teacher (Private Tuition)

249214 Music Teacher (Private Tuition)
249299 Private Tutors and Teachers nec
2493 Teachers of English to Speakers of Other Languages
249311 Teacher of English to Speakers of Other Languages

B.5 Research and Experimental Development

Data on research and experimental development (R&D) expenditure is collected from HEPs by DEEWR for the ABS and from other sectors directly by the ABS, according to:

- type of activity (TOA) (for categories see below)
- field of research (FOR) (for categories see below) (this was formerly research fields, courses and disciplines - RFCD).
- socio-economic objective (SEO) (for categories see below)
- source of the funds (Australian competitive research grants, which may be Commonwealth schemes or non-Commonwealth schemes; other Australian sources which may be state, territory or local government, other Commonwealth government, business enterprises, general university funds (GUF); or other; or overseas)
- type of expenditure (land and buildings, other capital expenditure; direct labour costs; scholarships, or other current expenditure).

The ABS publishes R&D data according to the person years of human resources devoted to it as well as expenditure.

The ABS notes that R&D is defined in accordance with the OECD standard as comprising 'creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications'. The OECD *Frascati Manual* (Proposed Standard Practice for Surveys on Research and Experimental Development) (OECD 2002) provides a detailed discussion of the matters to be classified and the classification structures.

The Australian and New Zealand Standard Research Classification (ANZSRC) (ABS 2008) replaces the **Australian Standard Research Classification** (ASRC) (ABS 1998). The ANZSRC covers areas specific to New Zealand (such as Maori education) as well as areas relevant to both Australia and New Zealand. Both the ANZSRC and ASRC are consistent with the standards of the *Frascati Manual*, and cover three of the relevant classifications:

- type of activity (TOA)
- field of research (FOR) (in the ASRC, research fields, courses and disciplines - RFCD).
- socio-economic objective (SEO).

The TOA categorises according to the type of research effort:

- pure basic research
- strategic basic research
- applied research and experimental development.

The FOR categorises according to the methodology used in the R&D. The categories in the classification include major fields of research investigated by national research institutions and organisations, and emerging areas of study.

Education is in Division 13, which has four groups:

1301 Education Systems

1302 Curriculum and Pedagogy

1303 Specialist Studies in Education

1399 Other Education.

There are significant exclusions that were not specified in the earlier *Australian Standard Research Classification* (ASRC) (ABS 1998). These exclusions are

a) Economics of education are included in Group 1402 Applied Economics.

b) Education policy is included in Group 1605 Policy and Administration.

c) Sociology of education is included in Group 1608 Sociology.

d) Educational psychology is included in Group 1701 Psychology.

e) Educational linguistics is included in Group 2004 Linguistics.

f) History and philosophy of education is included in Group 2202 History and Philosophy of Specific Fields.

These exclusions are important and controversial for those involved in educational research (see, for example, Gough 2008).

The four FOR groups in Education and their fields are as follows:

GROUP 1301 EDUCATION SYSTEMS. This group covers systems for the delivery of education services and has nine fields:

130101 Continuing and Community Education

130102 Early Childhood Education (excl. Maori)

130103 Higher Education

130104 Kura Kaupapa Maori (Maori Primary Education)

130105 Primary Education (excl. Maori)

130106 Secondary Education

130107 Te Whariki (Maori Early Childhood Education)

130108 Technical, Further and Workplace Education

130199 Education systems not elsewhere classified.

GROUP 1302 CURRICULUM AND PEDAGOGY. This group covers curriculum and pedagogy, including its theory and development, and has fourteen fields:

130201 Creative Arts, Media and Communication Curriculum and Pedagogy

130202 Curriculum and Pedagogy Theory and Development

130203 Economics, Business and Management Curriculum and Pedagogy

130204 English and Literacy Curriculum and Pedagogy (excl. LOTE, ESL and TESOL)

130205 Humanities and Social Sciences Curriculum and Pedagogy (excl. Economics, Business and Management)

130206 Kohanga Reo (Maori Language Curriculum and Pedagogy)

130207 LOTE, ESL and TESOL Curriculum and Pedagogy (excl. Maori)

130208 Mathematics and Numeracy Curriculum and Pedagogy

130209 Medicine, Nursing and Health Curriculum and Pedagogy

130210 Physical Education and Development Curriculum and Pedagogy

130211 Religion Curriculum and Pedagogy

130212 Science, Technology and Engineering Curriculum and Pedagogy

130213 Vocational Education and Training Curriculum and Pedagogy

130299 Curriculum and Pedagogy not elsewhere classified.

GROUP 1303 SPECIALIST STUDIES IN EDUCATION. This group covers specialist studies in education, and includes: educational issues related to specific ethnic groups; education assessment and evaluation; educational technology; learning sciences; special education; and teacher education and professional development of educators. This group has fourteen fields:

130301 Aboriginal and Torres Strait Islander Education

130302 Comparative and Cross-Cultural Education

130303 Education Assessment and Evaluation

130304 Educational Administration, Management and Leadership

130305 Educational Counselling

130306 Educational Technology and Computing

130307 Ethnic Education (excl. Aboriginal and Torres Strait Islander, Maori and Pacific Peoples)

130308 Gender, Sexuality and Education

130309 Learning Sciences

130310 Maori Education (excl. Early Childhood and Primary Education)

130311 Pacific Peoples Education

130312 Special Education and Disability

130313 Teacher Education and Professional Development of Educators

130399 Specialist Studies in Education not elsewhere classified

GROUP 1399 OTHER EDUCATION. This group covers education not elsewhere classified, and has only one field:

139999 Education not elsewhere classified.

The SEO division, 93, EDUCATION AND TRAINING, covers R&D directed towards improving education and training, and has six groups:

9301 LEARNER AND LEARNING. This group covers R&D directed towards improving the learning outcomes of individual learners and has five objectives:

930101 Learner and Learning Achievement

930102 Learner and Learning Processes

930103 Learner Development

930104 Moral and Social Development (incl. Affect)

930199 Learner and Learning not elsewhere classified.

9302 TEACHING AND INSTRUCTION. This group covers R&D directed towards improving teaching and instruction, and has four objectives:

930201 Pedagogy

930202 Teacher and Instructor Development

930203 Teaching and Instruction Technologies

930299 Teaching and Instruction not elsewhere classified.

9303 CURRICULUM. This group covers R&D directed towards the improvement of curricula used in education, and has three objectives:

930301 Assessment and Evaluation of Curriculum

930302 Syllabus and Curriculum Development

930399 Curriculum not elsewhere classified.

9304 SCHOOL/INSTITUTION. This group covers R&D directed towards the improvement of school and educational institution learning environments, and has four objectives:

930401 Management and Leadership of Schools/Institutions

930402 School/Institution Community and Environment

930403 School/Institution Policies and Development

930499 School/Institution not elsewhere classified.

9305 EDUCATION AND TRAINING SYSTEMS. This group covers R&D directed towards the improvement of education and training systems at scales larger than individual schools or educational institutions, and has four objectives:

930501 Education and Training Systems Policies and Development

930502 Management of Education and Training Systems

930503 Resourcing of Education and Training Systems

930599 Education and Training Systems not elsewhere classified.

9399 OTHER EDUCATION AND TRAINING. This group covers R&D directed towards education and training not elsewhere classified. It includes Aboriginal and Torres Strait Islander, Maori and Pacific Peoples education outcomes; theory and methodology of education and training; equity and access to education; special needs education, including gifted and disabled learners; and transition from education to the workforce and employment. This group has nine objectives:

939901 Aboriginal and Torres Strait Islander Education

939902 Education and Training Theory and Methodology

939903 Equity and Access to Education

939904 Gender Aspects of Education

939905 Maori Education

939906 Pacific Peoples Education

939907 Special Needs Education

939908 Workforce Transition and Employment

939999 Education and Training not elsewhere classified.

B.6 Geographical

The **Australian Standard Geographical Classification (ASGC)** (ABS 2006b) is a complex system with seven interrelated structures. Within each structure there is a hierarchy of units

from the smallest (in each, a Census Collection District, or CD, which is equivalent to several suburban blocks – around 250 households) to Australia as a whole (not always defined in the same way).

Any dataset that includes Global Positioning System (GPS) geocoded data (longitude and latitude) can be classified according to ASGC with appropriate software. Similarly, a dataset that includes postcodes can be similarly classified (though there are some difficulties and anomalies, especially where there are large postcode areas). Mapping according to ASGC areas can then occur (with appropriate software).

The 'Main' structure of the ASGC has six levels: Australia, States/Territories, Statistical Division (SD), Statistical Subdivision (SSD), Statistical Local Area (SLA), and Census Collector District (CD). There are 69 SDs, which represent large, regional geographic areas, characterised by broadly identifiable social and economic links between the inhabitants and between the economic units within the region, under the unifying influence of one or more major towns or cities. There are 217 SSDs, and 1,426 SLAs. SLAs are based on the boundaries of local government areas (LGAs) wherever possible and appropriate. This is not always the case, largely because of the large size of many LGAs, so there is a separate structure (the 'Local Government Area' structure) where LGAs make up the level between states/territories and SLAs.

The 'Remoteness' structure is based on the classification of CDs according to the Accessibility/Remoteness Index of Australia (ARIA) (see below). There are five Remoteness Area (RA) categories:

- Major Cities of Australia: CDs with an average ARIA value of 0 to 0.2
- Inner Regional Australia: CDs with an average ARIA value between 0.2 and 2.4
- Outer Regional Australia: CDs with an average ARIA value between 2.4 and 5.92
- Remote Australia: CDs with an average ARIA value between 5.92 and 10.53
- Very Remote Australia: CDs with an average ARIA value greater than 10.53
- Migratory: off-shore, shipping and migratory CDs.

While every CD in Australia has a RA value, not all RAs are represented in each state/territory.

The **Australian Spatial Data Directory (ASDD)** <http://asdd.ga.gov.au/asdd/> was launched in 1998 to assist access to Australian spatial data through effective documentation and dissemination. It is supported by all Australian governments, and by business and non-profit organisations with an interest in spatial data, and is maintained by Geoscience Australia as part of its broader responsibility for the Australian Spatial Data Infrastructure.

B.7 Countries

The **Standard Australian Classification of Countries (SACC)** (ABS 2008a) is used both population and economic statistics that need to be classified by country. SACC (first released in 1998) replaced the Australian Standard Classification of Countries for Social Statistics (ASCCSS).

SACC provides the framework for country of birth data in DEEWR higher education student statistics, the ABS Census 'country of birth' data, and DIAC data on international movements into and out of Australia.

The criteria on which the classification structure are based are

- the geographic proximity of countries (the basic criterion)
- the similarity of countries in terms of social, cultural, economic and political characteristics
- the desirability that groups of countries lie within a single geographic continent.

The classification structure is according to major groups, minor groups and countries (four digit level). The major groups are as follows:

1 Oceania and Antarctica
2 North-West Europe
3 Southern and Eastern Europe
4 North Africa and the Middle East
5 South-East Asia
6 North-East Asia
7 Southern and Central Asia
8 Americas
9 Sub-Saharan Africa.

B.8 Cultural and Ethnic Groups (Ancestry)

The **Australian Standard Classification of Cultural and Ethnic Groups (ASCCEG)** (ABS 2005b) is the national standard for use by the ABS and other government and non-government agencies for the collection, aggregation and dissemination of data relating to ancestry, ethnicity and cultural diversity.

The classification structure is according to broad groups, narrow groups, and cultural and ethnic groups. The broad groups are similar to the SACC broad groups, but expressed as descriptions of peoples (thus 'Oceanian' and North-West European'). At the cultural and ethnic groups level there is divergence from the 'country' level of SACC. For example, For the Southern European (31) narrow group there are the following cultural and ethnic groups:

3101 Basque
3102 Catalan
3103 Italian
3104 Maltese
3105 Portuguese
3106 Spanish
3107 Gibraltarian
3199 Southern European, n.e.c. (includes Andorran, Galician, Ladin)

B.9 Languages

The **Australian Standard Classification of Languages (ASCL)**, second edition (ABS 2005a) is used in the collection, storage and dissemination of statistical and administrative data relating to the languages spoken in Australia. The first edition was published in 1997. The broad groups in the classification are as follows:

1 Northern European Languages
2 Southern European Languages
3 Eastern European Languages
4 Southwest and Central Asian Languages

5 Southern Asian Languages
6 Southeast Asian Languages
7 Eastern Asian Languages
8 Australian Indigenous Languages
9 Other Languages

There are around 150 languages listed under board group 8, Australian Indigenous Languages.

B.10 Socio-economic status

The **Australian Socioeconomic Index 2006 (AUSEI06)** is an authoritative, widely-used Australian scale for socio-economic status of occupations. The AUSEI06 is the most recent version of the 'ANU' scales that have been used to assign occupational status since 1965. It is based on the methodology developed for the International Socioeconomic Index, which takes account of the relationship between education, particular occupations, and income, and is developed using data from the most recent ABS Census.

To determine a value on the AUSEI06 scale, the particular occupation is first classified according to the Australian and New Zealand Standard Classification of Occupations (ANZSCO), which is the standard classification used for the ABS Census and other collections. That classification (at the major, sub-major, minor or unit group - or one, two, three or four digit level) is converted to a AUSEI06 scale value between 0.0 and 100.0. For example, all the medical practitioner occupations (GPs, surgeons, etc) are scaled to 100.0; secondary school teachers are scaled to 87.6, and most farm workers to 4.9. Syntax for SAS and SPSS[20] for converting ANZSCO occupation classifications (at each of the four levels) to AUSEI06 values are available. (It is recommended, where possible, that data coded to the unit group (four digit) level of ANZSCO be used when converting occupational data into AUSEI06 values.)

Information about AUSEI06 and its development, and downloads of the conversion syntax, are available on the website <http://acer.edu.au/ausei/>.

Socio-economic Indexes for Areas (SEIFA) are prepared by the ABS. The four indexes in SEIFA 2006, and the 2006 Census variables from which they are derived, are:

- *Index of Relative Socio-economic Disadvantage* – variables related to disadvantage, such as low income, low educational attainment, unemployment, and dwellings without motor vehicles
- *Index of Relative Socio-economic Advantage and Disadvantage* – a continuum of advantage (high values) to disadvantage (low values) which is derived from variables related to both advantage and disadvantage, like household with low income and people with a tertiary education
- *Index of Economic Resources* – variables like the income, housing expenditure and assets of households

[20] SAS is statistical analysis software produced by SAS Institute Inc. since 1976 <http://www.sas.com/>. SPSS (originally, 'Statistical Package for the Social Sciences') has been produced by SPSS Inc. since 1968 <http://www.spss.com/>.

- *Index of Education and Occupation* – variables relating to the educational and occupational characteristics of communities, such as the proportion of people with a higher qualification or those employed in a skilled occupation.

SEIFA is available for geographic areas down to a Census Collection District (CD).

For information about SEIFA, see <http://www.abs.gov.au/websitedbs/D3310114.nsf/home/Seifa_entry_page>.

Spreadsheets for each of the four SEIFA 2006 indexes can be downloaded for various geographical classifications from the ABS site at <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/2033.0.55.001Main+Features12006?OpenDocument>.

Note that SEIFA does not represent the particular situation of each individual in an area. In fact, it is to risk the ecological fallacy to impute from the SEIFA value of an area the socioeconomic status of an individual, family, or small group (such as students from a particular school, especially if several schools draw from the same area). Baker and Adhikari (2007) prepared a paper for the ABS Methodology Advisory Committee that analysed the applicability of SEIFA at a small area level to individuals and families. They found that

> The analysis shows that there is a large amount of heterogeneity in the socio-economic status of individuals and families within small areas. These findings indicate that there is a high risk of the ecological fallacy when SEIFA is used as a proxy for the socio-economic status of smaller groups within an area and there is considerable potential for misclassification error. (Baker & Adhikari 2007, p. 1)

The **Accessibility/Remoteness Index of Australia (ARIA)** was developed in the late 1990s by the National Key Centre for Social Applications of GIS (GISCA) at the University of Adelaide, with funding from the Department of Health and Ageing (DoHA). In ARIA, 'remoteness' is based on road distance from any point to the nearest town (service centre) in each of five population size classes. The population size of the service centre is used as a proxy for the availability of a range of services, and road distance is used as a proxy for the degree of remoteness from those services. The ARIA values are between 0.0 and 15.0.

While ARIA indicates levels of likely disadvantage caused by remoteness, it is not intended to be a socioeconomic index.

In the Australian Standard Geographical Classification, ARIA is the basis of the 'remoteness structure' (see above).

Appendix C National Statistical Service: Key Principles

Preamble

The wide availability of statistical information to assist and encourage informed decision making, research and discussion within Governments and the community is fundamental to open government and the democracy which we enjoy in Australia.

The National Statistical Service (NSS) initiative is a recognition of the fact that much of the statistical information required to inform policy makers is contained in the administrative systems of government organisations. The NSS includes important statistics that can be, and should be, generated as a by-product of the administrative processes of government, and the outputs of direct statistical collections conducted to support government activities.

The Vision of the National Statistical Service (NSS) is all government agencies working together to deliver the statistics required by Australia. This will be achieved through increasing the availability, accessibility and useability of information derived from key administrative and survey data sets, applying sound statistical and data management principles and practices, and forging statistical partnerships to share knowledge and expertise.

Maximising the usefulness, availability and comparability of these data will ensure improved policy formulation through access to better, broader and more comparable information, better monitoring of the effectiveness and efficiency of program services, improved access to and use made of the data by the wider community, and reduced overall costs for the provision of government information services.

The Fundamental Principles of Official Statistics (see Attachment 1) were adopted in 1994 by the United Nations and have been accepted internationally as representing sound and workable principles for the operation of an official statistical agency. In recent years, international statistical organisations have developed frameworks for describing the quality of data. The NSS Key Principles recognises the importance of both the fundamental principles and quality frameworks and encompasses both of these developments.

The objectives of the NSS Key Principles are to assist government organisations, at Commonwealth, State/Territory and local levels, to produce and publish Australia's National Statistics, and promote 'best practice' to guide the achievement of high standards in the collection, compilation and dissemination of statistics.

Key Principles

Statistical Integrity

1. Be objective in data definition, analysis, interpretation and release of statistics.
2. Be open about all aspects of the statistical process:
   - set, and publicise in advance, the dates for and nature of statistical releases;
   - publish methodologies used in producing statistics; and

This Appendix sets out the full text of the NSS Key Principles from <http://www.nss.gov.au/nss/home.NSF/pages/NSS+Key+Principles?OpenDocument>

- invite and respond promptly to comment.

Relevance

3. Consult widely with government, business and the community to ensure the statistical information produced supports debate about current and emerging issues, within available resources.

Coherence

4. Use standard classifications, standards and frameworks. Explain deviations from the relevant international/national standards.
5. Ensure that the statistical methodology and data remain internally consistent over time. Explain reasons for any changes that occur between collection periods.

Timeliness

6. Allow enough time to check the data for a reasonable level of accuracy and plan to release the statistics as soon as possible after their collection.
7. Where a publication date has been advertised, ensure that the statistics are released on this date.

Accessibility

8. Ensure that important statistics are compiled from key administrative and survey data sets relating to government programs and activities.
9. Provide all Australians with ready access to quality statistics.

Interpretability

10. Provide analyses and explanations where they help the interpretation of statistics.
11. Be open about the quality of the statistics, so that users can better understand and interpret them.

Accuracy

12. Ensure sound statistical practices are followed for collecting, processing, storing and presenting statistical data.

Statistical Professionalism

13. Ensure necessary professional statistical skills are developed or acquired and used in the production of statistics.

Trust of Data Providers

14. Place only the minimum reporting load necessary on data providers, commensurate with administrative requirements, priority statistical objectives and sound statistical practice.
15. Explain clearly to data providers how the information provided may be used.
16. Ensure compliance with privacy principles, confidentiality guarantees and other undertakings to data providers.

References

Brackstone G.1999, Managing Data Quality in a Statistical Agency, *Survey Methodology*, Vol 25, No. 2, Statistics Canada.

Carson, C. 2001, *Toward a Framework for Assessing Data Quality*, IMF Working Paper, WP/01/25, International Monetary Fund, Washington.

Attachment: Fundamental Principles of Official Statistics (United Nations)

Background

The notion that international endorsement of a set of principles for official statistics was necessary was born in the Conference of European Statisticians. At the end of the eighties the countries of Central Europe began to change from centrally planned economies to market-oriented democracies. A few years later the Soviet Union was dissolved. Among the many changes that these developments generated was the need for complete transformation of the national statistical systems. Part of this transformation process was about redefining the role of official statistics, as well making it clear to governments and other users of statistics that a good system of official statistics must meet certain general criteria. In order to get this message across, and to assist heads of national statistical offices to defend the position of their institutes, the Fundamental Principles of Official Statistics were developed. While being adopted by the Conference of European Statisticians and its parent body the Economic Commission for Europe, statisticians in other parts of the world began to realize that these principles had a wider significance. In that context, an international discussion process was started up, ending with the adoption of the Fundamental Principles by the United Nations Statistical Commission, the highest statistical authority in the world. The United Nations Statistical Commission, in its Special Session of 11-15 April 1994, adopted the Fundamental Principles of Official Statistics, earlier set out in the Economic Commission for Europe's Decision C (47), but incorporating a revised preamble.

Fundamental Principles of Official Statistics

Preamble

The Statistical Commission,

- Bearing in mind that official statistical information is an essential basis for development in the economic, demographic, social and environmental fields and for mutual knowledge and trade among the States and peoples of the world.
- Bearing in mind that the essential trust of the public in official statistical information depends to a large extent on respect for the fundamental values and principles which are the basis of any society which seeks to understand itself and to respect the rights of its members.
- Bearing in mind that the quality of official statistics, and thus the quality of the information available to the Government, the economy and the public depends largely on the cooperation of citizens, enterprises, and other respondents in providing appropriate and reliable data needed for necessary statistical compilations and on the cooperation between users and producers of statistics in order to meet users' needs.
- Recalling the efforts of governmental and non-governmental organizations active in statistics to establish standards and concepts to allow comparisons among countries,
- Recalling also the International Statistical Institute Declaration of Professional Ethics,
- Having expressed the opinion that resolution C (47), adopted by the Economic Commission for Europe on 15 April 1992, is of universal significance,
- Noting that, at its eighth session, held in Bangkok in November 1993, the Working Group of Statistical Experts, assigned by the Committee on Statistics of the Economic and Social Commission for Asia and the Pacific to examine the Fundamental Principles, had agreed in

principle to the ECE version and had emphasized that those principles were applicable to all nations,

- Noting also that, at its eighth session, held at Addis Ababa in March 1994, the Joint Conference of African Planners, Statisticians and Demographers, considered that the Fundamental Principles of Official Statistics are of universal significance,

Adopts the present principles of official statistics:

Principle 1. Official statistics provide an indispensable element in the information system of a democratic society, serving the Government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honor citizens' entitlement to public information.

Principle 2. To retain trust in official statistics, the statistical agencies need to decide according to strictly professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage and presentation of statistical data.

Principle 3. To facilitate a correct interpretation of the data, the statistical agencies are to present information according to scientific standards on the sources, methods and procedures of the statistics.

Principle 4. The statistical agencies are entitled to comment on erroneous interpretation and misuse of statistics.

Principle 5. Data for statistical purposes may be drawn from all types of sources, be they statistical surveys or administrative records. Statistical agencies are to choose the source with regard to quality, timeliness, costs and the burden on respondents.

Principle 6. Individual data collected by statistical agencies for statistical compilation, whether they refer to natural or legal persons, are to be strictly confidential and used exclusively for statistical purposes.

Principle 7. The laws, regulations and measures under which the statistical systems operate are to be made public.

Principle 8. Coordination among statistical agencies within countries is essential to achieve consistency and efficiency in the statistical system.

Principle 9. The use by statistical agencies in each country of international concepts, classifications and methods promotes the consistency and efficiency of statistical systems at all official levels.

Principle 10. Bilateral and multilateral cooperation in statistics contributes to the improvement of systems of official statistics in all countries.

Appendix D Student teacher specialisations data

Data on secondary initial teacher education completions (actual and expected) by teaching area is frequently sought from education faculties by school authorities and others. If this area is to become a dataset within the data repository for teacher education, an agreed set of classifications and guidance for collection will need to be developed. While secondary specialisations are the category most frequently sought, data collection including other specialisations would ensure a consistent, comprehensive and coherent dataset.

The field of education (FoE) classifications used by DEEWR for courses are those of the *Australian Standard Classification of Education* (ASCED) (ABS 2001). Those in the broad field of 'Education' (Broad Field 07) (pp. 149 – 53) are set out in Box 4 below.

Box 4 Australian Standard Classification of Education, Broad Field 07

07 EDUCATION
- 0701 Teacher Education
  - 070101 Teacher Education: Early Childhood
  - 070103 Teacher Education: Primary
  - 070105 Teacher Education: Secondary
  - 070107 Teacher-Librarianship
  - 070109 Teacher Education: Vocational Education and Training
  - 070111 Teacher Education: Higher Education
  - 070113 Teacher Education: Special Education
  - 070115 English as a Second Language Teaching
  - 070117 Nursing Education Teacher Training
  - 070199 Teacher Education, n.e.c.
- 0703 Curriculum and Education Studies
  - 070301 Curriculum Studies
  - 070303 Education Studies
- 0799 Other Education
  - 079999 Education, n.e.c.

The ASCED classifications are not fully consistent with the reality of or needs for classification in initial and post-initial teacher education. First, 'Nursing Education Teacher Training' appears out of place, especially as there are not equivalent categories for other professions/occupations excect with generic 'Teacher Education: Higher Education' and 'Teacher Education: Vocational Education and Training'. Second, there is no 'Teacher Education: Middle School' classification, though the ANZSCO classification includes the occupation of 'Middle School Teachers' as well as primary, secondary and special education teachers in the 'Schools Teachers' minor group (ABS & Statistics New Zealand 2006, p. 246). Third, there are not the subject specialisation classifications that are so important for teacher educators, school authorities, the teaching profession and other stakeholders. In addition,

there are difficulties with DEEWR data because in a number of individual courses there are students who will graduate with qualifications in different narrow fields (such as either primary or secondary), or who might graduate with a qualification covering more than one narrow field (such as becoming qualified as both a secondary and a VET teacher).

As a consequence of these inadequacies and difficulties there is a need for supplementary data collected directly from HEPs or faculties of education.

In addition to the ASCED classifications, DEEWR separately classifies initial teacher education courses (and thus students undertaking such courses) in the 'special type code' of 'Initial Teacher Training'. A significant number of courses for specialist teaching qualifications are only available in post-initial programs. This is especially the case for special education and for re-training in shortage fields. There are also post-initial courses in fields that may not be formally recognised as 'specialisations', but are very important for the work of the teaching professions and for workforce planning. These include courses in leadership (largely, but not wholly, directed to current or aspiring principals), and courses in Indigenous education. Therefore it may be appropriate to obtain data on specialisations in post-initial as well as initial courses.

Draft guidance notes

Each student teacher should be fully accounted for but not double-counted. In most cases secondary student teachers will be preparing to become qualified to teach in two areas (usually a major and a minor teaching area). Therefore students undertaking two specialisations should be counted as 0.5 in each area. If a student's teaching areas are all in one of the listed areas (such as physics and chemistry, both in 'science', or history and geography, both in 'social sciences'), each should be counted to a total of 1.0. If a student is undertaking specialisations in one secondary teaching area and one non-secondary area (such as non-school adult VET), the secondary specialisation should be counted at 0.5 (and the adult VET where appropriate also at 0.5). Thus the sum of completions for all secondary specialisations should be the same as the total FTE for all secondary student teacher completions.

The possible list of specialisations set out below is broadly consistent with the ASCED for teacher education, with sub-classifications and additions, and excluding 'nursing education teacher training'.

It may be appropriate to make further sub-classifications, such as, at the secondary level, physics, chemistry, and biology in science, and history and geography in social sciences.

The classifications selected for a particular data collection exercise would need to maintain the balance between continuity of data from year to year, and consistency with developments in curriculum content and structures and importance of data in particular areas (such as shortages in certain sub-specialisations).

Early childhood (total)

(non-school settings only)	(non-school and school)	(school only)
0 – 3 years	0 – 8 years	5 – 8 years
0 – 5 years	3 – 8 years	

Primary (total)

Primary special education	Other primary specialisations?

Middle school (total)

Secondary (total)

Art	IT	Social Sciences & Environment
Business	LOTE (please specify)	Special education
Career Education	Mathematics	TESOL
Design and Technology	Music	VET (in schools)
Drama	Physical & Health Education	Other (please specify)
English	Science	
Home Economics	School psychology	

Adult VET (total)

Higher Education (total)

Other, especially for post-initial programs (such as Leadership, Administration, Indigenous Education, Teacher Librarianship, Adult TESOL) (total and subtotals)

Appendix E Data requirements of a teacher workforce projections model

This appendix discusses data used in possible future modelling of school teacher supply and demand projections that could be used to inform initial teacher education intakes and other research topics and policy areas of concern to teacher educators, school authorities, and teacher professional regulatory and representative organisations. The model is based on that used in Preston (2000), with additional inputs such as net migration. Similar models would be possible for early childhood (non-school) teachers and VET teachers, though key areas of uncertainty are more significant.

An illustration of such a model is provided in Figure 2.

In the areas concerned with teachers and student teachers, additional information on specialisations, especially secondary subject specialisations would be desirable (Owen et al. 2008). While collection of such data for student teachers (completions) is feasible for the DRTE (see Appendix D, and section 5.2 on a longitudinal survey of student teachers), it is not a current regular collection.

The focus here is on options for including the relevant data within the DRTE, providing links to external data sources, or providing information about external data sources.

School student enrolment projections, primary and secondary, by state and territory, for five to ten years into the future

DEEWR and state/territory authorities prepare primary and secondary school student enrolment projections that are generally accessible on request. As these are irregularly updated and for some purposes projections from different sources would be preferable, and as they are not directly related to teacher education, it may not be appropriate to maintain any actual student enrolment projections in the DRTE. However, information on access to such information would be appropriate. (A more refined projections model may require disaggregation of government and nongovernment school enrolment projections.)

Student-teacher ratios, primary and secondary, by state and territory (with information to assist estimates for future years)

The student-teacher FTE ratios data is published annually by the ABS as part of the *Schools Australia* (Cat. No. 4221.0) collection. This simple, regularly published data could be placed in the DRTE.

Persons to full-time equivalent ratios for teachers, primary and secondary, by state and territory (with information to assist estimates for future years)

This data is not readily available, though it is important for a range of teacher workforce research and policy areas. The ABS *Schools Australia* (Cat. No. 4221.0) collection does not publish the data disaggregated by primary and secondary levels, but just by school sector and states and territories. However, unpublished raw data collected by the ABS from school authorities (and individual independent schools) would include the necessary information. Alternatively, school authorities would have the data in human relations management systems for teachers for whom they are responsible, and may make such data available. However, collection from independent schools is likely to be difficult outside the DEEWR/ABS collection process.

Estimated future net separation rates of teachers (FTE)

There are a number of methods for estimating future net separation rates of teachers. All are problematic to some degree – for example an individual school authority may maintain good data on individuals who move in and out of teaching in their jurisdiction, but data is nonexistent (or poor) regarding movements between jurisdictions (including between individual independent schools).

A method for estimating future net separation rates is based on ABS Census data on the population with teaching qualifications, whether teaching or not, by age, combined with teacher workforce age projections and projected total teacher workforce numbers. Refinements of this method include incorporating FTE to persons ratios by age, and age of new entrants (particularly, initial teacher education graduates). The Census data could be placed in the DRTE as it becomes available every five years (section 6.1.9).

Net overseas migration (with information for estimates for future years)

Some information, including by occupation (such as school teacher) by category of long term or permanent movement, by country of origin or destination, by age is available from DIAC on request (section 6.1.11). Relevant data could be deposited in the DRTE, and be available for a range of purposes, including planning future initial and post-initial teacher education courses for overseas trained teachers, as well as general teacher workforce planning

The ABS Census provides data on individuals' locations five years earlier (at the previous Census), as well as detailed information on occupation, qualifications, and so on.

Nationally consistent data on migration of teachers could become available in the future in collections made and managed by teacher regulatory authorities.

Net interstate migration of qualified teachers (with information for estimates of availability for actual teaching vacancies and for estimates for future years)

The ABS Census provides data on individuals' locations five years earlier (at the previous Census), as well as detailed information on occupation, qualifications, and so on. ABS *Migration, Australia* (ABS 2008b) provides information on interstate migration by age, sex and country of birth, but not qualification or occupation.

Nationally consistent data on interstate migration of teachers could become available in the future in collections made and managed by teacher regulatory authorities.

Current shortage or surplus of teachers (with information for estimates of availability for actual teaching vacancies and for estimates for future years)

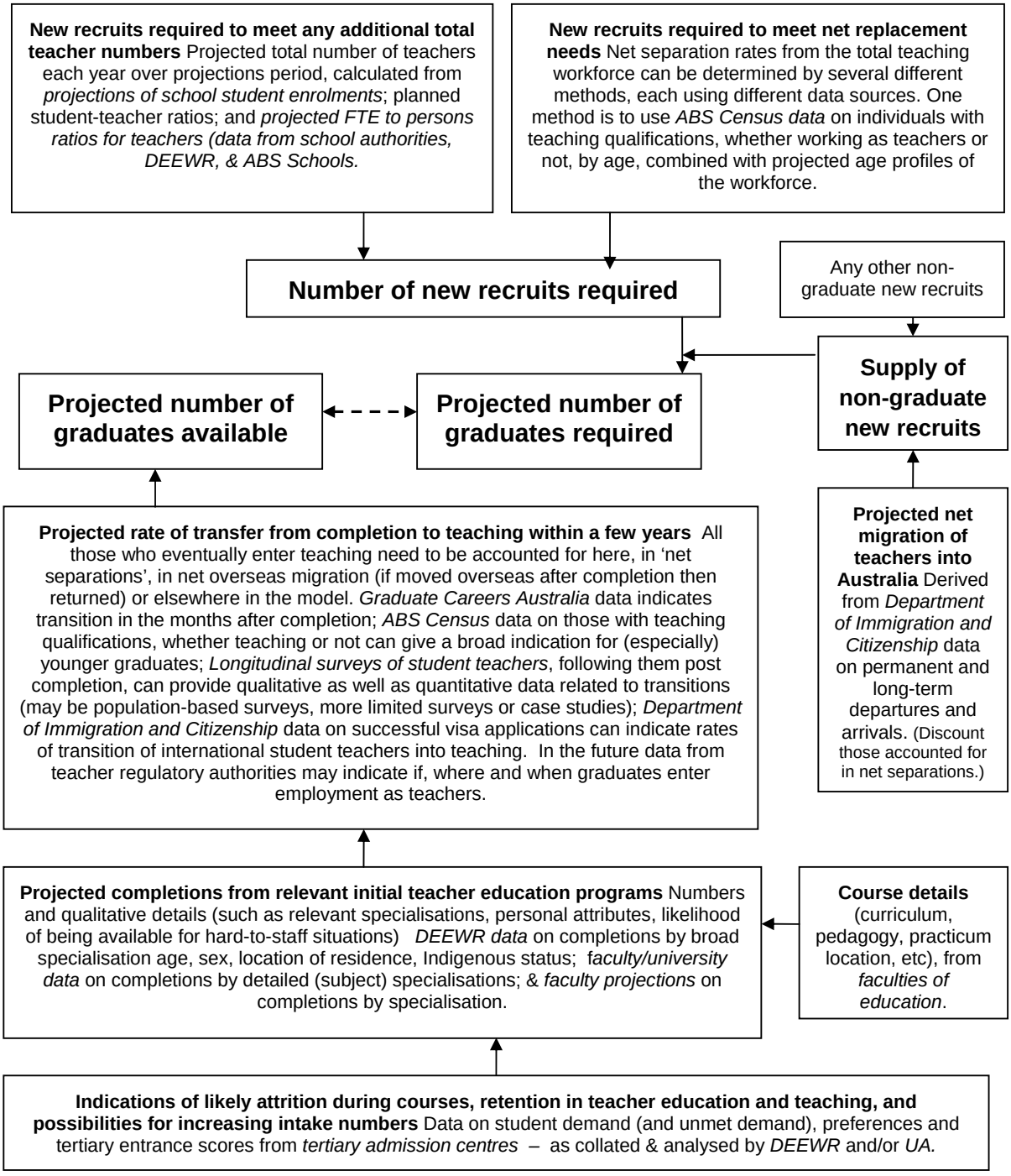
This is very difficult to measure, and the appropriate measures are matters of debate. There tend always to be surpluses in certain localities and/or teaching specialisations co-existing with shortages in other localities and teaching specialisations. This is probably best estimated as required for a particular project, in consultation with school authorities and others (such as principals associations). Baseline (current or recent year) shortages (and surpluses) are important to estimate because they do, in part, get carried over from year to year.

Figure 2 Data requirements for workforce planning

An illustration of major elements in a possible model for projecting supply and demand for teacher education graduates at a particular level (eg. secondary) in a particular jurisdiction.

The work could inform plans for future initial teacher education intakes (numbers and desired student attributes), course development or modification, pedagogy and curriculum, as well as school authorities' teacher recruitment, retention and staff development strategies.

Particular data sources are in italics.



Appendix F Staff in Australia's Schools: Teacher workforce planning data needs

The Staff in Australia's Schools project was commissioned by DEEWR in June 2006, and conducted by the Australian Council for Educational Research and the Australian College of Educators. The two reports of the project (Owen, Kos & McKenzie 2008, and McKenzie et al 2008) were published in January 2008. Those reports will be outlined in turn.

Teacher Workforce Data and Planning Processes in Australia (Owen, Kos & McKenzie 2008) is based on consultations with a wide range of organisations and individuals in all states and territories in 2006, and a review of Australian and international reports and other literature. It discusses:

- the current availability of research and data on Australian teacher and school leader characteristics
- current processes and data used for school teacher and leader workforce planning
- approaches to teacher workforce planning and data taken in international organisations and other countries
- approaches to workforce planning and data taken in other professions in Australia
- recommendations on longer-term national collaborative approaches to obtain data to support Australian teacher and school leader workforce planning (p. 14).

The report is detailed, and much is of relevance to this scoping study for a data repository for teacher education. One theme is the lack of data on teaching specialisations in many collections (from diverse sources, and on student teachers, beginning teachers, other current teachers, qualified teachers not currently teaching, and immigrant and emigrant teachers). Also commented on were the lack of consistency in definitions and other features between collections, and the limited scope of some collections.

The recommendations in the report are as follows:

> *Recommendation 1:*
>
> Noting MCEETYA's:
>
> i) agreement to develop a strategic framework for a national approach to workforce planning in education, including the need to develop a process to achieve common core data sets and definitions; and
>
> ii) its referral of this task to the Improving Teacher and School Leader Capacity (ITSLC) Working Group; it is suggested that the Australian Government propose to the ITSLC Working Group that it establish a workforce data sub-group to coordinate and oversee data collection and analysis in relation to Australian school teachers and leaders. As part of this, the sub-group could give consideration to utilising specific workforce planning expertise and communication links established with broader networks involved in workforce planning issues.
>
> *Recommendation 2:*
>
> It is suggested that the Australian Government propose to the ITSLC Working Group that it should consider reviewing existing data collection models from education and other professions and consult widely to develop a framework which outlines the principles for collaboration among key stakeholders, including protocols regarding the use of data and issues of public access.

Recommendation 3:

It is suggested that the Australian Government propose to the ITSLC Working Group that, in relation to MCEETYA's agreement to develop a process to achieve common core data sets and definitions, and noting the potential of this to facilitate the pooling and sharing of workforce data by government and non-government systems in the long-term, it should consult widely to ensure its future implementation by teacher employers, teacher education institutions and teacher registration authorities, and a protocol on data sharing.

Recommendation 4:

It is suggested that the Australian Government propose to the ITSLC Working Group that it consider development of a regular, well-resourced and well-promoted cycle of survey data collection from the Australian teacher and school leader workforce based on the data domains covered in the current Staff in Australia's Schools survey.

Recommendation 5:

It is suggested that the Australian Government propose to the ITSLC Working Group that it consider the development and implementation of data collections, involving collaboration with stakeholders, that address issues related to attitudes towards a teaching career and potential barriers to career entry among senior secondary students, potential career changers, those who are qualified but not currently teaching, and under-represented groups.

Recommendation 6:

It is suggested that the Australian Government propose to the ITSLC Working Group that it consider the development and implementation of data collections, involving collaboration with stakeholders, in teacher education data, including establishing longitudinal studies regarding pre-service teacher education to early career phases and in regards to leadership programs and impacts (pp. 9 – 10).

The report authors conclude that:

> There are two broad priorities for teacher workforce data and planning in Australia. The first is to ensure that, within a highly diversified and decentralised system of teacher preparation and employment, individual decision makers have the data they need to make the best possible decisions for their circumstances. The second priority is that there needs to be greater collaboration on workforce planning matters across Australia because of the common issues affecting teachers no matter where they work.
>
> The vision that needs to guide this process is that workforce planning data for such a key profession as teaching has to be a collective endeavour across all of the groups involved in schooling. Data collection and analysis need to be seen to be informing actions, with the ultimate goal being improvements in the quality of education for Australian students and the benefit of society (p. 10).

These conclusions, with a sharper focus on teacher education (initial and post-initial), are relevant to this scoping study.

Staff in Australia's Schools 2007 (McKenzie et al 2008) outlines the results of the Staff in Australia's Schools (SiAS) survey of the four populations of Australian primary teachers, secondary teachers, primary leaders and secondary leaders ('leaders' were defined as those in principal and deputy or vice principal roles or equivalent).

The survey arose out of concerns expressed in Australian and international reports about inadequacy of data regarding matters such as the nature and severity of teacher shortages, out-of-field teaching, teacher attrition and retention, reasons for entry and leaving, and the potential supply of graduates, entrants from other careers, or re-entrants to teaching (pp. 1 – 2). The survey updated and extended the 1999 survey of teachers in Australian schools carried

out by the Australian College of Educators (then the Australian College of Education), which followed earlier surveys in 1963, 1979 and 1989 (p. 2).

The surveys were administered online, and covered the following topics for primary and secondary teachers:

- basic demographics (including age, sex, country of birth and indigenous status)
- qualifications and current study
- motivation for becoming a teacher
- current teaching position (including basis and length of employment, levels and areas taught, salary and workload)
- professional learning activities (including number of activities engaged in, the impact of those activities, and desired areas for future development)
- career in teaching (including pathway to teaching, past occupations, length of time as a teacher, and if relevant, amount of time spent working in different school sectors and jurisdictions).

In addition, early career teachers were asked questions about their:

- perceived readiness for teaching and the usefulness of the programs that were available to them once commencing work as a teacher
- future career intentions (including intentions and motivations for promotion within schools or leaving the profession)
- job satisfaction
- views on strategies to enhance attracting and retaining teachers.

The primary and secondary leaders survey covered:

- basic demographics (including age, sex, country of birth and indigenous status)
- qualifications and current study
- motivation for becoming a teacher and a leader
- current leadership position (including basis and length of employment, salary and workload)
- professional learning activities (including number of activities and preparation for the leadership role
- career in teaching (including pathway to teaching, past occupations, length of time as a teacher and leader, and if relevant, amount of time spent working in different school sectors and jurisdictions)
- future career intentions (including intentions and motivations for promotion within schools and leaving the profession)
- job satisfaction.

In addition the following topics were covered in items completed by school principals only:

- school staffing (including areas of decision-making authority, salary structures, vacancies, retention, and attrition)
- preparedness of recent graduates
- views on attracting and retaining staff (pp. 4-5).

The teacher samples were intended to be representative of primary and secondary teachers in all states and territories and sectors. A two-stage cluster design was used to determine the sample, with schools first selected, then a fixed number of teachers within each school and the principal and deputy/vice principal invited to take part (see p. 5 of information about sample selection). The final response rates were lower than intended: 30% for primary teacher, 33% for secondary teachers, 35% for primary leaders, and 37% for secondary leaders (pp. 9 – 10). Non-response bias was discussed and investigated (pp. 14 – 15; Appendix 4, section A4). The report does not disaggregate results at the state/territory level because of the variability of response rates at that level.

The report includes more than 100 pages of tables and text on survey results, providing a very rich source of data and analysis, much of which is relevant to teacher education (initial and post-initial).

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