CIRES
Centre for International Research on Education Systems

mitchell INSTITUTE

A Blueprint for initial teacher education and teacher workforce data

DECEMBER 2015

VICTORIA UNIVERSITY
MELBOURNE AUSTRALIA

Acknowledgements

The Australian Department of Education and Training, in conjunction with the Australian Institute for Teaching and School Leadership (AITSL), contracted the Mitchell Institute for Health and Education Policy (The Mitchell Institute) and the Centre for International Research on Education Systems to develop a Blueprint for initial teacher education and teacher workforce data. The Mitchell Institute and CIRES are grateful to the many individuals and organisations who agreed to be consulted for this project, often at very short notice. Their willingness to contribute their expertise, insights and documents has made a very significant contribution to the execution of this project and has been greatly appreciated.

About CIRES

The Centre for International Research on Education Systems (CIRES) is a national centre for research on education and training systems. CIRES aims to investigate the origins and consequences of low achievement in education and to work with governments and education providers to improve educational opportunities and outcomes.

About the Mitchell Institute

The Mitchell Institute at Victoria University is an independent policy think tank that works to improve the connection between evidence and policy reform. The Institute works with communities, governments and institutions to build an education system that is oriented towards the future, creates pathways for individual success, and meets the needs of a globalised economy.

Table of contents

Table of contents **2**

Tables and Figures **4**

Acronyms and Abbreviations **5**

Executive Summary **7**

1. Purpose **11**

1.1. Report Structure 12

2. Policy Context **13**

2.1. Teacher education in government policy 13

2.2. Teacher effectiveness 13

2.3. Supply and demand 14

2.4. The rationale for a national ITE and teacher workforce dataset 15

2.5. National Health Workforce Data 20

3. Methodology **21**

3.1. Phase 1: Stakeholder consultations and desktop research – development of the Data Framework 21

3.2. Phase 2: Data mapping 22

3.3. Phase 3: Blueprint 22

4. The Data Framework **23**

4.1. Data on the outcomes of ITE 23

4.2. Data for teacher supply and demand modelling, workforce planning and labour market information 26

4.3. Data for teacher workforce profiling and benchmarking 29

4.4. The effectiveness of the broader teaching workforce and school leaders 30
4.5. The Data Framework 30
5. Data Mapping 33
6. Blueprint for initial teacher education and workforce data 37
6.1. Options for collecting data for the Data Framework 37
6.2. The unique teacher identifier 43
6.3. Data sharing and warehousing 44
6.4. Indicative costing of recommended approaches to data collection and warehousing 46
6.5. Implementation of a national ITE and teacher workforce dataset 47
Appendix 1: Stakeholders interviewed A1
Employer bodies A1
Teacher regulatory/ITE accreditation bodies A2
Initial teacher education providers A2
Representative bodies – schools A2
Representative bodies – universities A3
Technical experts A3
Other experts A3
Appendix 2: Interview schedule A4
Appendix 3: Analysis of stakeholder consultations A6
Appendix 4: Review of literature – ITE and the teacher workforce data A13
Appendix 5: Lessons from the health professions A19
Appendix 6: Staff in Australia's schools teacher questionnaire A23
Appendix 7: Summary information on data collections A40
Appendix 8: Teacher regulatory authorities – operations and data collection A43
Appendix 9: Frequency table - ITE programs graduate numbers A45
Appendix 10: Addition information on teacher workforce data items A46
References A47

Tables and Figures

Table 1: Minimum data set: outcomes of ITE **25**
Table 2: Minimum data set: teacher supply and demand modelling **28**
Table 3: Framework for Initial Teacher Education and Teacher Workforce Data **32**
Table 4: Data Mapping **35**
Table 5: Data collection options against the desired data attributes **39**
Table 6: Summary of NTWD data items **51**

Figure 1: Data on the outcomes of ITE **24**
Figure 2: Teacher supply and Demand Conceptual Framework **27**
Figure 3: ITE and teacher workforce data sharing and warehousing **45**
Figure 4: Population of data warehouse with the data from the Data Framework **50**
Figure 5: Implementation flowchart **58**

Acronyms and Abbreviations

ABS	Australian Bureau of Statistics
ACARA	Australian Curriculum, Assessment and Reporting Authority
ACER	Australian Council for Education Research
AEEYSOC	Australian Education, Early Childhood Development and Youth Affairs Senior Officials Committee
AHPRA	Australian Health Practitioner Regulation Agency
AIHW	Australian Institute of Health and Welfare
AITSL	Australian Institute for Teaching and School Leadership
APSP	Australian Professional Standard for Principals
APST	Australian Professional Standards for Teachers
ATAR	Australian Tertiary Admissions Rank
ATRA	Australian Teacher Regulatory Authorities
BOSTES	NSW Board of Studies, Teaching and Educational Standards
CHESSN	Commonwealth Higher Education Student Support Number
CIRES	Centre for International Research on Education Systems
COAG	Council of Australian Governments
Department	The Department of Education and Training (Commonwealth)
EPIMS	Educational Personnel Information Management System (Massachusetts, USA)
ESES	Elementary-Secondary Education Survey (Canada)
ESS	Employer Satisfaction Survey
GOS	Graduate Outcomes Survey
GTCS	General Teaching Council for Scotland
HEIMS	Higher Education Information Management System
HESDC	Higher Education Student Data Collection
HWA	Health Workforce Australia
IPRC	Institutional and Program Report Card (USA)
ITE	Initial Teacher Education
KCEWS	Kentucky Center for Education and Workforce Statistics (USA)
MATSITI	More Aboriginal and Torres Straites Islander Teachers Initiative
MEPID	Massachusetts Education Personnel ID
Mitchell Institute	The Mitchell Institute for Health and Education Policy
MSOD	Medical Schools Outcomes Database and Longitudinal Tracking
NEPS	National Educational Panel Study (Germany)
NHWDS	National Health Workforce Dataset
NMBA	Nursing and Midwifery Board of Australia
NRAS	National Registration and Accreditation Scheme
NTWD	National Teaching Workforce Dataset

QCT	Queensland College of Teachers
SiAS	Staff in Australia's Schools
STEM	Science, Technology, Engineering, Mathematics
TALIS	Teachers and Learning International Study
TEESC	Teacher Education Expert Standing Committee
TEMAG	Teacher Education Ministerial Advisory Group
TRA	Teacher Regulatory Authority
TWINS	Teacher Workforce Information System (Alberta, Canada)
TWIS	Teacher Workforce Information System (Alberta, Canada)

Executive Summary

The school teaching workforce is an important policy focus of Australian State, Territory and Commonwealth governments. Research has established teacher effectiveness as the strongest influence on student learning outcomes of all school-based factors. The closely related area of the quality of school leadership rates second among these influences.

The school teaching workforce is Australia's largest professional group. In 2014 there were over 400,000 registered school teachers nationally, with around an additional 17,000 new teaching graduates each year from over 400 Initial Teacher Education (ITE) programs across Australia.

A sustainable supply of quality teachers, principals and other school leaders is essential to the quality of the education system and student learning. The effective management of this supply is far more complex than simply matching the number of available teachers and school leaders to the number of students in schools. Teacher workforce planning involves ensuring an appropriate skills mix within the profession to provide the best possible education to all students, regardless of their year level, geographic location, curriculum choices or socio-economic status. Effective workforce planning and development involves detailed understanding of the many factors affecting teacher supply and demand in Australia. Reflecting this priority, in 2012 the Australian Government requested the Productivity Commission investigate issues of teacher workforce policy across Australia. The Commission concluded that imbalances in supply and demand exist and are "costly for both students and the wider community" (Productivity Commission 2012, p. 11).

More recently, with the establishment of the Teacher Education Ministerial Advisory Group and the release of its report "Action Now: Class Ready Teachers" (TEMAG 2014), national policy focus has included the need to strengthen initial teacher preparation through a more rigorous and consistent system for accreditation of teacher education courses and other initiatives to improve key aspects of teacher preparation.

Towards a national initial teacher education and teacher workforce dataset

Initial teacher education and the teacher workforce are national concerns requiring the effective collaboration of many key stakeholders: State, Territory and the Comonwealth governments, teacher regulatory authorities (TRAs), teacher education providers, teacher employers, schools and their communities, representative groups and individual teachers. While there are large sets of data on the teaching workforce and initial teacher education, there are currently limitations in what we know about the outcomes of ITE programs and workforce supply and demand at a national, state and territory level.

The highest priority area for stakeholders consulted for this project was in the improved collection and reporting of ITE outcomes data. For accredited ITE programs, data is not currently available on teacher employment outcomes, teacher satisfaction with their ITE program and early career induction, and employer and mentor views of teacher classroom readiness. The implementation of the national ITE and teacher workforce dataset would facilitate the reporting of such data and provide important insights into the relative success of ITE programs and rate and evenness of improvements in ITE.

For teacher supply and demand, it is currently difficult to understand the picture across sectors, the number of teachers that are registered but not teaching, and the availability of new teachers in the pipeline, particularly in

specialisations in short supply. This, together with the mobility of pre-service, early career and experienced teachers across the country, places limitations on knowing what these patterns are nationally.

Much of the data currently collected is gathered in separate collections providing discrete information about different aspects of the workforce in different parts of the country. The current ITE and teacher workforce data landscape places a brake on the capacity to achieve shared policy goals. The creation of a national ITE and teacher workforce dataset and data collection strategy offers multiple and significant benefits, including:

- a more informed dialogue between levels of government and stakeholders, based on authoritative information;
- the filling of knowledge gaps on key national and cross-sectoral issues such as the supply of specialist teachers and the employment outcomes, and impact, of ITE;
- the targeting and evaluation of teacher and school leader recruitment and development initiatives; and
- information to inform individual career choices of students, teachers and school leaders in a national teacher labour market.

A well-designed data collection and reporting strategy permits more efficient data collection and reduced respondent burden for a workforce that is already overburdened. A major weakness in current arrangements is the inability to link data across the lifecycle of teaching from ITE through early career teaching and later career teaching. To do so would provide a powerful evidence base on the outcomes of ITE and the effectiveness of policies in attracting, retaining and developing teachers and school principals.

Given Australia's national higher education system where ITE providers operate across state and territory borders, the associated mobility of students and teachers, and the national nature of the labour market for teachers, it is timely to develop a national strategy for ITE and teacher workforce data. The same imperatives to improve student outcomes through a more effective workforce have seen concerted efforts to improve collection, warehousing, linking and reporting in a range of comparable international jurisdictions. Australia's policymakers can realise the benefits of the enhanced data collection that other OECD countries have implemented. The identification and collection of suitable lifecycle data at the level of the individual ITE student, teacher and school leader will provide sound information to assist Australian governments and other key stakeholders in the development of evidence-based policies and programs in education workforce planning and enhancement.

This report sets out a **Blueprint for Initial Teacher Education and Teacher Workforce Data.**

The report is grounded in extensive consultations with stakeholders and experts, desktop research and national and international literature. The stakeholders collectively confirmed the need for improved ITE and teacher workforce data.

Stakeholders consistently identified three priority areas:

- the outcomes of ITE;
- teacher supply and demand, workforce planning and labour market information; and
- teacher and principal workforce profiling and benchmarking against other jurisdictions.

To achieve these objectives, a Data Framework was designed to identify the data that would provide a comprehensive picture of the teaching workforce across the lifecycle – from entry to ITE, graduation from ITE, registration as a teacher, employment as an early career teacher, and progress in the profession at later years.

The Framework identifies a minimum dataset for ITE and teacher workforce data, including data items, data elements and desirable data attributes. Data has been selected on the basis that it can be collected at the individual teacher level, be nationally consistent, accurate, and timely, and can offer complete coverage of the teaching population.

While the recommended data elements are drawn from existing national data collections, data gaps were identified across the ITE and teacher workforce continuum. The data currently collected in the higher education student data collection was found, by and large, to provide the required data on individuals up to and including the point of graduation from the ITE program.

Stakeholders expressed a strong desire to be able to link the Higher Education Student Data Collection (HESDC) with early teaching career data, and for a unique teacher identifier to link data at the teacher level across collections. Expert opinion was explicit about the benefits of these linkages; experts argued that this could be the single most important innovation in this national data project.

Consistent with the principles for data collection endorsed by the Australian Education, Early Childhood Development and Youth Affairs Senior Officials Committee (AEEYSOC), three approaches are recommended for improving the collection of the minimum dataset for ITE and the teacher workforce:

- the collection of administrative and survey data at the time of initial registration and at registration renewal by TRAs. Collection through this approach is expected to result in high response rates across all data items;
- a supplementary survey of ITE graduates attached to the Graduate Outcomes Survey. This survey is conducted about four months after graduation, at which point about 70% of ITE graduates seeking employment have gained it. This would provide outcome data on ITE graduates in the first year following graduation; and
- linking HESDC data (ITE data), with early career teacher data, and creating a unique teacher identifier at registration to link data across collections.

In recommending an expanded data collection role for TRAs, it is important to note that this data collection strategy does not imply that each TRA must develop a survey instrument and survey delivery platform. It is strongly suggested that this be achieved through the development of a single set of survey instruments and a single survey platform to be incorporated into regulatory authorities' existing processes and information technology environments. This approach would ensure the efficient use of regulatory authority resources. It could also facilitate the efficient collection of state- and territory-specific data.

This approach is consistent with recommendation 36 in the TEMAG report that "*Teacher regulatory authorities collect robust workforce data on a nationally consistent basis, including areas of specialisation, to inform workforce planning.*"

Additional teacher workforce data not included in the minimum ITE and teacher workforce dataset was identified by stakeholders as important for determining the effectiveness of school system policy and teacher and school leader beliefs, attitudes and intentions. A national online survey of registered teachers outside the cycle of registration renewal on a three-year cycle is recommended as an efficient way to collect this data at the national and jurisdictional level and with the required frequency and reliability. TRAs could be the point of contact with teachers, inviting their participation in a survey conducted by a suitable third party.

Similar data collection approaches have been adopted in the health professions. Since 2010, all registered health and allied individuals in 14 professions (including medical practitioners and nurses) provide administrative and survey data annually at the point of their renewal of registration. A response rate of over 90% is achieved in all professions. These data are collected by the Australian Health Practitioners Regulation Agency. They are warehoused in the form of a National Health Workforce Dataset, reported on by the Australian Institute of Health and Welfare, and are made available to the Commonwealth, State and Territory departments of health for workforce planning purposes. Supplementary surveys operate outside this cycle.

The TRAs enable all teachers to register or renew their registration. The timeframes for renewal vary: in some jurisdictions registration renewal is annual, and in others it is five yearly. While this divergence will add complexity to a data collection strategy, and will reduce the completeness of data, it will offer a starting point to compile a national

profile of ITE and the teaching workforce as outlined in the Blueprint. Legislation is required to enable TRAs to collect the proposed data, and collections might only be possible following system upgrades.

To facilitate sharing, storage, and reporting of the national ITE and teacher workforce dataset, the establishment of a business intelligence capability or data warehousing is proposed. Business intelligence capability enables the exchange of large datasets. The data collected by the TRAs could be extracted and released to the warehouse for validation, reformatting and storage. The release of data by the TRAs would require a data release protocol to be agreed, compliant with jurisdictional privacy legislation. The data warehouse would make the data available to agreed parties for agreed uses, including reporting.

Finally this report proposes a staged approach to implementation. It is recommended that a phased approach to collections is adopted with a strong program underpinned by a series of prototypes of design, test, feedback and adaptations, to ensure benefits are realised and problems are identified and remedied early. The implementation plan provides an indicative time scale for the population of the proposed data warehouse with the data identified in the Data Framework, and collected through the recommended data collection strategy. As the data in the warehouse is sourced from datasets held by multiple custodians, strong governance arrangements are vital.

The proposed staged approach could result in enhanced reporting of ITE outcomes nationally from the third implementation year onward. The states and territories contributing to the data warehouse at an early point would also be in receipt of rich, linked data on the ITE students, teachers and school leaders registered in their jurisdictions from the third year onward, including on ITE outcomes, for teacher supply and demand and for workforce profiling.

The Blueprint for ITE and teacher workforce data contains the following recommendations:

Recommendation 1: That a national ITE and teacher workforce dataset is established for priority purposes: reporting on the outcomes of ITE, modelling teacher supply and demand, and profiling the teacher workforce.

Recommendation 2: That the data architecture set out in the Data Framework is adopted for the implementation of an ITE and teacher workforce dataset, including the minimum dataset and data attributes.

Recommendation 3: That the data collection strategy for the minimum dataset for ITE and teacher workforce data involves a combination of data collected by teacher regulatory authorities and a Graduate Outcomes Survey supplementary survey of ITE graduates.

Recommendation 4: That the data collection strategy for teacher workforce data that is not part of the minimum dataset for ITE and teacher workforce is collected through a survey of registered teachers outside the cycle of registration renewal.

Recommendation 5: That a unique teacher identifier is created for the ITE and teacher workforce dataset and a statistical linkage key is implemented to link ITE student data to teacher regulatory authority teacher data at the individual level.

Recommendation 6: That arrangements for data custodianship for the ITE and teacher workforce dataset are agreed at the earliest stage of implementation.

Recommendation 7: That a phased approach to implementation of the ITE and teacher workforce dataset be adopted.

1. Purpose

In 2015, the Australian Government Department of Education and Training (the Department) in conjunction with the Australian Institute for Teaching and School Leadership (AITSL) contracted the Mitchell Institute for Health and Education Policy (The Mitchell Institute) and the Centre for International Research on Education Systems (CIRES) to develop a Blueprint for ITE and teacher workforce data. The purpose of the project was to identify the types of data that could be collected to assist planning, research and evaluation for ITE and for the teacher workforce.

The work followed the release of *Action Now: Classroom Ready Teachers* (Teacher Education Ministerial Advisory Group (TEMAG) 2014), which identified that current workforce data do not provide a clear picture of supply and demand at a national level, nor on the level of subject specialisation or school sector. It also identified that data about pre-service teachers are presently inadequate as a basis for planning for future cohorts of teachers beginning in schools.

The project had three components:

- develop a Data Framework for ITE and teacher workforce data to inform policy development and workforce planning;
- map data in the Framework to currently or previously available collections to identify data gaps; and
- develop a Blueprint for implementing the Data framework in Australia.

The Blueprint sets out a clear pathway for the efficient collection and reporting of ITE and teacher workforce data to inform policy development and the management of workforce needs, including by universities and teacher employers.

Through the data mapping component, the project examined whether the data identified in the Data Framework is availabile from ongoing collections or has been previously collected on a one-off basis. The project identified data gaps, additional data collection needs and opportunities for improved and more efficient data collection.

Simultaneously, the Mitchell Institute and CIRES were contracted by AITSL to develop an ideal data framework for ITE to assist in research and evaluation at the national level. 'Ideal' was defined as data that might be collected within the next five years. The research and interviews for the AITSL work informed the Department's project. This project extended this data framework formulated for AITSL to incorporate information on the full teacher workforce and implementation of the Framework.

This project builds on previous work undertaken to collect teaching workforce data. This includes the National Teaching Workforce Dataset (2012), Staff in Australia's Schools survey collections (2007, 2010, 2013), the Longitudinal Teacher Education and Workforce Study (2013), the Productivity Commission's Schools Workforce report (2012) and AITSL's Annual ITE data report (AITSL 2014b).

1.1. Report Structure

Section 1

Purpose: This section provides information on the outcomes sought from this project and its component parts.

Section 2

Policy Context: This section provides the policy context for the project, particularly as it relates to the outcomes of ITE and teacher supply and demand and the rationale for a national ITE and the teacher workforce dataset. It refers to parallel developments in the health professions. It provides examples of the collection and use of teacher workforce data in international contexts.

Section 3

Methodology: This section provides the methodology for the three phases of the project:

1. the development of a Data Framework that sets out the minimum dataset for ITE and the teacher workforce for policy, planning and evaluation purposes, based on stakeholder consultation and desktop research;
2. data mapping to assess the adequacy of current data collections and identify data gaps; and
3. the articulation of a Blueprint that sets out how the recommended minimum dataset for ITE and the teacher workforce could be collected, warehoused and reported to achieve desired benefits.

Section 4

The Data Framework: This section sets out the architecture for the ITE and teacher workforce data across the lifecycle phases of pre-entry to ITE, entry to ITE, progress through ITE, graduation from ITE, initial teacher registration, employment in early career teaching and later career teaching. It presents a Data Framework based on this teacher lifecycle, including a minimum dataset and data attributes.

Section 5

Data Mapping: This section provides the results of mapping the data available from ongoing and ad hoc administrative and survey collections against the data in the ITE and teacher workforce minimum dataset. It identifies data gaps and necessary data enhancements.

Section 6

Blueprint for ITE and teacher workforce data: This section identifies how the data gaps can be filled, the arguments for a unique teacher identifier, and presents data warehousing and reporting arrangements for the ITE and workforce data. It proposes phases for the establishment of a national ITE and teacher workforce dataset.

2. Policy Context

2.1. Teacher education in government policy

Teacher education has been a recent focus of policy among State, Terrritory and Commonwealth governments in Australia. In 2009, the Council of Australian Governments (COAG) commenced the National Partnership Agreement on Improving Teacher Quality. This resulted in initiatives aimed at improving the quality and availability of teacher workforce data, prompting the creation of a national teacher workforce dataset and a national longitudinal study of teacher education graduates (Dowling et al. 2009). In 2010 AITSL was formed, with a focus on standards and professional development for teachers and school leaders. AITSL identified four levels of teacher capability within the Australian teacher professional standards (AITSL 2014a). The standard for principals identified the qualities and capabilities required to enable leaders to drive school improvement. The establishment of AITSL in 2010 paved the way for improved national consistency in important elements of the development of the teaching workforce.

In 2013, the incoming Commonwealth Education Minister, the Hon Christopher Pyne MP, announced quality teaching as one of the pillars of the Government's school education policy, with a particular focus on ITE. The Minister established TEMAG, which in early 2015 published a report into ITE titled *Action Now: Classroom Ready Teachers*. *Action Now* recommended how ITE in Australia could be improved (TEMAG 2014).

The TEMAG report focused on the responsibility of ITE providers to improve the quality of new teachers and on the requirement that providers demonstrate quality by demonstrating that their graduates are classroom ready. Among the report's 38 specific recommendations, several related to the collection of data about ITE programs and graduates. Higher education providers were asked to provide measures of program effectiveness. The TEMAG report recommended that AITSL's role be expanded to provide a national focus on research into teacher education, and that Teacher Regulatory Authorities (TRAs) collect and share data to contribute to a nationally consistent workforce dataset (TEMAG 2014).

The Government's response to the TEMAG report reinforced these recommendations and the changes to AITSL's responsibilties (Australian Government Department of Education and Training 2015). AITSL is now responsible for developing a more rigorous and consistent system for accreditation of teacher education courses and supporting other improvements in ITE.

2.2. Teacher effectiveness

The broader policy debate in Australia about schooling has emphasised teacher effectiveness and teacher supply as they relate to teacher education. For more than a decade, student achievement research has shown that after student background, teachers have the biggest influence on student learning (eg. see Hattie (2003) and RAND Education (2012)). Individual teachers account for about 30% of the variance in student achievement. For this reason, improving teacher effectiveness has been seen as one of the main levers to improve education outcomes. Research has demonstrated that school leadership is next to teacher effectiveness in its impact on student learning, making it another important lever in school improvement.

State governments have used these research findings to develop a range of policies focused on improving teaching effectiveness and school leadership. New South Wales, Victoria and Queensland, for example, all highlight teacher

effectiveness in recent policy statements. New South Wales released *Great Teaching, Inspired Learning* in 2013 to document and publicise research about what practices support quality teaching (Centre for Education Statistics and Evaluation 2013). In the same year, the then Victorian government released *From New Directions to Action: World class teaching and school leadership* (Department of Education and Early Childhood Development 2013); this outlined how the department would pursue its aims to attract quality teachers, improve ITE and improve professional development in schools. The Bastow Institute of School Leadership was established to improve the capability of new and experienced principals. The importance of teaching effectiveness in the national debate is clearly reflected in national, state and territory policy documents and teacher quality has become a shared focus in governments' thinking about ITE.

2.3. Supply and demand

A sustainable supply of quality teachers and school leaders is essential to the effectiveness of the education system. The effective management of this supply is far more complex than simply matching the number of available teachers to the number of students in schools. Teacher workforce planning also involves ensuring an appropriate skills mix within the profession to provide the best possible education to all students, regardless of their year level, geographic location, curriculum choices or socio-economic status. Effective workforce planning and development involves detailed understanding of the factors affecting teacher supply and demand in Australia.

For this reason, teacher supply and demand forms an important part of the policy discussion about teacher effectiveness. The Productivity Commission (2012) investigated issues of teacher workforce policy across Australia. Issues under review included: supply of teachers into the many sub-markets such as science, technology, engineering and mathematics (STEM) and 'hard-to-staff'areas; the supply of effective teachers into the workforce; and the influence of relevant policy environments. The Commission warned that imbalances in supply and demand are "costly for both students and the wider community" (Productivity Commission 2012, p. 11). The Commission concluded that while there has been a consistent oversupply of generalist primary teachers for many years, there is a serious under-supply in certain subject areas, and in schools serving rural and low-socioeconomic-status communities. It noted that a variety of policies were in effect in states and territories, reflecting the engagement of governments with the importance of teacher supply and demand.

State governments have concurrently investigated supply and demand challenges in their own jurisdictions. The South Australian Teacher Education Taskforce (2012) investigated issues in supply and demand and created forecasts in the report *Teacher Supply and Demand in South Australia: Beyond 2010*. Similarly, the Victorian Department of Education and Training has been modelling the supply and demand of teachers over the past decade.

The principal factors affecting teacher demand identified in state, territory and Commonwealth studies are:

- the number of school-aged children, which is predicted to increase dramatically across Australia in the next decade (Weldon 2015);
- the ratio of students to teachers, which is affected by numerous factors, including class size, school size, and the number of curriculum subjects offered within a school; and
- demand for specific teaching skills, especially skills in particular curriculum areas, or in working with specific groups of students.

The number of school-aged children in Australia has been forecast to increase rapidly. However, this is not evenly distributed across states or within states. This will place pressure on having sufficient quality teachers in different locations, as well as pressure on the physical infrastructure. These demographic shifts reinforce the need to improve supply and demand planning nationally.

Factors affecting teacher supply include:

- the number and characteristics of students entering, and graduating from, ITE. While there has been strong recent growth in the numbers of students entering teacher education programs, an increasing percentage of students are reported to come from lower Australian Tertiary Admissions Rank (ATAR) bands (eg. see Weldon 2015);
- the alignment of teachers' skills and attributes with the needs of schools and communities. The finding that around one-third of secondary principals require teachers to teach "out of field" (TEMAG 2014) suggests that opportunities for teachers to upskill and reskill are important components of workforce planning;
- the identification and development of suitable candidates for school leadership positions;
- teacher retirement, which has been identified as a particular risk in subjects such as maths and physics, where the average age of teachers is the highest (Weldon 2015);
- teacher attrition and retention, including retention within the profession, and retention in particular schools or geographic areas. Difficulties in recruiting teachers to hard-to-staff schools are often compounded by high levels of teacher turnover. Teacher job satisfaction and workplace wellbeing are important underlying factors in this area;
- teacher effectiveness, or the contribution that each teacher makes in the classroom. Even if schools can recruit sufficient numbers of teachers and school leaders, supply issues arise if they are not sufficiently skilled or experienced to meet the school's needs; and
- teacher migration, both into and out of Australia.

2.4. The rationale for a national ITE and teacher workforce dataset

Initial teacher education and the teaching workforce are national concerns requiring the effective collaboration of many key stakeholders: state, territory and the comonwealth governments, along with TRAs, ITE providers, other teacher employers, schools and their leadership and individual and prospective teachers and representative bodies. In this context, the creation of a national ITE and teacher workforce dataset and data collection strategy offers multiple and significant benefits, including:

- a more informed dialogue between levels of government and stakeholders, based on authoritative information;
- a national and cross-sectoral perspective on key issues;
- the filling in of key gaps in current knowledge – for example, ITE employment outcomes and areas of supply and demand, such as the number of graduate teachers in specialist areas;
- opportunities to reduce respondent burden and improve efficiency in data collection; and
- the capacity to undertake longitudinal research and predictive modelling.

The creation and use of a national ITE and teacher workforce dataset will provide benefits at multiple levels. It will:

- at the national level, forge greater consensus regarding workforce management and development, progress on other areas of national endeavour (eg. innovative capacity and STEM) and international comparisons;
- at the state and school sector level, inform policy settings and approaches to school improvement, teacher workforce planning and dialogue between government, regulatory authorities, teacher education providers and employers;
- improve supply of teachers and school leaders at the school level and provide the basis for more informed local action;
- generate better information for potential ITE students, teachers and ITE providers for career planning and decision-making; and
- produce better information on the impact of ITE programs.

The literature reviewed for this project highlights these potential benefits in three areas: the outcomes from ITE, teacher supply and demand and broader school system policy setting that determine capacity to recruit, retain and develop the teacher and school leader workforce.

Local and international literature on ITE is extensive. It demonstrates that initiatives to improve the effectiveness of teacher preparation are central to current strategies aimed at lifting student learning outcomes in all developed economies. There is a strong focus in the literature on the management of all phases of ITE, from the selection of candidates for entry, to ITE programs, and early career teaching. Evaluations of ITE frequently extend to assessments of induction and mentoring processes for new ITE graduates in early career teaching (OECD 2015).

The TEMAG report *Action Now: Classroom Ready Teachers* (2014) provides the national context for efforts to improve ITE in Australia. The report's authors noted with concern that some current graduates from accredited ITE programs are not classroom ready. The Australian Government's response strongly endorsed the report's overall directions. The Government has outlined a comprehensive program for AITSL to work with other key stakeholders to strengthen ITE, including through:

- selection of suitable ITE students;
- ensuring the effectiveness of the practical experience component of ITE programs;
- robust and consistent assessment of graduates;
- rigorous assessment of ITE programs for accreditation; and
- quality approaches to teacher induction.

Stakeholders in this critical national undertaking are developing initiatives and investing significant resources to strengthen ITE. These processes are being coordinated by AITSL. Assessing how, why and the extent to which these strategies work is of critical importance. Effective monitoring of ITE employment outcomes and perception of program effectiveness through the collection of relevant data will provide crucial information and direction for the overall ITE improvement strategy. The collection and reporting of fit-for-purpose data on the outcomes of ITE at the individual graduate level will provide important information on:

- the proportion of graduates for whom concerns regarding classroom readiness remain;
- the relative success of individual accredited programs in producing classroom-ready teachers;
- the effects of student background, ITE program and early career teaching context on perceptions of classroom readiness;
- the success of early career mentoring in maintaining or improving teachers' perceptions of professional competence and self-efficacy, and in ameliorating attrition;
- the rate of improvement in the preparation of classroom-ready teachers at aggregate levels; and
- locations where improvement strategies have worked well or poorly as sites for further research.

The case for ITE data to have national scope is strong. Accredited ITE programs have national reach, increasingly through online delivery; Australian ITE graduates are deployed across state and territory borders in a national teacher market, and the effectiveness of teacher training is a matter of shared national concern for all stakeholders.

The Productivity Commission (2012) has warned of the significant costs to students and the wider community of mismatches between teacher supply and demand. It has cited the effects of such mismatches, including:

- worsened learning outcomes for students and school communities where teachers are in short supply, or where a lack of specialist teachers inhibits learning in curriculum priority areas like STEM or in the delivery of a broad curriculum, often affecting disadvantaged students the most;
- underutilisation of investment by graduates and governments in ITE where teacher oversupply exists, including opportunity costs for public investment;
- costs of provision of quality professional experience placements in excess of the number required to meet future teacher demand; and

- costs to government and teacher employers of labour market interventions and workforce management initiatives undertaken to correct supply and demand mismatches. The Commission identified three broad areas of interventions:

- boosting recruitment in areas of shortage through scholarships, employment incentives, fast-track ITE pathways and incentives to attract indigenous school teachers;
- increasing early career teacher retention through accelerated salary progression and mentoring; and
- financial incentives to fill hard-to-staff positions.

The efficient operation of labour markets, including the labour market for teachers, is dependent on accurate and accessible data. All teachers, school leaders and potential ITE students need usable and reliable data to make informed judgements on the elements which will affect their individual career prospects. The data required for this purpose needs to be highly granular, given the nature of the teacher labour market and its many sub-markets, including by:

- teaching specialisation, particularly specialisations in short supply;
- teacher demographics, including for individuals of indigenous background, given COAG commitments to train additional indigenous education workers; and
- school location, given the policy priority of improving outcomes for disadvantaged groups, including those in remote and rural locations and/or in low socio-economic background communities.

Governments and teacher employers seek to manage their teaching workforces and plan ahead effectively, and adequate data is central to this. Prominent amongst current concerns of governments and other teacher employers is the age profile of teachers and school leaders generally, and particularly of teachers of mathematics, physics and chemistry, which face shortages in these areas in coming years. A second concern requiring monitoring is the impact the growing proportion of ITE students undertaking graduate programs will have on supply.

Highly granular data would better equip governments and other teacher employers to target interventions and evaluate their success and the impact of policy and program interventions on overall shortages and on oversupply. The data also needs to follow the life course of ITE students, teachers and school leaders and enable the calculation of graduation, deployment and attrition rates over time to model trends and forward supply in relation to demand. The Productivity Commission (2012) concluded that there is an oversupply of primary teachers in Australia, noting that some students are likely to have enrolled in courses without a reasonable understanding of their employment prospects, and that insufficient information may have magnified current teacher surpluses.

The inadequacy of current ITE data in Australia is demonstrable. In March 2015, the NSW Department of Education recorded with concern that there were 47,000 persons seeking permanent employment as a teacher, with limited prospect of realising this aspiration (NSW CDE 2015). This concern about oversupply, particularly of primary teachers, was echoed by the NSW Board of Studies, Teaching and Educational Standards (BOSTES 2014) in its submission to the TEMAG review. BOSTES cited research suggesting that at least one third of the qualified teachers on the Department's employment list were unable to secure a permanent job and stopped looking after four or five years (McDougall 2014; see also BOSTES 2014). However, the TEMAG submission from the NSW Deans of Education was based on an opposite premise. This submission incorporated research by Preston, which indicated that there was no general oversupply of teachers in NSW, including of primary teachers (NSW CDE 2015).

A second example of the inadequacy of current data is provided by the highly variable of estimates of teacher attrition in the early career years of teaching. In 2013, the Queensland College of Teachers (QCT) investigated the proportion of beginning teachers who leave the profession within the first five years after commencing teaching in different Australian jurisdictions, and found it ranged from 8% to 50% (QCT 2013). The QCT also found that 13.5% of those granted provisional registration to teach in Queensland in recent years had removed their names from the register within four years of that initial registration.

Difficulties in the quantification and comparison of rates of attrition have been noted:

> *Accurate Australian figures are difficult to obtain because each state and territory education department gathers its own exit statistics and there is often a reticence to publicly reveal the data, in particular, concerning the number of years of service of those leaving the profession. However, a survey of 1351 beginning teachers conducted by the Australian Primary Principals Association (APPA) indicated that 24% of teachers felt it was likely they would leave teaching within 5 years. The Australian Education Union found in a survey of 1200 ECTs (Early Career Teachers) that 45% indicated that they did not believe they would still be teaching in 10 years' time.*
>
> (Buchanan et al. 2013)

More recently, the Australian Council for Education Research (ACER) (Weldon 2015) has explored supply, demand and data issues in teacher workforce planning. The ACER report identifies data imbalances similar to those highlighted by the Productivity Commission. Additionally, the ACER report concludes that while a reasonable amount is known about the existing teaching workforce, very little is known about teachers who are registered but not teaching and the future 'pipeline' of teachers entering into, and emerging from, ITE and entering schools.

ACER CEO Geoff Masters has emphasised the importance of effectively matching teacher supply to demand in Australia. Reflecting on the capacity of current data to inform workplace planning effectively, he notes "as a nation we do a poorer job than some other countries in ensuring that we prepare an appropriate number of teachers in the areas in which they are most needed." He notes further:

> *Under these circumstances, it is essential that we have excellent data for workforce planning and a good understanding of developments and trends that will shape the teacher workforce of the future. (Masters 2015)*

Alberta, Canada

Alberta has commenced implementation of a new teacher registry system, the Teacher Workforce Information System (TWIS), to serve the twin purposes of teacher regulation and the collection of "more comprehensive and accurate employment data to support workforce planning and analysis" (Alberta Education, 2015). Teachers seek registration, pay registration fees and supply personal data including their ITE program, further qualifications and First Nation status through TWIS online. All teacher employers (public, charter, separate and private) are required to input individual teacher data, including start and end data of employment, departure reasons, grades taught, contract type, salary, leave and absences. Alberta's ITE providers will provide data on graduates including areas of specialisation. The data is warehoused in TWIS, protected by Alberta's privacy laws and accessed by the Alberta Ministry of Education and school authorities in workforce planning and development. Data linkage is in the initial implementation phases.

The findings of the TEMAG report included the inadequacy of current data on ITE outcomes and current data on teacher supply and demand, and provided specific commentary and recommendations on the subject:

> There is a need for national leadership to build Australia's capability to drive strong, evidence-based practice in initial teacher education and to manage its teaching workforce. Better evidence of the effectiveness of initial teacher education in the Australian context is needed to inform innovative program design and delivery, and the continued growth of teaching as a profession. To meet the needs of Australian classrooms, providers and school systems need clear information on the composition of students in initial teacher education programs and teachers in the workforce. (TEMAG 2014)

The report recommended that TRAs collect robust, nationally consistent workforce data (Recommendation 36) and that such data be shared (Recommendation 37).

There is a pressing need for better data on ITE outcomes and for the monitoring of teacher supply and demand. In addition there is a need for data to provide insights into the broader system factors that support the capacity to recruit, retain and develop high-performing teachers and school leaders. The school teaching workforce is Australia's largest professional group. There are over 400,000 registered school teachers nationally (Aust Govt. 2014), with an additional 18,000 (approx.) new teaching graduates each year from over 400 ITE programs nationally (AITSL 2015). Governments at all levels, other agencies, and individuals make significant investments in this workforce.

Adequate data provides policymakers with important information and insights about the organisation of schooling, about its teacher and leader workforce, and about ways to improve workforce management (including through benchmarking against domestic and international jurisdictions). Policy development and adjustment require the ongoing monitoring of key elements of Australian schooling systems such as:

- teacher and leader working environments, for example salary and working conditions;
- opportunities for, and effectiveness of, professional development;
- teacher and leader appraisal and feedback arrangements, and the impact of these on performance;
- the pedagogical skills of teachers and the leadership skills of principals; and
- the relationship of these skills to professional competence, job-satisfaction and self-efficacy.

A clear need for this type of broader systemic data on the teaching workforce has previously resulted in ad hoc data collections: the conduct of the Staff in Australia's Schools Survey (SiAS) in 2007, 2010 and 2013 and Australia's participation in the OECD's Teachers and Learning International Study (TALIS), most recently in 2013. Whilst these data are valuable, unlike data on ITE outcomes and for teacher supply and demand, adequate information for population estimates is available by surveying a sample of teachers and school leaders every few years.

The same imperative for broader systemic data is observable in countries comparable to Australia, including Germany, Canada and the United States. Strategies to improve the extent and quality of ITE and teacher workforce data collection are under development or in operation in each of these federal jurisdictions abroad. There is an intensified drive to gauge outcomes from ITE and to address teacher supply and demand concerns. The methods in the three countries differ but the intent of each is similar. Each country seeks to strengthen administrative data collection, use smarter teacher survey strategies, and to introduce data linkage capacity to enable more powerful analysis of previously discrete datasets. Additional information in these countries is provided in Appendix 4.

Australia's policymakers can realise the benefits of enhanced data collection, as other OECD countries are doing. The identification and collection of suitable life course data at the level of the individual ITE student and teacher will provide sound information to assist Australian governments and other key stakeholders in the development of evidence-based policies and programs in education workforce planning and enhancement.

Section 4 of the report identifies the data whose collection and reporting would fulfil this purpose. Section 5 of the report sets out that, while there are large sets of data on ITE and the teaching workforce, there are currently limitations on what we know about the outcomes of ITE programs and about workforce supply and demand at a national level. Much of the data is gathered in separate collections, providing discrete information about different aspects of the workforce, in different parts of the country. Capacity to link datasets is constrained. Section 6 of the report identifies how such limitations could be addressed and articulates a Blueprint for the introduction of a suitable data collection strategy and the establishment of a national ITE and teacher workforce dataset.

Kentucky, USA

Under federal law all states report ITE data to the federal government, including on:

- the number of teaching graduates by academic major and teaching specialisation;
- the extent to which ITE graduate numbers are addressing any shortage of qualified teachers;
- the reliability and validity of ITE credential assessments; and
- the criteria for identifying low-performing ITE programs, a list such ITE programs and the corrective actions being taken.

The federal government makes this data available online state by state.

The state of Kentucky discharges and exceeds these federal obligations. In 2012 Kentucky established the Center for Education and Workforce Statistics. Data from various agencies are collected and matched in this data warehouse, including from the Education Professional Standards Board (regulatory authority), the Council of Post- Secondary Education (encompassing ITE providers) and the Department of Education (teacher employer). The Center's website states that whilst agencies collect data within the limit of their responsibilities, connecting data can mean that policy makers will be able to "address the strengths and weaknesses of the educational pipeline and our programs like never before' (KCEW, 2015).

Reporting in relation to ITE includes data from all Kentucky's ITE providers including enrolments, rates of retention, whether graduates were employed in-state or outside, their school district and time taken to achieve employment.

2.5. National Health Workforce Data

A set of concerns paralleling those outlined above arose in the health professions in Australia and resulted in the implementation in 2010 of the National Health Workforce Dataset (NHWD). Through the agency of the Australian Health Practitioner Regulation Agency (AHPRA), comprehensive data is collected on practitioners in 14 health professions, including medical practitioners and nurses.

These data are collected at the time of annual registration renewal. Administrative data are collected for registration purposes and data on employment, qualification, attitudes to the profession and forward work intentions are collected via voluntary survey. These data are warehoused and maintained by the Australian Institute for Health and Welfare (AIHW). The NHWD includes a unique practitioner identifier to allow individual practitioners' data to be matched and tracked over time. This approach to data collection has been adopted as a way to efficiently collect data on professionals employed in organisations varying significantly in size, complexity and purpose, and by many different employers.

The NHWD data is used by state, territory and commonwealth health departments and health regulatory bodies for regulation, reporting and workforce planning. Until its closure in late 2014, Health Workforce Australia produced regular publications on the Australian health workforces to guide workforce planning and provide insights into areas of policy concern.

Recommendation 1: That a national ITE and teacher workforce dataset is established for priority purposes including: reporting on the outcomes of ITE, modelling teacher supply and demand and profiling the teacher workforce.

3. Methodology

The research was undertaken in three phases, the first two concurrently. It was overseen by a steering committee comprising senior Department and AITSL officers and conducted in close consultation with the two organisations.

3.1. Phase 1: Stakeholder consultations and desktop research – development of the Data Framework

Targeted interviews were held with key experts and stakeholders nominated by the Department and AITSL to confirm the priority purposes for data collection and identify the data items needed for these purposes. Interviews also identified issues around data collection, access and reporting.

Forty-two individual interviews were conducted with stakeholders and experts to inform the development of the Data Framework for ITE and the teacher workforce. Interviewees represented employer bodies, TRAs and course accreditation bodies, ITE providers, school representative bodies, and university representative bodies, and included teacher education and data and information experts. These interviews also informed the development of the ideal data framework for ITE.

The Mitchell Institute and CIRES worked in collaboration with AITSL and the Department to develop an interview schedule and questions informed by the issues canvassed in an initial workshop with AITSL officers and refined based on early interviews and desktop research. Where possible, interviews were conducted face to face; Skype and phone options were made available to stakeholders when this could not be arranged.

Interviews sought the perspective of organisations on the current availability and quality of data on teacher supply and demand and workforce profiling; the purposes for which these data are currently used; and the purposes for which they could be used, if quality and access were improved. This ensured that the Data Framework being developed was underpinned by the practical data needs of stakeholders.

All interviews were recorded (if participants agreed). Recordings and notes were collated and analysed to inform the development of the Framework. The full list of interviews requested and conducted is in Appendix 1 and the interview schedule is in Appendix 2. An analysis of stakeholder consultations is in Appendix 3.

Concurrently, the Mitchell Institute and CIRES conducted desktop research to understand current literature on ITE and the teacher workforce data collection and use. The local and international literature was reviewed, in addition to approaches to workforce data collection in the health profession. Those interviewed were asked for reports they had produced on these topics. This research, along with the stakeholder consultations, informed the development of the Data Framework. The review of international literature is in Appendix 4 and on the health profession is in Appendix 5.

These sources were used to document priority purposes for the collection of ITE and teacher workforce data and the data needed to support them. These data are set out in the Data Framework.

The key findings from the stakeholder consultations were presented to Australian Education, Early Childhood Development and Youth Affairs Senior Officials Committee (AEEYSOC)'s Data Strategy Group, which provided feedback that was used to refine the Data Framework. The segments of the draft Framework relating to ITE were subsequently

presented to AITSL's Teacher Education Expert Standing Committee (TEESC), which provided feedback to further refine the Data Framework.

3.2. Phase 2: Data mapping

Data mapping was undertaken to determine whether the data items specified in the Data Framework:

- are already suitably collected through current ongoing or ad hoc administrative or survey collections, or
- require a new or refined approach to data collection.

The data mapping resulted in the finding that the current higher education student data collection provides suitable data on ITE up to the point for student graduation but that beyond that point in the teacher 'life cycle' new and refined approaches are required.

During this phase, the consultants engaged with relevant researchers and a range of data custodians to canvas feasibility, fit for purpose, and sensitivities associated with different datasets.

3.3. Phase 3: Blueprint

The development of the Blueprint brought together findings of the first two phases to:

- identify how data gaps could be addressed through new or enhanced ongoing administrative and survey collections, and
- propose a phased approach to implementing the collection, extraction, warehousing and reporting of robust ITE and workforce data.

This work was informed by the principles for data collection and use endorsed by AEEYSOC and provided by the Department for this project:

- data collection should be integrated into existing collection mechanisms where possible and at a minimal additional cost;
- data should be collected once and used many times;
- data should be reported and made available in a timely manner to ensure it is current and relevant;
- data should be clearly reported so that it is meaningful and appropriate levels of access to data should be established for particular users ;
- personal data should be properly protected;
- national datasets should be collectively owned through the COAG Education Council;
- synergies between related collections and activities should be realised through streamlined governance arrangements; and
- the expertise of existing organisations should be used for collecting, compiling and reporting the data, where possible.

The Blueprint aims to balance the data needs of stakeholders against efficient adaptation of existing approaches to, and exploitation of opportunities for, data collection.

The Blueprint proposes options for stakeholder roles in relation to data collection, and suitable warehousing arrangements for the data, based on stakeholder consultations. The options take a cost-minimisation approach to data collection, while aiming to move Australia closer to best practice in evidence-based teacher workforce planning and development.

A further discussion was held with members of the Australian Teacher Regulatory Authorities (ATRA) at their meeting in early October to further explore possible data collection roles they might play.

4. The Data Framework

This section of the report identifies the architecture for ITE and teacher workforce data to be collected on an ongoing basis for policy, planning and evaluation purposes. This proposed architecture derives from stakeholder consultations and desktop research, and is informed by the ideal data framework for ITE commissioned by AITSL. The data are presented in the form of the Data Framework.

A key observation to emerge from the stakeholder consultations undertaken for this project was that the Data Framework should be tightly focused on those data required for high-priority purposes. Three broad priority purposes for the collection of ITE and workforce data were consistently confirmed by stakeholders:

- evaluating the outcomes of ITE;
- teacher supply and demand modelling for workforce planning and market information; and
- teacher workforce profiling for benchmarking against local and international jurisdictions.

These three priority purposes for the collection, analysis and reporting of teaching data are prominent in the literature examined for this project as well as in stakeholder contributions. These purposes were adopted as the high-level criteria for including data in the Framework. The data items required for each of these purposes are identified separately in Sections 4.1 to 4.4.

There was also a strong consensus among those consulted that only data central to these purposes should be included in the Framework. This measure would help justify the cost of collection of existing and new data items proposed for collection and ensure that the burden on those asked to provide the data is minimised. This sentiment is consistent with the criterion for data collection endorsed by AEEYSOC that data should be "collected once and used many times."

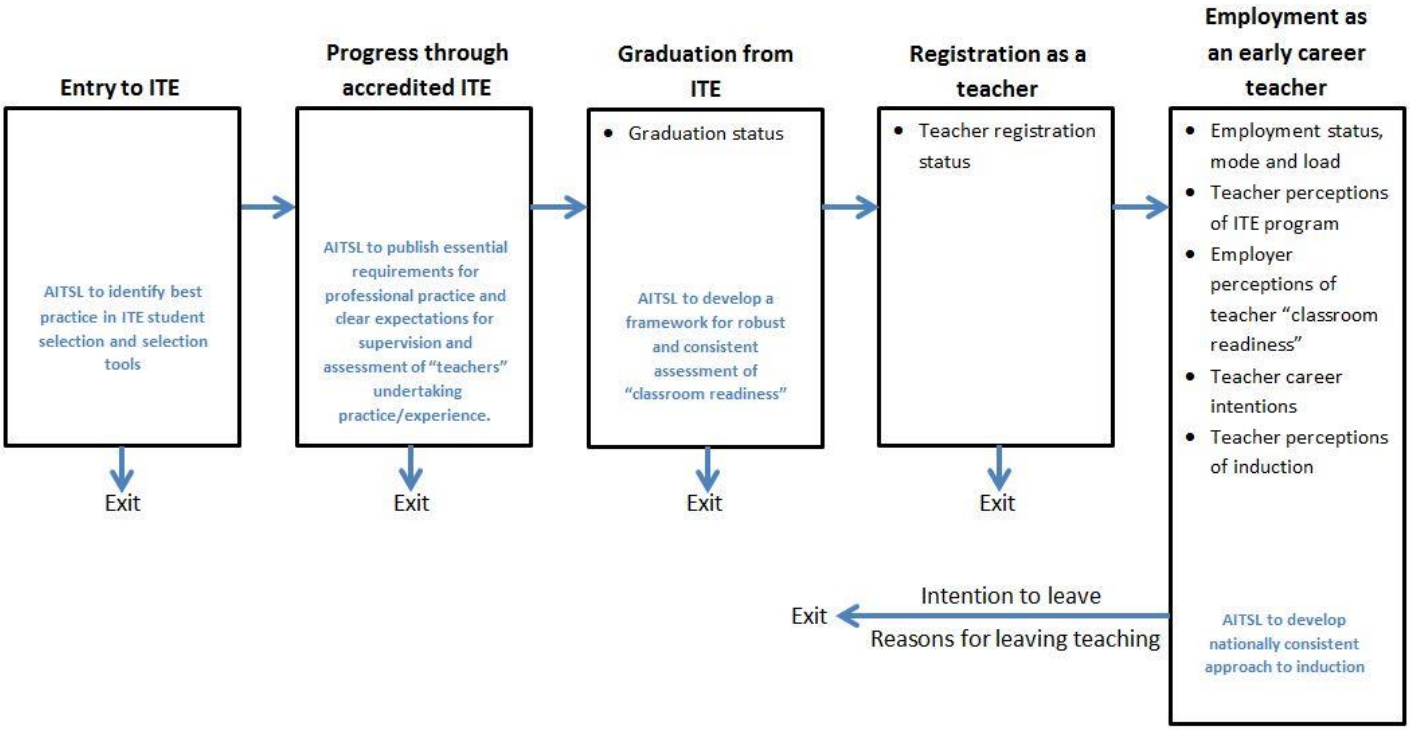
4.1. Data on the outcomes of ITE

In section 2 of this report, Policy Context, the program of work being coordinated by AITSL at the national level to strengthen ITE is summarised. These initiatives are intended to have a cumulative impact on new graduates from ITE programs as they enter and progress through early career teaching. To guide and report on their implementation, ITE providers, experts in the field, and education department officials have proposed or endorsed the need for improved and consistent collection of data to answer the following sequence of questions as proxies for graduates' classroom readiness:

- How many students graduate and are assessed by the ITE provider as "classroom ready"?
- How many graduates choose to register as a teacher as a requisite step towards employment as a teacher?
- Early career teaching:
    - How many graduates gain employment as teachers; how long does it take; on what basis are they employed?
    - do early career teachers perceive their ITE program to have been helpful in achieving the Australian Professional Standards for Teachers (APST) at graduate career stage?
    - What proportion of employers perceive early career teachers as classroom ready?
    - do early career teachers perceive their induction into teaching as being helpful?
    - do the early career teachers intend to remain in teaching; and if not why?

The data on the outcomes of ITE, along with summary information on the program of work being coordinated by AITSL, are illustrated in Figure 1 below. The data are proposed to be collected at the individual teacher level and in a manner that facilitates the linking of data items to enable analysis at the required level of detail.

Figure 1: Data on the outcomes of ITE



Over 400 accredited ITE programs are currently offered in Australia. There is an expectation that students who are selected for and participate in programs will be classroom ready when they graduate into the early teaching phase of their career. The proposed data collection aims to provide ITE outcome information at the program level. Data on the accredited ITE program undertaken by the individual teacher is required for this analysis. High response rates in the collection of the proposed data will also be required to maximise statistical confidence in the results.

Stakeholders indicated that data analysis on the outcomes of ITE also requires data on the specific employment situation of individual teachers. This level of detail is needed to provide insights into the range of contextual factors that will affect the outcomes of new graduates as they start teaching, including:

- the school/s and labour market in which the teacher employed or seeking employment;
- whether the teacher is teaching in subjects related to their teaching specialiations;
- to what extent the teacher is engaged in face-to-face teaching as opposed to other duties; and
- to what extent the teacher is given opportunities for professional development.

The minimum dataset (set of core data items) required for the outcomes of ITE programs is set out in Table 1 below, along with the data item numbers used to identify them in the Data Framework in section 4.5. It is proposed that the data (ideally) be collected annually to capture a new cohort of ITE graduates each year, with employment-related data on new graduates collected annually for the first three years following graduation.

Table 1: Minimum dataset: outcomes of ITE

Data item	Data Framework item number
Accredited ITE program	8
Subjects studied at tertiary level	11
Qualification – level, field, year	12
Teaching specialisations	13
Teacher registration status	19
Teacher employment status	20
Teaching load	21
Current school, classification and salary	22
Teacher perception of helpfulness of ITE program	23
Employer perceptions of classroom readiness	24
Teacher perceptions of helpfulness of induction	25
Teaching and non-teaching duties	26
Subjects and year level taught	27
Teacher career intentions: intention to remain or leave teaching	29
Factors affecting intention to leave teaching prior to retirement	30
Unique teacher identifier	31

An accredited ITE program may operate – and the teachers graduating from it may work – in more than one state or territory. The data to gauge the outcomes of ITE programs therefore needs to be nationally consistent to provide a full picture of graduate outcomes. The proposed data attributes for the minimum dataset for the outcomes of ITE are:

- individual teacher level data
- data items able to be linked to the individual
- national data specification
- consistent national data collection
- accurate data
- timely data
- collected annually for the first three years of teaching
- complete data – data on all data items from all ITE graduates.

Stakeholders were also keen to be able to relate an individual's ITE outcomes to data collected during their time as an ITE student, including:

- ITE application data (Data Framework items i and ii);
- the background characteristics of the teacher during their period as an ITE student (Data Framework items 1 to 4);
- features of the ITE course the teacher graduated from (Data Framework items 6 to 10); and
- the graduate's experience of the course (Data Framework item 14).

Amongst other insights, these data can provide information on the success of the ITE program in working with different student cohorts. Relevant data are collected through the Higher Education Student Data Collection (HESDC) and held in the Higher Education Information Management System (HEIMS). To enable the desired analyses, these higher education data need to be linked to the data on the outcomes of ITE at the individual pre-service student and teacher level. A suitable data link will be required to connect the HESDC to the proposed ITE datasets.

The minimum data for ITE is set out in the Data Framework in Section 4.5. Data items are shown as numbered above. Relevant data from the HESDC are shown in the Framework in summary form.

4.2. Data for teacher supply and demand modelling, workforce planning and labour market information

Teacher supply and demand modelling and workforce planning are priority activities for most state and territory education departments. The review of literature undertaken for this project confirmed that teacher supply and demand modelling is equally a priority activity in international jurisdictions.

Supply and demand modelling can be summarised as:

- the forward estimation of demand for teachers based on forward estimates of student population and policy settings such as student–teacher ratios and class sizes and provision of a broad curriculum; and
- forward estimates of teacher supply, based on the pipeline of ITE graduates coupled with the rate of graduate deployment into teaching positions, minus exits from teaching, with adjustment for the movement in and out of the pool of registered but inactive teachers. Information derived from such modelling supports informed workforce planning and the framing of policy interventions to pursue equilibrium between demand and supply.

A high-level, generic representation of supply and demand modelling is provided in Figure 2 below.

In practice the modelling of teacher supply is undertaken at more dissaggregated levels, owing to considerations including:

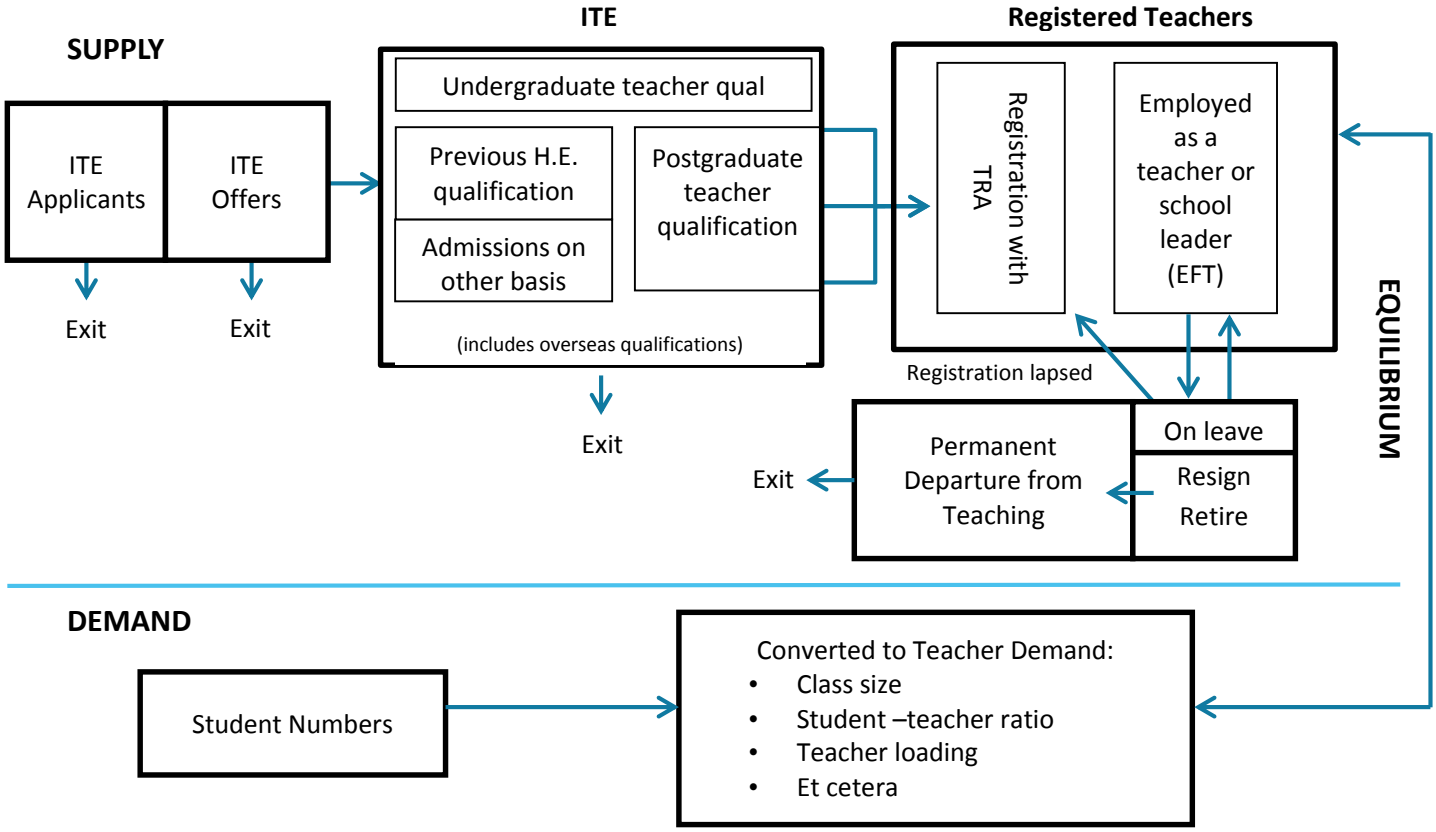
- the need for specialist teachers;
- the need to identify and develop school leaders; and
- deployment of teachers across geographic areas, including into hard-to-staff schools and regions.

This modelling is primarily undertaken by education departments, with other stakeholders expressing a keen interest in the results. For example, the More Aboriginal and Torres Straites Islander Teachers Initiative (MATSITI) representatives sought greater detail and anaylsis of the supply chain of new Aboriginal and Torres Strait Islander (ATSI) teachers and factors relating to retention within the teaching workforce. ITE provider spokespersons also expressed the view that better data on ITE graduate employment prospects should be available to current and prospective ITE students to inform career aspiration. The availability of authoritative information on the teacher labour market was recognised as critical to investment decisions by government, teacher employers and individuals alike.

States and territories have developed their own approaches to teacher supply and demand modelling, utilising existing departmental admistrative data. Departments reported investing considerable effort and expense in ongoing improvement to the administrative data they hold on teachers and other employees. As a result, departmental officials reported that they were currently relatively comfortable with the data they hold on teachers employed in government schools in their particular jurisdiction. Inevitably, jurisdiction-specific data and data environments are fluid and closely related to the policy and employment roles they play.

Education departments recognised that the capacity to undertake useful teacher supply and demand modelling requires information outside the scope of their administrative collection. There consensus among departmental officials, particularly from experts and in the literature as to the priority information needs.

Figure 2: Teacher supply and demand conceptual framework



Adapted from: *Staff in Australia's schools,* Owen et al. (2008)

4.2.1 The information gaps

The information gaps in the ITE graduate, initial teacher registration and early career employment phases are:

- the supply of new ITE graduates disaggregated by:
  - teacher specialisation
  - demographic characteristics, particularly Aboriginal and Torres Strait Islander status
- the proportion of ITE graduates who register as teachers;
- the number of overseas qualified teachers registering to teach locally;
- patterns of deployment of newly registered teachers into schools and the nature of their employment, including:
  - schooling sectors (government, Catholic, independent) and levels (pre-school, primary, secondary)
  - school location, in regard to remote and hard-to-staff schools
  - school location, where the teacher is employed in a different state or territory than that in which their ITE provider is located. This is particularly germane to the rise in online ITE enrolments
- attrition of teachers by specialisation.

The information gaps in the later career employment phase are:

- attrition of teachers by specialisation;
- actual levels of teacher retention and teacher attrition: this gap means that departures from one school, sector or state are not identified as attrition if the teacher commenced teaching in another sector or state;
- trends in casualisation of the teaching workforce and the use of casual relief teachers; and
- the size and intentions of the potential teaching workforce – that is, numbers of registered teachers not currently teaching.

The minimum dataset, that is, the set of core data items, needed to fill these information gaps for teacher supply and demand is provided in Table 2 below, along with the data item numbers used to identify them in the Data Framework in section 4.5.

The data items to fill data gaps for teacher supply and demand modelling are set out in the Data Framework in section 4.5. A variety of stakeholders volunteered a strong preference for the annual collection of data on new teaching graduates and early career teachers. In their view the data on later career teachers should be collected every three years, producing a detailed and reliable profile of the broader teaching workforce.

Table 2: Minimum dataset: teacher supply and demand modelling

Data item	Data Framework item number
ITE Provider name, campus and location	6
Subjects studied at tertiary level	11
Teacher specialisations	13
Teacher demographics	15
Post ITE qualification (level, field, year)	16
Registration conferral year	17
Registration status	18
Teacher employment status	20
Teaching load – time fraction	21
Current school, classification, salary	22
Subjects and year level taught	27
Professional development	28
Intention to remain or leave teaching pre-retirement	29
Factors affecting intention to leave teaching pre-retirement	30
Unique teacher identifier	31

Nationally consistent data is needed on the outcomes of ITE. Congruent data is also required for teacher supply and demand modelling with the capacity to provide information on the movement of ITE students and teachers between states and territories. The importance of reliable data on this aspect of teacher supply was emphasised in consultations. Interviewees cited the following instances in which more detailed data is required:

- the significant proportion of Northern Territory teachers undertaking ITE or transfering from interstate;
- the significant proportion of Tasmanian ITE graduates or teachers moving interstate for work;
- the increasing number of ITE students at South Australian and Western Australian ITE providers who are residents of other states and unavailable for work in SA or WA;
- the marked differences in trends in applications for ITE places in Queensland, compared to other states and territories; and
- the effect of the end of the mining boom on overseas-trained teacher numbers as an example of the effect of the ecomonic conditions in Australia versus other countries on teacher migration.

It is proposed that data be collected at the individual ITE student and teacher level and in a manner to facilitate the linking of data items to model stock and flows at the dissaggregated level. To obtain information on the pipeline of ITE graduates who will become available for registration and deployment as teachers, data from HESDC are used to varying extents in departments' models. This data is included in the Data Framework at the summary level (data items i and ii and 1 to 14).

The data attributes for the minimum dataset for teacher supply and demand are identical to those for ITE:

- individual teacher level data;
- data items able to be linked to the individual;
- national data specification;
- consistent national data collection;
- accurate data;
- timely data;
- collected annually for the first three years of teaching; and
- complete data – data on all data item from all ITE graduates.

4.3. Data for teacher workforce profiling and benchmarking

During consultations for the project a range of stakeholders, including departments, other teacher employers and teacher registration authorities, indicated that they currently engage in teacher workforce profiling and benchmarking aspects of their workforces (eg. age and gender profile and system policy settings) against those of other employers and jurisdictions. These data provide insights into the broader system factors that support the capacity to recruit, retain and develop high performing teachers and school leaders. The data sought through the SiAS survey was characterised by most as useful or very useful for this purpose.

The commentary on SiAS was expected, as the survey was designed with this purpose in mind. The governance arrangements for the survey have ensured stakeholders' advice determines the information sought in the survey questionnaire. The stakeholder view is consistent with the observation in the recent ACER report that we know a lot about the existing teacher workforce (Weldon 2015).

The SiAS gathers a wide range of information on individual teacher and school leaders, including:

- demographics;
- qualifications and tertiary study;
- current position and work, including school leadership positions;
- professional learning;
- career paths in teaching and future career intentions;
- activities outside teaching; and
- more targeted information from early career teachers and school leaders.

School level information is also collected including on staffing needs. The list of data items collected in the 2013 SiAS survey can be found at Appendix 6. The SiAS survey was conducted in 2007, 2010 and 2013.

Those consulted for this project nominated a range of data items from SiAS of particular interest to them for teacher workforce and system profiling, including both teacher and school leader information. One area often emphasised was the increased focus professional development for experienced teachers and school leaders. In relation to this professional development, both the Australian Professional Standards for Teachers and for Principals were described as helpful for categorising the activity and targetting effort.

However, respondents from different sectors were not able to comment on the full list of data of interest to all stakeholders. The profiling data of fundamental interest to skakeholders has probably shifted since the 2013 SiAS wave,

as the implementation of initiatives continues to improve the effectivenss of teachers and school leaders, including through the ongoing implementation of the APST and Australian Professional Standards for Principals (APSP).

The data items collected in the 2013 SiAS survey should be reviewed to determine whether any items should be included in the minimum dataset for ITE and the teacher workforce. For the current project, two data items in the NTWD and the 2013 SiAS survey were included in the minimum dataset for ITE and the teacher workforce:

- 'teaching restrictions' recorded by the TRA; and
- year started with employer.

Other data from SiAS was not included in the minimum dataset for ITE and the teacher workforce. The review of data items collected in 2013 SiAS would determine the data to be collected in future collections of this type.

Whilst the data items sought through the SiAS were generally supported by stakeholders, the data available through the survey was described by stakeholders in smaller states and territories as not providing reliable population estimates. This matter is taken up in section 5. The provision of broader teacher workforce data every three years with a sampling design to provide population estimates of reasonable reliability in all states and territories was generally seen as reasonable.

4.4. The effectiveness of the broader teaching workforce and school leaders

Data on the effectiveness of the broader teaching workforce are not included in the Data Framework. Stakeholders consulted for this project agreed that the data available now, or likely to be available in the foreseeable future, did not justify inclusion. While all teacher employers are pursuing improvements in the effectiveness of their teaching workforces, these efforts are resulting in employer-specific and divergent approaches, including teacher classifications. There was a general view among education experts consulted for the project that existing proxies of teacher effectiveness, such as years of experience and highest teaching qualification, were unsuitable for the purposes of this Data Framework model.

Some stakeholders observed that meaningful data could result from the adoption of the APST by all employers as the basis for classisfication of the effectiveness of all teachers, if classification was undertaken on a valid and reliable basis. A consistent national process for certification of highly accomplished and lead teachers has been developed and endorsed by Ministers. However, it has only been implemented in some jurisdictions and numbers of certified teachers are low at this early stage. In this situation, stakeholders did not see this process as likely to produce sufficient data in the near future, nor did all stakeholders think it desirable to rely on this data.

Data to evaluate the effectiveness of teachers in school leadership positions such as principals and deputy principals was not proposed for collection by stakeholders for similar reasons. AITSL have produced the APSP, which identify leadership requirements and capabilities, but do not identify levels of capability against which school leaders could be classified and data collected for this purpose.

4.5. The Data Framework

Section 4 of the report confirms the priority purposes for the collection and use of ITE and workforce data. It identifies the minimum datasets for these purposes. Table 3 sets out this information in the form of a Data Framework of data items according to the phases of the teacher life cycle. Based on advice received in an initial workshop with AITSL officers and early stakeholder consultations, the data in the Framework have been organised around the phases of an individual teacher's progression through the teaching life cycle:

- pre-entry to ITE;
- entry to ITE;
- progress through ITE;
- graduation from ITE;

- teacher registration;
- early career teaching;
- later career teaching; and
- school leadership.

The data items are either individual data elements or composites of data elements. This approach has been tested and adopted at the request of stakeholders interviewed to “keep the Framework readable.” Information on the teacher workforce data elements in the Data Framework is provided in Appendix 10.

.

Recommendation 2: That the data architecture set out in the Data Framework is adopted for the implementation of an ITE and teacher workforce dataset, including the minimum dataset and data attributes.

In the following Data Mapping section, the adequacy of current data collections is examined to see if data in the Framework is already adequately defined and collected in ongoing or existing ad hoc collections. The numbering of the data items in the Framework is carried over into the data mapping table to assist cross referencing.

Table 3: Framework for Initial Teacher Education and the Teacher Workforce Data

Pre-entry to ITE Phase	Initial Teacher Education Phase			Qualified and Registered Teacher Phase			
	Entry to ITE	Progress through ITE	Completion of ITE	Early Career Teacher		Later Career Teacher	School Leader
[data from HESDC]	[data from HESDC]	[data from HESDC]	[data from HESDC]	1st Year	2nd and 3rd Year		
Applicant information	**Student information (each student record linked to multiple program records)**			**Teacher information (each teacher record may be linked to multiple employment records)**			
	1. Demographic information	✓	✓	15. Teacher demographic information	✓	✓	✓
	2. Prior academic achievement				✓	✓	✓
	3. Basis of admission			16. Post ITE Quals (level, field, year)			
	4. Australian Tertiary Admission Rank			**Registration Information (including overseas qualified teachers)**			
✓	5. Unique student identifier (CHESSN)	✓	✓	17. Registration conferral year	✓	✓	✓
				18. Registration status	✓	✓	✓
				19. Registration restrictions	✓	✓	✓
Applications and offers information	**ITE program information (updated annually until completion)**			**Employment information**			
Application information	6. Provider name, campus and location	11. Subjects studied at tertiary level	12. Teaching qualification (level, field, year)	20.Employment status (ongoing, fixed term, casual)	✓	✓	✓
i. Preference ordinal number	7.Program field and level		13. Teaching specialisation/s	21. Teaching load (FTE)	✓	✓	✓
Offer information	8. Accredited ITE program		14. Course satisfaction	22. Current school, classification including school leadership, salary, year commenced at school	✓	✓	✓
ii. Preference ordinal number	9. Attendance mode and type			**Teaching information**			
	10.Student status (domestic/not domestic, govt. supported place or not)			23. Teacher perception of helpfulness of ITE program	✓		
				24. Employer perceptions of teacher classroom readiness	✓	✓	✓
				25. Teacher perceptions of helpfulness of induction	✓		
				26. Nature of current position: teaching and non-teaching duties	✓	✓	✓
				27. Subjects and year level taught	✓	✓	✓
				28. Professional development	✓	✓	✓
				29.Teacher career intentions: intention to remain or leave teaching	✓	✓	✓
				30. Factors affecting intention to leave teaching pre-retirement	✓	✓	✓
	31. Statistical linkage key / Unique teacher identifier (data linkage)						

5. Data Mapping

This section of the report describes data mapping undertaken to determine whether the data items specified in the Data Framework in the preceding section are:

- already suitably collected through current or ad hoc administrative or survey collections, or
- need to be the subject of new or refined data collection.

The data collections used in this analysis were as follows. Summary information on each of these collections is provided in Appendix 7:

- the HESDC (data held in HEIMS), Graduate Outcomes Survey (GOS) and Employer Satisfaction Survey (ESS);
- data collections of the TRAs;
- teacher employer administrative data collections;
- the SiAS survey;
- TALIS; and
- the Schools Australia collection.1

To perform this mapping, the data from the above collections was analysed to see if they have the data attributes common to the minimum datasets in the Data Framework. They are as follows:

- individual teacher-level data;
- data items able to be linked to the individual;
- national data specification;
- consistent national data collection;
- accurate data;
- timely data;
- data collected with desired frequency; and
- data with desired level of completeness.

Table 4 below provides the results of this analysis. The table provides the analysis results for those collections with threshold attributes of national (or state) data specification and consistent national data collection. The table in Appendix 10 provides further detail on the teacher workforce data items in the Data Framework at the level of individual data elements.

ITE data in the Data Framework up to and including the point of graduation are almost completely available from the HESDC or GOS. Data derived from these collections have, in the view of most of those interviewed, all the desired data attributes. The missing data items are[2] the accredited ITE program in which the student enrols and may graduate, the ITE graduate's subjects studied at tertiary level, and an ITE graduate's teaching specialisations.

The data items from the Data Framework's lifecycle phases post-graduation (at initial registration, during the early career years and during the later career years) lack one or more of the required attributes as currently collected.

[1] The data in the National Teacher Workforce Dataset is derived from these sources and therefore not separately listed.

[2] One jurisdiction stated that, were the data from the HESDC available in a timelier manner, supply and demand modelling and workforce planning in that state would be considerably strengthened.

Data sourced from TRAs is not nationally consistent. As state-based bodies, TRAs have divergent approaches to what data they collect, its specification and approaches to its collection. All assign a teacher registration number and record teacher registration status. A core set of demographic data elements are collected by all TRAs: name, date of birth and gender.

Data from employer administrative collections are not specified in a nationally consistent way or collected on a nationally consistent basis. The NTWD sources the majority of its data from TRAs and teacher employers; this data displays the same limitations described above.

Data from SiAS are specified in a nationally consistent way and collected on a nationally consistent basis and at the individual teacher level. However, the data cannot be linked to data outside the survey and is not collected from all registered teachers or with sufficient response rates to provide reliable population estimates.

Data from TALIS provides the basis for international comparisons of the learning environment and the working conditions of early secondary teachers. It provides information on teacher characteristics, working environments, leadership, learning and development opportunities, appraisal and feedback, pedagogical practices and beliefs, self-efficacy and job satisfaction. Whilst TALIS data is nationally consistent in its specification and collection, the survey sample is designed to provide reliable results at the national but not at the state level. The teacher cohort in scope is early secondary and the data collected do not therefore fully reflect domestic interests.

The Australian Bureau of Statistics (ABS) *Schools, Australia* data collection collects data annually as at a point in time on students and teachers in Australian schools. This data is collected at the school level, not the individual teacher level.

This section of the report identifies the extent to which the data items in the Data Framework are currently captured in ongoing or ad hoc collections, and whether these data items as collected have the required attributes. The current ITE student data collected by the HESDC and held in HEIMS has the data attributes required. The data for teachers from the time of initial registration through early career and later employment do not, and need to be the subject of new or refined data collection.

The two data collections with national specification for data and nationally consistent data collection, the HESDC and SiAS, provide data definitions suitable for most of the data items in the Data Framework except for the four items specifically noted in Table 4. Additional information on teacher workforce data items is provided in Appendix 10.

The next section of the report proposes options to address the data gaps and limitations identified above. It identifies suitable arrangements for data sharing, warehousing and reporting.

Table 4: Data Mapping

Data phase	Ref #	Data Item	Nationally or consistent specif. (collection)	Individual level data	Linkable data	Nationally consistent collection	Desired collection frequency	Desired completeness
Pre-Initial Teacher Education								
Preference and offer information	I	Applicant preference ordinal number	Y (HESDC)	Y	Y	Y	Y	Y
	ii	Offer preference ordinal number	Y (HESDC)	Y	Y	Y	Y	Y
Initial Teacher Education								
Student information	1	Demographic information	Y (HESDC)	Y	Y	Y	Y	Y
	2	Prior academic achievement	Y(HESDC)	Y	Y	Y	Y	Y
	3	Basis of admission	Y (HESDC)	Y	Y	Y	Y	Y
	4	ATAR	Y (HESDC)	Y	Y	Y	Y	Y
	5	Unique student identifier	Y (HESDC)	Y	Y	Y	Y	Y
Program information	6	Provider details	Y (HESDC)	Y	Y	Y	Y	Y
	7	Program (field, level)	Y(HESDC)	Y	Y	Y	Y	Y
	8	Accredited ITE program	Y (AITSL) (1)	N	N	N	N	N
	9	Attendance mode and type	Y (HESDC)	Y	Y	Y	Y	Y
	10	Student status (domestic/not domestic, Govt. supported/ not supported)	Y (HESDC)	Y	Y	Y	Y	Y
	11	Subjects studied at tertiary level	Y (SiAS)	Y	N	Y	N	N
	12	Qualification/s (field, level, year)	Y (HESDC)	Y	Y	Y	Y	Y
	13	Teaching specialisation	Y (SiAS)	Y	N	Y	N	N
	14	Course satisfaction	Y (GOS)	Y	Y	Y	Y	Y
Teacher information	15	Teacher demographic information	N/Y (TRA/SiAS)	Y/Y (2)	Y/N (3)	N/Y (3)	N/N	N/N
	16	Post ITE qualification/s	N/Y (TRA/SiAS)	Y/Y	Y/N	N/Y	N/N	N/N
Registration information	17	Registration conferral year	N (TRA)	Y	Y	N	Y	Y
	18	Registration Status (4)	N (TRA)	Y	Y	N	Y	Y
	19	Teaching restrictions		Y	Y	N	Y	Y
Employment information (5)	20	Employment status	SiAS/GOS (6)	Y	N/Y	Y/Y	N/Y	N/Y
	21	Teaching load	SiAS	Y	N	Y	N	N
	22	Current school employed at	ACARA	N	N	N	N	N
Teaching information	23	Teacher perception of helpfulness of ITE program	SiAS	Y	N	Y	N	N
	24	Employer perception of teacher classroom readiness	SiAS	Y	N	Y	N	N
	25	Teacher perception of helpfulness of induction	SiAS	Y	N	Y	N	N
	26	Nature of current teaching position: teaching and non-teaching duties	SiAS	Y	N	Y	N	N
	27	Subjects and level taught	SiAS	Y	Y	Y	N	N
	28	Professional development	SiAS	Y	N	Y	N	N
	29	Teacher career intentions: intention to remain or leave teaching	SiAS	Y	N	Y	N	N
	30	Factors affecting intention to leave teaching prior to retirement	SiAS	Y	N	Y	N	N
	31	Unique teacher identifier (5)	TRA	Y	Y	Y	Y	Y

Notes

Data Ref #	Comment
1	AITSL has a database suitable for this purpose. http://aitsl.edu.au/initial-teacher-education/accredited-program-list. This database would need to be maintained for the proposed purpose, including the holding of information on programs whose accreditation lapses. A code would need to be provided for teachers registered on the basis of an overseas qualification. This information would provide data on the flow of teachers from overseas.
2	Basic demographic data is collected by TRAs, but the data collected is state/territory specific. The SiAS survey includes an agreed national approach to collecting more extensive data. TALIS also collects this data for the purposes of international comparison. The data specification used supports such comparisons.
3	Data sourced from TRAs can be linked using a unique identifier as was created for the NTWD. Data sourced from SiAS cannot be linked to items outside the survey.
4	The registration status recorded for teachers varies by jurisdiction. Nationally consistent data could be created by mapping to common categories such as 'provisional' and 'full' registration. A suitable approach was adopted for the creation of the NTWD.
5	Teacher employers also specify and capture this data. Its specification, collection and associated data environments are employer specific and volatile.
6	Both the SiAS and the GOS provide useful data specification that could be utilised for data collection.

6. Blueprint for initial teacher education and workforce data

Section 4 of the report recommended an architecture for the ITE and teacher workforce data to be collected on an ongoing basis for policy, planning and evaluation purposes. The data are set out in the form of a Data Framework with an associated minimum dataset and data attributes. Section 5 of the report mapped the data items in the Framework against current ongoing and ad hoc data collections to identify data gaps and identify necessary enhancements to currently collected items. The data for teachers from the time of initial registration through early career and later career employment were identified for new or refined data collection.

This Blueprint section of the report:

- provides options to address the data gaps and achieve desirable data enhancement identified in section 5;
- outlines the rationale and possible approaches for linking student and teacher level data;
- proposes approaches for making this data available to users, including data warehousing arrangements;
- proposes implementation phases to achieve a national ITE and teacher workforce dataset; and
- proposes reporting arrangements for the data.

6.1. Options for collecting data for the Data Framework

There are several options for collecting the required teacher data from initial registration through early career to later career employment with the desired data attributes:

- individual teacher level data;
- data items able to be linked to the individual;
- national data specification;
- consistent national data collection;
- accurate data;
- timely data;
- data collected with desired frequency; and
- data with desired level of completeness – all registered teachers in scope and complete data collected.

These include:

1. data collected by TRAs at the point of initial registration or registration renewal;[3][4]
2. data collected on registered teachers outside the teacher registration cycle;
3. a supplementary survey of ITE graduates linked to the GOS to collect data in the year after graduation;
4. data collected from teacher employers, including in conjunction with the data collection for ABS's *Schools, Australia*;
5. a SiAS-like survey based on a sample of teachers in a sample of schools.

[3] Data collection by the TRAs is in line with the recommendation 36 in the TEMAG report, that "… Teacher regulatory authorities collect robust workforce data on a nationally consistent basis, including areas of specialisation, to inform workforce planning."

[4] Data collection 'by TRAs' in option 1. and 3. above includes data collection facilitated by the TRAs registration and renewal processes or by using their teacher contact database with a third party possibly responsible for data collection as in the case for AHPRA and the health professions.

These options have been evaluated against the desired data attributes to achieve the national minimum dataset. Table 5 below provides the results of this analysis. The results have been used to propose data collections strategies below.

6.1.1. Data collection at initial teacher registration

The point of initial teacher registration provides an ideal opportunity to generate or capture a number of data elements from the minimum dataset for ITE and the teacher workforce. Data could be captured on all registering teachers. This approach offers a response rate of over 90% on voluntary items and would provide complete and accurate data. These data are:

Administrative data

- unique teacher identifier[5]
- registration conferral year
- registration status
- registration restrictions
- regulatory body
- gender
- year of birth

Survey data (voluntary)

- Aboriginal and Torres Strait Islander status
- language spoken at home
- country of birth
- year of arrival
- ITE program
- qualification level
- qualification field
- qualification year
- teaching specialisations
- subjects studied at tertiary level

[5] This data item is discussed further at 6.2 below.

Table 5: Data collection options against the desired data attributes

Data collection option	Scope of information available	National specification	Individual level data	Linkable	Nationally consistent collection achievable	Frequency	Completeness /response rate
1. Data collected by TRAs at the point of initial registration or registration renewal	All registered teachers	Yes, by using common definition for data collection or subsequent mapping	Yes	Yes	Consistent for data collected at initial registration Consistency for data collected at renewal could be improved over time	Renewal cycle is variable ranging from 1 to 5 years	100% for admin. Data. > 90% (est.) for survey data
2. Survey of registered teachers outside the registration cycle	All registered teachers	Yes, by using common definition for data collection	Yes	Yes	Consistency could be achieved through a common survey strategy	Able to be determined by national agreement	20% (est.) for survey depending on survey methodology used
3. Graduate Outcomes Survey supplementary items	All ITE graduates about 4 months after graduating including all who register as teachers	Yes	Yes	Yes .	Yes	Yes Annual but in the first year post-graduation only	About 55% for the last two annual surveys
4. Data collected from teacher employers	Employed teachers only	Yes, by using common definition for data collection or subsequent mapping	Yes Not in the case of the current School Aust. Collection	Yes Linkage rates of 90% achieved in NTWD	Consistency could be achieved over time. Divergent approaches embedded in information processes and systems	Able to be determined by national agreement	100% if all employers participate
5. "SiAS-like" survey based on a sample of teachers in a sample of schools	Employed teachers in sample scope only	Yes	Yes	Linkage possible if respondent provides linkage information. Rates to be determined	Yes	Previously a 3 year cycle	Inadequate at state/territory level

Note: This information on TRAs draws on information in Appendix 8 – TRA operations and data collection

All TRAs currently collect data on the teacher's name, date of birth and gender and record registration status and conferral year. Regulatory body data was generated at point of data extraction for each TRA data record for the NTWD. The QCT currently collects data on secondary teacher specialisations at the point of initial registration and achieves a response rate of close to 100%.

To enable the collection of this data would require:

- agreement on the data items to be collected;
- adoption of common data definitions for data items;
- legislation to be enacted for TRAs to collect survey data items; and
- modifications to TRA registration processes and information systems over time to facilitate data collection and storage. Changes to data fields in systems could be aligned to system upgrades.

It is important to note that this data collection strategy does not imply a survey instrument and survey delivery platform is developed by each TRA. A more efficient approach would be for a single survey instrument and platform to be developed for utilisation by all TRAs, integrated into the registration process. This approach (which the AHPRA uses to collect survey-based data for health professions) would be a more efficient use of TRA resources and expertise.

6.1.2. Data collection during early career years

The minimum dataset items required for collection in the early career years are:

- **administrative data:**
  - unique teacher identifier, and
  - teacher registration status.

- **survey data (voluntary**):
  - teacher employment status;
  - teaching load – time fraction;
  - teacher classification;
  - salary range;
  - current school name;
  - year started with current employer;
  - school type;
  - school sector;
  - school location;
  - subjects taught;
  - year level taught;
  - teaching and non-teaching duties;
  - professional development;
  - teacher perceptions of the helpfulness of the ITE program;
  - employer perceptions of classroom readiness;
  - teacher perceptions of the helpfulness of induction;
  - teacher career intentions – intention to continue or to leave teaching; and
  - factors affecting intention to leave teaching pre-retirement.

Two approaches for the collection of these data are recommended as feasible and cost effective.

1. collect data through a voluntary survey at the time of registration renewal, and
2. supplement the GOS.

6.1.3. Voluntary survey at the time of registration renewal

AHPRA collects voluntary survey data at annual registration renewal for 14 professions, including medical practitioners and nursing. It has achieved a response rate of over 90% for each health profession. This data collection option would result in near complete, accurate and nationally consistent data on all registered teachers.

To enable the collection of this data via the recommended option would require:

- agreement on the data items to be collected;
- adoption of common data definitions for data items;
- legislation to be enacted for TRAs to collect survey data items; and
- modifications to TRA registration processes and information systems over time to facilitate data collection and storage. Changes to data fields in systems could be aligned to system upgrades.

As with initial registration, a single survey instrument and platform could be developed for all TRAs to utilise. It could be integrated into their registration process. Annual registration renewal is required in each profession; for example, nurses renew registration in April and May each year and medical practitioners in August and September each year. AHPRA supports the health regulatory bodies by collecting administrative and survey data through a single national online portal. Legislation underpins AHPRA's capacity to collect similar data via survey from health practitioners. Additional information is provided in Appendix 5.

Currently three states and territories require teacher registration renewal annually (NSW, Victoria and the ACT). In South Australia renewal is every three years, and in other states and territories the renewal period is up to five years.

6.1.4. Supplement the Graduate Outcomes Survey

The second approach is collection of additional data items through a supplementary survey of ITE graduates linked to the GOS. The GOS occurs about four months after graduation. In the last two survey waves around 70% of teaching graduates seeking full-time work were employed by the time the survey was conducted. In addition to the recommended survey approach, the supplementary survey would provide nationally consistent data on ITE graduates in all jurisdictions at the same point in time. Teacher employers/mentors could be asked about the classroom readiness of early career teachers through the ESS linked to the GOS in the same survey window.

The response rate for the GOS was around 55% in its last two waves. About two thirds of ITE graduates are from programs from which 50 or more students graduate annually. A frequency table of accredited ITE programs and graduate numbers is in Appendix 9. This survey response rate would result in a 95% confidence interval of 40–60 for ITE programs with 50 graduates. Data on employer and mentor perceptions of the classroom readiness of early career teachers could be obtained in the linked ESS. As part of the GOS, graduates are asked to nominate their employer/supervisor, who is contacted and surveyed shortly thereafter.

The GOS is conducted twice a year, for mid-year and end-of-year graduations in November and April respectively. The data is available within six months of the survey. The data from the GOS, including data from a survey supplement which contains the Commonwealth Higher Education Student Support Number (CHESSN), is reported to the Department. This data collection can be linked to other data collected for the ITE and NTWD as described below in section 6.2.1.

A pilot of this approach could be conducted in April 2016. If successful, this data collection method could be implemented from the 2017 GOS/ESS.

6.1.5. Data collection during the later career years

The minimum dataset for teacher supply and demand in the years following the early career years is:

- **administrative data:**
  - unique teacher identifier, and
  - teacher registration status.

- **survey data (voluntary):**
  - teacher employment status;
  - teaching load – time fraction;
  - teacher classification, including leadership positions;
  - salary range;
  - year started with current employer;

- current school name;
- school type;
- school sector;
- school location;
- subjects taught;
- year level taught;
- teaching and non-teaching duties;
- professional development;
- employer perceptions of classroom readiness;
- teacher career intentions: intention to continue or to leave teaching; and
- factors affecting intention to leave teaching pre-retirement.

As with data for teaching in early career years, and for the same reasons, the recommended option is that data be collected by voluntary survey at the time of registration renewal. To enable the collection of this data via the recommended option would require the same actions for the collection option to be enabled for the early career years. Again, a single survey instrument and platform could be developed for all TRAs to utilise, integrated into the registration process.

Recommendation 3: That the data collection strategy for the ITE and teacher workforce data is through a combination of data collected by teacher regulatory authorities and a GOS supplementary survey of ITE graduates.

The acceptance of this recommendation would accord with the data collection principle provided for the project that "data collection should be integrated into existing collection mechanisms where possible …" and give effect to the TEMAG recommendation of an expanded role for TRAs in the collection of ITE and teacher workforce data. The collection of data through a combination of administrative and survey data, primarily through the agency of TRAs, corresponds to the two sources used for the NHWD. As in the case of the health professions, an expanded data collection role for TRAs will need to ensure that their capacity to function as regulatory bodies is not impaired.

This strategy would result in the collection of self-reported data from teachers. The accuracy of the data could be tested by comparing the data to a sample of that available through teacher employer administrative surveys and the need for corrections for bias assessed.

6.1.6 Data collection for broader workforce profiling and benchmarking

During consultations for the project, stakeholders supported the continued collection of broader data on the teacher workforce and their attitudes and intentions, including in relation to schooling system policy settings and practices. These data provide insights that support governments' and teachers employers' capacity to recruit, retain and develop high performing teachers and school leaders.

This data has previously been collected through the ad hoc SiAS survey. This survey collects an extensive range of data and typically takes respondents over 30 minutes to complete. The incorporation of the collection of this data into the survey of teachers at registration renewal runs the risk of depressing response rates and is not recommended.

A voluntary survey of registered teachers offers an efficient and reliable way of collecting this data. This survey could be conducted online by a third party during a single period nationally, with TRAs contacting teachers to invite participation. Whilst a school-level survey of a sample of schools would still be required, preliminary estimates of cost indicate the survey could be run in a way that achieves reliable population estimates at the state and territory level at a fraction of the cost of the SiAS survey. With this method, the TRA would invite participation in the survey and provide a link to the online survey site.

This method of data collection would be available from 2018 onward when all employed teachers in Australia will be registered. As discussed in section 4.3, jurisdictions must agree on the data items to be collected and the associated data element dictionary. The 2013 SiAS survey instrument would provide a useful basis for this discussion.

Recommendation 4: That the data collection strategy for teacher workforce data that is not part of the minimum dataset for ITE and the teacher workforce is collected through a survey of registered teachers outside the cycle of registration renewal.

6.2. The unique teacher identifier

A cross-section of stakeholders strongly supported the development of a unique teacher identifier as fundamental to improving the quality of data both on ITE and for the teaching workforce. Expert opinion was definite, and positioned the creation of such an identifier as the single most important innovation to be achieved from the current project.

The benefits of collecting ITE and teacher workforce data are set out in section 2.3, and include:

- improved data on the employment outcomes of ITE graduates, their experience of their course, attitudes to teaching related to information on their local labour market and the school context in which they are working, and background characteristics of individual and course; and
- the capacity to better understand locations, behaviours and intentions of teachers and school leaders over time to determine such things as deployment and attrition rates, increases in casualisation rates, and the effectiveness of workforce planning initiatives.

The capacity to realise these and other key benefits depends on linking the data across collection periods. A unique teacher identifier is required for this purpose to link at the individual teacher level. Privacy legislation will not allow the release of data that identifies the individual by anyone collecting such data[6].

It is proposed that a suitable unique identifier is created by the TRAs and provided with the data they release at the time of data extraction. This approach was approved and adopted in the creation of the NTWD. The data for release to the NTWD was extracted from contributing databases, including the TRA databases, and included name, data of birth, and gender. An algorithm was used to create a unique teacher identifier from these fields. The algorithm used to create the NTWD is owned by the Department. The use of this algorithm would enable linkage of the data in the NTWD with the data in the recommended ITE and teacher workforce dataset.

In the comparable arena of health professionals workforce data, as part of the registration process for all health professionals a unique identifier is created by the regulation agency, AHPRA. The identifier is provided to the data custodian (AIHW) to link data at the individual health professional level across collection cycles; it is a data element in the NHWD. A similar approach to the creation of a unique teacher identifier for the minimum dataset for ITE and the teacher workforce is recommended.

An identifier that applies to each teacher's data throughout their careers also has the potential to support the TRAs in their regulatory role through data created in one state or territory being available in all. A benefit of the unique identifier cited by relevant stakeholders as not anticipated at the time when the NHWD was created is that the emerging area of business analytics can support the regulatory function by identifying data variable values associated with high risk of breaches of the regulatory environment to target audit and investigation. A parallel benefit may exist in the teacher workforce domain.

[6] Advice provided to the project by AIHW suggested that the legislative constraints on the release of data identifying individuals may in the future be relaxed if suitable arrangements are put in place by the entity receiving the data. In this case data identifying individuals could be released by data custodians and statistical linkage could take place subsequently.

6.2.1 Linking HESDC student data to teacher data

During consultations stakeholders expressed a strong desire to be able to connect the data collected on the teachers in the early career years with the data collected on ITE students at the individual student/teacher level to:

- enable an examination of the influence of student characteristics and students' experience of the outcomes from ITE programs; and
- better understand the pipeline of teacher supply from the beginning of tertiary study and the effectiveness of policy initiatives during this period. This could include assessments of the effectiveness of the equity initiatives for under-represented groups to enter teaching – including Aboriginal and Torres Strait Islander, disabled, low-socio-economic-background, culturally and linguistically diverse students, and rural and remote students. Such equity interventions have been a strong focus of government in recent decades.

An effective approach to linking TRA and teacher employer data was agreed during the establishment of the NTWD. This involved a statistical linkage key constructed from the name, year of birth, and gender of individuals in the TRA and employer datasets that were combined to form the NTWD. The data matching achieved was 90%.

A similar approach could be used to link TRA data and HESDC data. The statistical linkage key could be introduced into datasets before their release to a data warehouse. This approach would build on the legacy of the NTWD. The linking would need to be undertaken by one of the three agencies authorised to undertake linkage of commonwealth government data.

Similar value in linking pre-graduation and post-registration data has been agreed in several health professions. Dialogue is reportedly underway involving the Deans of Medicine, AHPRA and AIHW to link medical practitioner student data and the data on registered medical practitioners at the individual level. A similar dialogue is reported to be underway for the nursing profession.

An alternative method of linkage would be to collect students' CHESSN on a voluntary basis for this linkage purpose at the time of initial registration. Trialling would be required to determine response rates and data accuracy.

Recommendation 5: That a unique teacher identifier is created for the ITE and teacher workforce dataset and a statistical linkage key is implemented to link ITE student data to TRA teacher data at the individual level.

6.3. Data sharing and warehousing

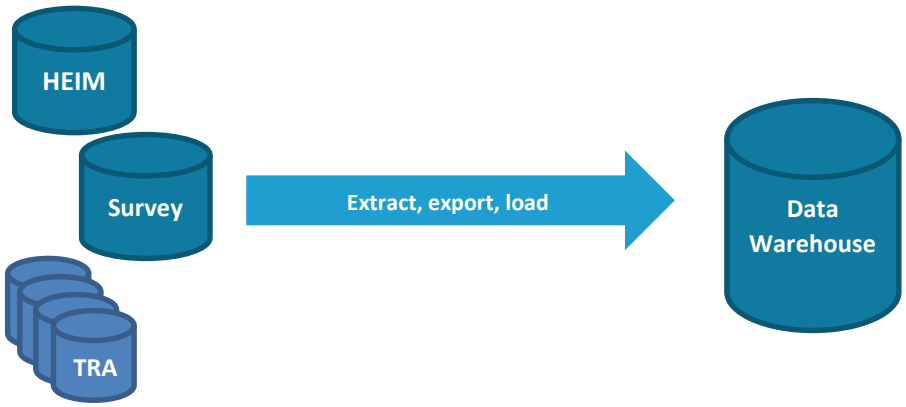
The ongoing collection, storage and reporting of a national ITE and teacher workforce dataset requires the services of a data custodian with warehousing and business intelligence capability, along with the capacity to provide authorised users with access to the data on an ad hoc and/or systematic basis.

6.3.1. The functionality required from the data warehouse

It is proposed that the data sources would transform data into suitable formats and extract it for export to the data warehouse. At the warehouse end the data would be validated, cleaned, reformatted, restructured and supplemented with data from other sources as required. This process is illustrated in the diagram below. Procedures at the warehouse end would assign standard names to each field and then organise the data in a way that facilitates analysis and reporting.

The warehouse should become the primary source of 'truth' for ad hoc and scheduled report generation, data mining, analysis and presentation through portals and dashboards. Business intelligence tools provide the ability to create value from the data.

Figure 3: ITE and teacher workforce data sharing and warehousing



Business intelligence capability is now commonplace in organisations managing large datasets. The ability to extract and connect large datasets from different sources is achieved through clearly specified business and functional requirements and well-designed data models, and consistent data fields. These approaches are based on the principle of interoperability and the ability to extract data from disparate sources, and transform the data to produce the reports and analysis required.

This is a rapidly evolving field, and it is wise to take a design–prototype–grow approach to developing this capability.

Data release protocols for the release of source data, the design of a data model and the development of business and functional requirements will be required before data can be transitioned to the warehouse. These documents will specify the arrangements and requirements for extracting datasets from existing source systems and transferring them to the warehouse; for example:

- data fields to be excluded – most databases will include information that is not required for the Framework, and these need to be identified and excluded from the extraction process;
- validation and normalisation requirements – these will be particularly important requirements for TRA databases where the same data fields are being extracted from a range of sources and formats; and
- stipulation of how often, at what point in time, and from where the data will be extracted: determination of whether the data is to be extracted on a daily, weekly, monthly or annual basis; whether extraction will occur on a particular day and/or month; in what manner the data will be passed to the warehouse; what processes are required to facilitate the transfer.

The NTWD provides a model for the provision, use and release of workforce data and has the support and goodwill of TRAs and employer bodies across jurisdictions. The NTWD Data Management Framework was developed in consultation with jurisdictional privacy commissions and sought to minimise the risk of identification of individuals in the collection and release of NTWD data. The Framework also provided guidance in relation to the normalisation and classification of the data.

6.3.2. Selecting a suitable data custodian

A range of capabilities will need to be addressed in relation to identifying a suitable data custodian.

Experience in data warehouse infrastructure – the development and infrastructure support for an ongoing data warehouse system is important in ensuring that the data held is managed in an efficient and effective manner. Strong business rules support data quality and management. Well-resourced data warehousing capability and infrastructure is an essential requirement for custodianship.

Data protection/risk management - Data risk often results from the failure of internal data management processes or from external events. The data custodian must be able to maintain business continuity in the event of loss of services; maintain critical or sensitive data; and comply with applicable legislation.

Data linkage capability within the data warehouse – big data analytics tools and techniques will extract additional value from the data. Linking information within the warehouse at a unit record level will enable easy extraction of the data for this purpose. This activity requires high-quality warehousing capability and governance.

Provision of data to authorised parties – the ability to provide access to the data through appropriate processes and protocols and tools such as online portals and/or dashboards will reduce costs and the time required to obtain value from these data. A custodian must be able to manage efficient access to appropriate levels of data and provide the education and support to external users as part of their standard practices.

There are many agencies that could be considered for data warehousing. Their merits will need to be tested through a formal process. The criteria above are proposed for inclusion in this assessment.

Recommendation 6: That arrangements for data custodianship for the ITE and teacher workforce dataset are agreed at the earliest stage of implementation.

6.4. Indicative costing of recommended approaches to data collection and warehousing

The adoption of the recommended approaches to data collection and warehousing for the ITE and teacher workforce dataset would result in a range of costs that include:

- the annual cost of the supplementary component of the GOS and ESS;
- the cost of survey data collection by TRAs at time of initial registration and registration renewal, plus the cost of integrating the link to these surveys into TRA processes;
- the cost of a survey of registered teachers by a third party outside the teacher registration renewal cycle; and
- the cost of establishing and operating the ITE and teacher workforce data warehouse.

The implementation plan in this section sets out an approach to developing indicative costing information for each of these cost items, except for the cost of integrating surveys into TRA registration renewal processes. This cost would need to be identified through an analysis of the TRA processes into which a link to the surveys is to be integrated. This cost could be minimised by timing this system enhancement with scheduled system upgrades.

The recommended approach of integrating data collection into the existing GOS/ESS and the existing administrative processes of TRAs will minimise cost and respondent burden whilst maximising response rates.

6.4.1. Supplementary survey – Graduate Outcomes Survey and Employer Satisfaction Survey

The Quality Indicators for Teaching and Learning fact sheet indicates that universities and other higher education providers can negotiate additional items for the GOS at a fixed cost of $265 per item. Most universities have more graduates annually than the approximately 17,000 ITE students who graduate nationally each year. The cost of $265 could therefore be used as an estimate of the additional cost per item for ITE graduates.

The 2013 SiAS survey sought similar information to that proposed for the GOS/ESS supplementary survey. Relevant items from this survey could be used to produce an estimate of the number of additional items required in the GOS supplementary survey.

The estimated cost per additional item combined with the estimated of number of additional items required would provide an estimate of the annual cost of the GOS supplementary survey. The actual cost would be the subject of negotiation with the Social Research Centre which holds the contract for the conduct of these surveys. Negotiations would need to ensure similar questions were not proposed by individual ITE providers. At the time of writing, no such requests had been received by the Social Research Centre.

6.4.2. The cost of survey data collection by TRAs

The proposed approach to survey data collection by TRAs is by using a single survey nationally at initial registration and registration renewal with a link to the survey integrated into TRA registration and renewal processes. This approach would minimise costs and ensure national consistency in the data collected.

The estimated number of new teachers registering annually plus the number of early career and later career teachers renewing their registration annually could be used to obtain an estimate for the annual survey costs from a commercial provider of survey services and the extraction of this data on an agreed schedule. The actual costs of implementing the surveys by TRA at the time of initial registration and registration renewal would depend on:

- the estimated length of the survey;
- the survey schedule in each state and territory, that is, the frequency of registration renewal and time 'windows' during which registration and renewal occur;
- the schedule of data extraction and export to the data warehouse; and
- the services and cost negotiated with a service provider.

6.4.3. The cost of a survey of registered teachers by a third party outside the teacher registration renewal cycle

Commercial service providers could estimate the cost of this online survey on the basis of:

- the size of the population to be surveyed (over 400,000 registered teachers);
- the approximate survey length (under 15 minutes);
- advice regarding the method of contact with the survey population (email invitation by TRAs);
- the number of reminders required; and
- anticipated response rate (20%).

This estimated cost is expected to be a fraction of the cost of conducting the 2013 SiAS survey, bearing in mind that to obtain equivalent data, a survey of a sample of schools for school-level data would still be required. The actual cost would be determined through procurement of specified services from a service provider and take account of the frequency with which the survey is conducted. The proposed frequency is once every three years.

6.4.4. The cost of establishing and operating the recommended data warehouse

In the absence of a precise and detailed functional specification, estimating the cost of establishing and operating the data warehouse is the least certain of the cost items covered. The cost of establishing the NTWD could be used to provide an order-of-magnitude cost of establishing the ITE and teacher workforce dataset. The number of records to be warehoused and the nature of the data elements are similar. Actual costs would be determined by the functionality required of the warehouse.

Operating costs would be determined by the functional specification developed for the warehouse. A discrete annual cost item would be the data linkage to commonwealth government data. This cost would need to be negotiated with one of the three agencies authorised to undertake such linkage.

6.5. Implementation of a national ITE and teacher workforce dataset

This implementation plan sets out a phased approach to implementation of the ITE and teacher workforce dataset. It separates out the following aspects of implementation for each phase:

- governance arrangements;
- data collection and release;
- data warehouse design, development and operation; and
- data reporting.

Figure 4 illustrates the progressive loading of datasets into the recommended data warehouse across a five-year implementation timeline. There is a range of legislative, governance, technological and resourcing challenges to be

overcome in the establishment of the ITE and teacher workforce dataset. These challenges will result in the datasets becoming available for loading at different times as these challenges are addressed. Prototype testing is built into the implementation schedule to ensure proposed benefits are realised and necessary safeguards are in place and problems identified and resolved speedily.

6.5.1. Assumptions

In setting out the implementation plan, the following assumptions are made.

1. The recommended approaches to data collection are adopted. This includes TRAs becoming a key point for data collection, both in their own right and as a point of contact for third-party collection (recommendations 3 and 4). The other main sources of data are the GOS (supplementary survey plus employer satisfaction component) (recommendation 4) and HEIMS.

2. It takes six to nine months to achieve changes to TRA legislation to enable the recommended approach to data collection to commence.

3. The recommended approach to the storage of ITE and teacher workforce data is adopted and the data are warehoused in one location, with suitable governance arrangements agreed at an early stage.

4. The data release protocol for TRA data results in data release within 10 working days of cut-off dates. The service standards for the data warehouse results in data being available for reporting within two months of data receipt for discrete datasets and four months where data linkage is involved. These standards are based on those in operation for the NHWD warehoused by the AIHW.

5. The statistical linkage key (unique teacher identifier) in recommendation 5 is agreed to facilitate the linkage of teacher data from TRAs at the individual teacher level across collection cycles and to link these data to the data held in other datasets:

    - GOS/ESS;
    - HEIMS; and
    - national surveys of registered teachers and school leaders outside the cycle of registration renewal.

    Detail was provided in section 6.2.

6. All teachers nationally are registered by TRAs by the third implementation year. From this point onward the data could be collected by a survey of all registered teachers contacted by the TRAs and outside the teacher registration renewal cycle (recommendation 4).

7. The cost-benefit analysis at the end of year 1 leads to a decision to proceed with implementation.

6.5.2. Data collection and reporting

The more detailed arrangements proposed for data collection to facilitate implementation are:

- administrative data and survey data are collected by TRAs in real time and at registration/renewal and released to the data warehouse on an annual basis according to a data release protocol:
    - the annual reporting of new teacher registration data has an annual cut-off date of the end of February (after the commencement of the school year). These data are shown as TRA dataset 1 in Figure 4;
    - the reporting of data on early career teachers occurs at registration renewal for the first three years following initial registration conferral. The data are released to the data warehouse with a common agreed cut-off date. These data are shown as TRA dataset 2 in Figure 4;
    - the reporting of data on later career teachers and school leaders at registration renewal from the fifth year of registration conferral onwards and not more frequently than every third year. The data are

released to the data warehouse with a common agreed cut-off date. These data are shown as TRA dataset 2 in Figure 4.

- The administrative data from TRAs are available from the second implementation year onwards. The survey data from TRAs will be available as TRAs negotiate the legislative, process, governance and information technology challenges involved in establishing survey capability. A four-year window is assumed, commencing from the second implementation year (test data only in year 2), for TRAs to progressively commence releasing survey data to the warehouse.
- If agreed nationally, the TRA survey could include a jurisdictional component seeking information of particular interest to that jurisdiction. This would increase the value of the creation of the ITE and teacher workforce dataset whilst minimising respondent burden.
- On the first occasion data on individual teachers is collected and exported, the administrative and survey data in both TRA datasets 1 and 2 are required, to obtain minimum ITE and teacher workforce data on all teachers.
- Additional survey data (in additional to the minimum ITE and teacher workforce dataset) is collected at a common point of time outside the TRA cycles of teacher registration renewal. It is suggested that the TRAs are the point of contact with teachers and invite their participation in this survey. These data are shown as "TRA" dataset 3 in Figure 4. These data would be available for release to the warehouse from the third implementation year onward.
- Survey data on new ITE graduates collected via the supplement to the GOS/ESS is collected twice yearly according to the GOS survey schedule (April and November). These data are released to the warehouse in November each year; for example, data for 2016 mid-year and end-of-year graduates surveyed in November 2016 and April 2017 respectively are released to the warehouse in November 2017. These data are exported to the warehouse annually from November of the second year of implementation onward. These data are shown in Figure 4 as GOS/ESS dataset.
- HEIMS data is released to the warehouse at the end of June each year, using field of study 'teacher education' as a filter. These data are shown on Figure 4 as HEIMS dataset.
- The data custodians agreed that Ernst and Young would house the NTWD. These data are shown as NTWD dataset in Figure 4 and would be available for export to the warehouse when release is negotiated with the 21 data custodians who contributed data to NTWD. The data items in this dataset are listed in Table 6.
- The qualification dataset and a schools dataset are updated at suitable points to provide a history of qualifications and schools operating each year and as a source to create the drop-down menu for TRA survey collections. These datasets are shown as Qualifications dataset (proposed to be managed by AITSL) and Schools dataset (ACARA) respectively.

Figure 4: Population of data warehouse with minimum dataset data from the Data Framework

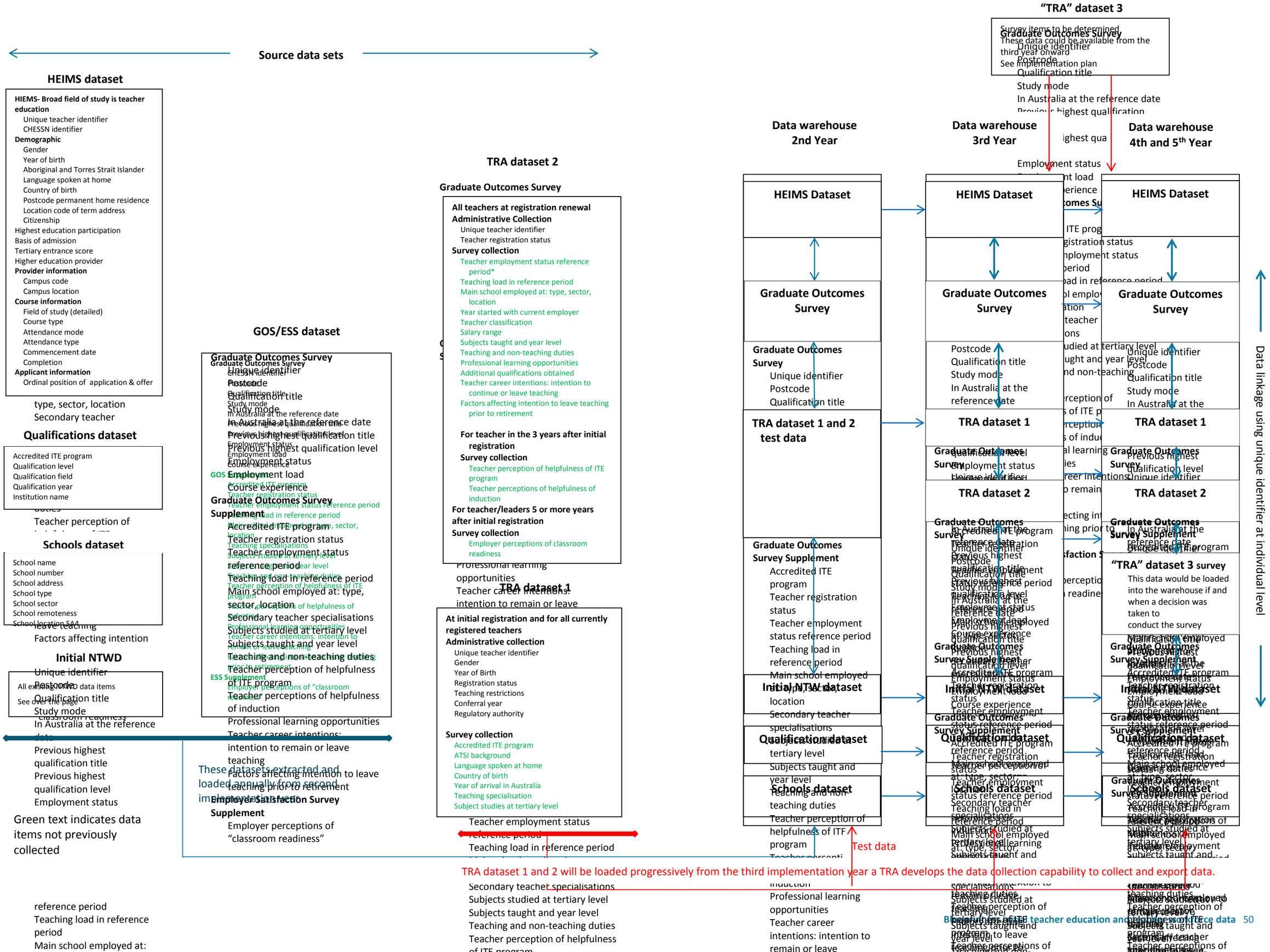


Table 6: Summary of NTWD data items

Category	Data Item	Short Definition	Included
Demographics	Gender	The biological distinction between male and female	Yes
	Year of birth	Year the individual was born	Yes +
	ATSI status	Australian Aboriginal and/or Torres Strait Islander origin status	Yes
	Country of birth	The country in which the individual was born	Yes
	Year of arrival in Australia	Year in which the individual first arrived in Australia (if applicable)	*
	Previous occupation group	Occupation group previously undertaken by individual (if applicable)	*
Qualifications	Level	The level of qualification awarded	Yes
	Field	The field of qualification awarded	Yes
	Institution	Tertiary education institution where qualification gained	Yes
	Year	Year in which individual graduated with qualification	Yes
	Specialisations	Fields of specialisation studied in qualification	*
Professional Development	Type	The form of professional development undertaken	No
	Area	Main field in which professional development was undertaken	*
Teacher Registration	Regulatory authority	The body responsible for registering the individual as a teacher	Yes
	Conferral year	Year in which individual gained registration as a teacher	Yes +
	Teaching restrictions	Any special conditions or restrictions placed on registration	Yes
	Specialisations	Field of specialisation or specific subject areas noted on registration	No
	Registration level	Level or stage of professional teaching standard individual has attained	Yes
Current Employment	Employment status	Active status of employment (eg. active, paid/unpaid leave)	Yes
	Year started	Year individual commenced employment with current employer	Yes +
	Time fraction employed	Usual working load as a decimal of a full-time working load (1.0)	Yes
	Type of employment	Nature of employment in relation to expected continuity and eligibility for basic leave entitlements (eg. permanent, casual, fixed)	Yes
	Employee classification	Level employed with respect to employment structure	Yes
	Salary	The individual's total salary/remuneration package value per annum	Yes
	Salary increment level	The increment level/salary band associated with the individual	No
Current School	School type	Type of school of teacher, in terms of year levels represented	Yes
	School sector	Sector of school of teacher (eg. Gov, Cath, Ind)	Yes
	School location	Location of the school of teacher with respect to remoteness	Yes
Current Teaching	Subject area(s)	All subject areas currently taught by the individual	*
	Year level(s)	All year groups currently taught by the individual	No
	Other duties	Additional duties performed in addition to role or classification	No
Exit from Teaching	Year of leaving	Year at which individual separated or exited the teaching profession	^
	Reason for leaving	Reason for individual's permanent exit from the teaching profession	*
	Destination	Occupation group undertaken after exiting teaching profession	No
Teacher Supply	Teacher graduates	Counts of enrolments and completions by specialist area	^
	Teacher pools	Counts of persons on regulatory authority and employment lists	^
	Net migration	Counts of teachers registered from overseas and residing overseas	^
Teacher Need	Adequacy	Counts of shortages/vacancies by learning area	*
	Current requirements	Extent of current teacher need for each of the main learning areas	*
	Future requirements	Teacher career intentions and teacher projections	*

^ Data collected in aggregate form to supplement the unit level data.

* Not consistently collected by teacher employers or regulators to enable inclusion at unit level. As an interim measure, substitute data this data item has been collected in aggregate form from alternative sources to supplement the unit level data.

+ Data item name and definition indicate collection of calendar year from source data custodians for these data items for development of the NTWD. However names and definitions for these data items have been altered for releases of data from the NTWD to represent number of years (or age), as noted in the Data Dictionary.

Source: National Teacher Workforce Dataset Data Dictionary, June 2014, Australian Government: https://docs.education.gov.au/node/36287

Figure 4 illustrates the loading of these datasets into the warehouse as data sources become available. New data items not currently collected in regular collections are distinguished from existing data by colour coding. Administrative data is distinguished from data collected by survey.

The reporting of data from the national ITE and teacher workforce dataset will inform the dialogue between the many stakeholders with responsibility for ITE and the teacher workforce. Cooperative efforts by governments, teacher employers, teacher education providers, TRAs, schools and representative bodies are required to ensure the recruitment, retention and development of an effective teacher and school leadership workforce. The data has the capacity to fill information gaps and support collaboration nationally as well as at the jurisdictional and local level. For individual students, teachers and school leaders, it offers an improved basis for choosing and managing a teaching career based on improved market information.

Enhanced reporting is enabled from the third year of implementation.

6.5.3. Implementation phases

Implementation is proposed in six phases over five years. A detailed implementation plan is provided below and summarised in Figure 5.

First year – Phase 1: Initiation

This phase involves:

- approval in-principle for the establishment of a national ITE and teacher workforce dataset; and
- agreement on the minimum dataset for ITE and the teacher workforce and associated documentation, including a data element dictionary.

First Year – Phase 2: Detailed architecture, governance and costings

This phase involves the design of detailed architecture for data collection, warehousing and release, costings, and agreement on governance structures. This phase will result in a detailed cost-benefit analysis for the national ITE and teacher workforce dataset and a detailed business case.

Governance arrangements

Roles and responsibilities for data collection, storage and reporting are agreed.

Governance arrangements for the collection, storage and reporting of the national ITE and teacher workforce dataset are agreed. Early agreement of governance arrangements is critical to the successful execution of implementation phases and the establishment of the ITE and teacher workforce dataset.

Data collection and release

Graduate Outcomes Survey (GOS) and ESS supplementary surveys are piloted in April. The results of the pilot would be available in November. Parameters for the ongoing collection are specified and costings obtained.

Design and costing of TRA survey data collection capability:

- survey instruments and online survey platform suitable for use by all TRAs are designed and costed;
- modification to TRA information technology environment to incorporate an online survey in a sample of TRA environments is costed; and
- the need for legislation modifications in each jurisdiction to enable collection to proceed is determined.

Specification and responsibility for the qualification and schools datasets negotiated:

- qualification dataset, and
- schools dataset.

Data release protocols are agreed for the minimum ITE and teacher workforce dataset:

- the annual release of minimum ITE and teacher workforce data items from TRAs to the warehouse (TRA dataset 1 and TRA dataset 2);
- the annual release of minimum ITE and teacher workforce data items from HEIMS (HEIMS dataset);
- the annual release of minimum ITE and teacher workforce data items for GOS and ESS supplementary survey following piloting (GOS/ESS dataset);
- the annual release of the qualification and schools datasets (Qualifications dataset and Schools dataset); and
- the one-off release of NTWD data to the warehouse negotiated with the 21 data custodians of NTWD data (NTWD dataset).

These protocols would include specification of:

- data protection to achieve compliance with privacy legislation;
- the annual cycle of data extraction;
- export file formats; and
- the generation and inclusion of the unique teacher identifier/statistical linkage key data.

Data warehouse design, development and operation

Data warehouse design and operations agreed, including:

- data storage:
    - datasets to be loaded, number of records and fields per dataset;
    - input data formats; and
    - frequency of dataset updates.
- warehouse data model;
- warehouse business and functional specification agreed, including data matching between input datasets;
- data linkage arrangement with one of the three agencies authorised to undertake the linkage of Commonwealth data;
- data release protocols and service standards; and
- costed proposals from data warehouse providers sought.

Reporting

Current reporting arrangements continue. AITSL Annual ITE Data Report includes current items, including:

- entry into ITE;
- characteristics of ITE students, without teaching specialisation; and
- progress through ITE.

Second year – Phase 3: Legislation, prototype build, testing and operation

This phase involves the development of the prototype TRA data collection, warehousing and release infrastructure and authorising environment.

Governance arrangements

Governance arrangements confirmed and funding arrangements are agreed.

A data custodian for the national ITE and teacher workforce datasets is agreed. The identification of a data warehouse service provider will assist in the identification of the data custodian.

Data collection and release

Graduate Outcomes Survey (GOS) and ESS supplementary surveys are commissioned.

- the pilot GOS/ESS dataset is extracted for import to warehouse mid-year, and
- the GOS/ESS dataset is extracted for import to warehouse in November[7].

Modifications to TRA legislation in 'early adopter' jurisdictions are completed to enable survey data collection by mid-year.

TRA online surveys and a survey platform are developed and tested by mid-year:[8]

- TRA survey capability is established in early adopter jurisdictions by mid-year for use in the second half of the year, and
- test data extraction of TRA datasets 1 and 2 for importation to warehouse from early adopter jurisdictions is undertaken.

The HEIMS, Qualifications, Schools and NTWD datasets are extracted for import to warehouse mid-year.

The data not identified as part of the minimum ITE and teacher workforce dataset and to be collected by survey of registered teachers outside the TRA registration renewal cycle is agreed. Teachers are to be invited to participate in this third party survey by TRAs. These data are represented in Figure 4 as "TRA" dataset 3.

Data warehouse design, development and operation

The data warehouse is developed in the first half of the year and is operational from mid-year:

- data warehouse is established:
  - building and testing of warehouse environments using test data from all input datasets; and
  - sign-off on operational compliance with design parameters.
- import into warehouse of:
  - NTWD dataset (one off);
  - HEIMS dataset (ongoing);
  - GOS/ESS dataset (ongoing); and
  - qualifications and schools dataset (ongoing).
- data linking of Commonwealth data to other ITE and teacher workforce data trialled.

Reporting

Current reporting arrangements continue. AITSL Annual ITE Data Report includes current items, such as:

- Entry into ITE;
- Characteristics of ITE students, without teaching specialisation; and
- Progress through ITE.

Third Year – Phase 4: Commencement of ongoing data collection, warehousing, data linkage and reporting

This phase involves the importing of all data into the warehouse, the commencement of data linkage between the datasets and enhanced reporting of ITE and teacher workforce data.

[7] Linkage of GOS/ESS data to other ITE and teacher workforce data may need to be undertaken by authorised agency.
[8] Testing could be undertaken in Queensland where existing legislation allows the collection of voluntary data by Queensland College of Teachers.

Governance arrangements

Governance arrangements are in place.

A decision on collection of "TRA" dataset 3 is taken. These are additional survey data not included in the minimum ITE and teacher workforce dataset. They would be collected at a common point of time outside the TRA cycles of teacher registration renewal, with the TRA inviting participation by teachers.

Data collection and release

Modifications to TRA legislation in all jurisdictions are completed to enable survey data collection.

- TRA dataset 1 is extracted in February from early adopter jurisdictions.
- TRA dataset 2 is extracted at agreed date from early adopter jurisdictions.
- GOS/ESS dataset is extracted November.
- HEIMS dataset is extracted mid-year.
- Qualifications dataset is extracted with frequency to be determined based on volatility.
- Schools dataset is extracted with frequency to be determined based on volatility.
- Collection of "TRA" dataset 3 data is now possible if agreed.

Data warehouse design, development and operation

The data warehouse is fully operational with specification enhanced to accommodate "TRA" dataset 3 data.

- Import and transformation of datasets:
    - some TRAs' datasets 1 and 2 (early adopters);
    - HEIMS dataset (ongoing);
    - data from GOS/ESS (ongoing); and
    - Qualifications and Schools datasets (ongoing).
- Data linking of Commonwealth data to other ITE and teacher workforce data.

Reporting

Current reporting arrangements would continue, plus the AITSL report would be enhanced by data from the GOS/ESS on ITE outcomes, reported at aggregated and disaggregated levels, including at the ITE program level, depending on survey response rates:

- the number and proportion of ITE graduates achieving provisional registration, including by specialisation;
- the number and proportion of registered teachers gaining employment in the year following graduation and in subsequent years, including by specialisation;
- the number and proportion of early career teachers who were satisfied with their ITE program;
- the number and proportion of early career teachers judged classroom ready by their employers and mentors;
- the number and proportion of early career teachers who were satisfied with their induction program; and
- the number and proportion of early career teacher intending to stay in teaching.

These data could be provided to ITE providers.

For those states and territories who supply TRA dataset 1 and 2 in the third year, comprehensive data on the above measures would be available for the majority of early career teachers. Through data linkage these jurisdictions would have access to enhanced data on all early career teachers who are registered teachers in their jurisdiction, that is, information on their period as an ITE student, registration information and early career as an employed teacher or a teacher seeking employment.

Additionally, these jurisdictions would have early access to one iteration of survey data on all teachers registered in their jurisdiction, including career intentions and any additional information that was agreed for inclusion in the jurisdictional survey. If additional jurisdiction specific items are agreed for collection through the TRA survey, this data would be available to early adopter jurisdictions from this point onwards.

The additional data measures that would be available for jurisdictions who supply TRA dataset 1 and 2 would include:

- diversity and background of the ITE entrant and graduate populations and the early career teaching population, including Aboriginal and Torres Strait Islader
- the number and proportion of ITE graduates achieving provisional registration and employment, by specialisation;
- the deployment rates of graduate teachers by school location;
- early career attrition rates by teacher background, specialisation and school location; and
- the impact on supply of graduates of enrolments in Masters of Teaching programs.

Several state and territory education department officials proposed a teacher supply and demand workshop to agree reporting arrangements that would optimise the use of this data and best support teacher supply and demand modelling at the jurisdictional and national level. A national teacher supply and demand report was one suggested outcome.

Fourth Year – Phase 5: Additional TRAs collect administrative and survey data

This phase involves additional TRAs collecting administrative and survey data, a more fully populated national ITE and teacher workforce dataset, and improved jurisdictional and national reporting.

Governance arrangements

Governance arrangements are in place.

Data collection and release

TRA dataset 1 extracted February from more jurisdictions.

TRA dataset 2 extracted at agreed date from more jurisdictions.

GOS/ESS dataset extracted November.

HEIMS dataset extracted mid-year.

Qualifications dataset extracted with frequency to be determined based on volatility.

Schools dataset extracted with frequency to be determined based on volatility.

Data warehouse design, development and operation

Data warehouse more fully populated with TRA datasets.

Reporting

The improved reporting of ITE outcomes and teacher supply and demand data described in third-year implementation above would be available to more jurisdictions.

Fifth Year – Phase 6: Most TRAs collect administrative and survey data

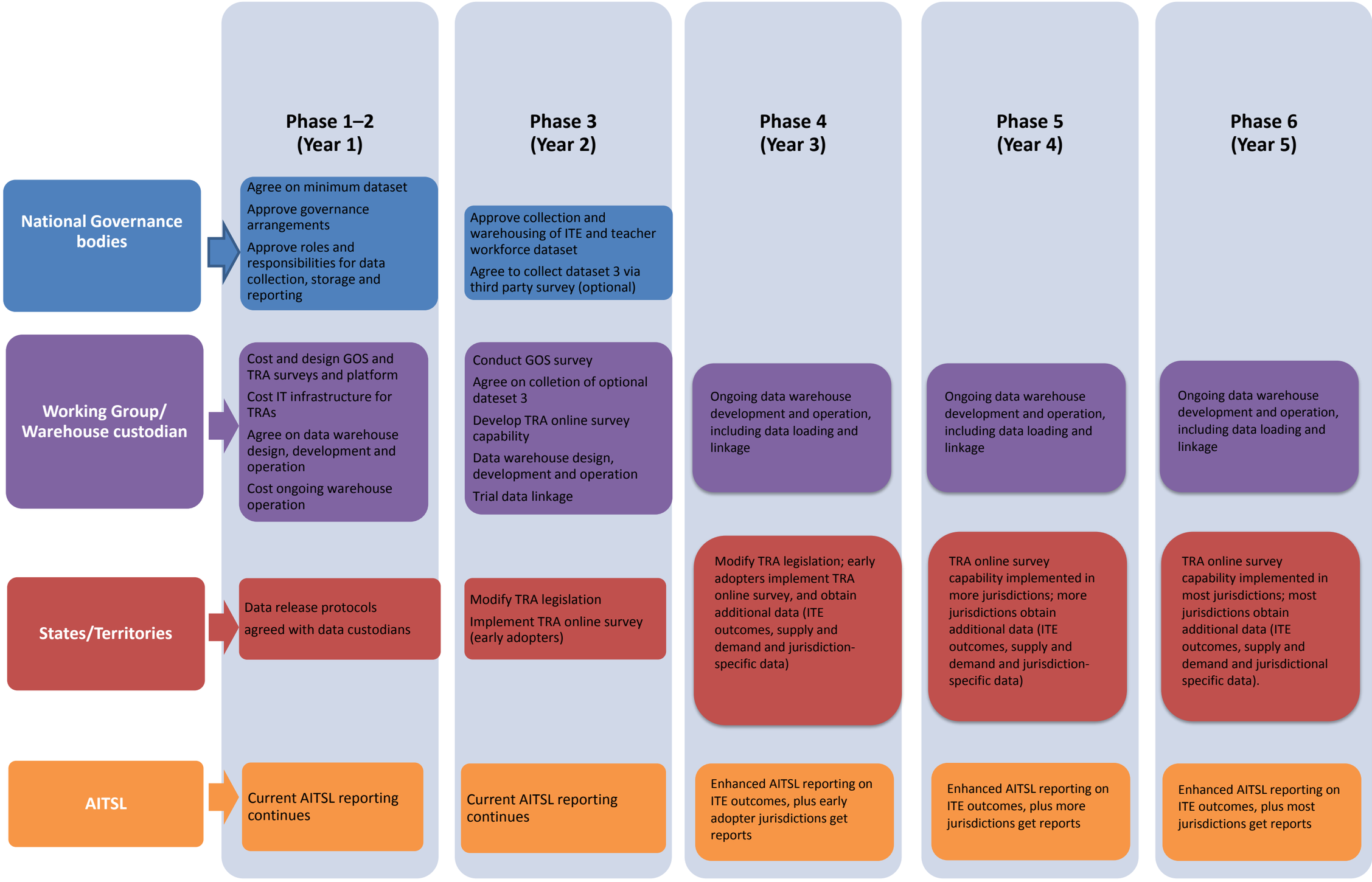
This phase involves most TRAs collecting administrative and survey data, an almost fully populated national ITE and teacher workforce dataset, and further improvement in jurisdictional and national reporting.

At this point in time early adopter jurisdictions could anticipate further enhancements to data to support teacher supply and demand modelling based on data from later-career teachers and school leaders in the next period. This would include information as proposed during consultations, including:

- attrition of teachers by specialisation;
- actual levels of teacher retention and teacher attrition. This gap means that departures from one school, sector or state are not identified as attrition if the teacher commenced teaching in another sector or state;
- trends in casualisation of the teaching workforce and the use of casual relief teachers; and
- the size and intentions of the potential teaching workforce – that is, numbers of registered teachers not currently teaching.

Recommendation 7: That a phased approach to implementation of the ITE and teacher workforce dataset be adopted.

Figure 5: Implementation flowchart



Appendix 1: Stakeholders interviewed

Employer bodies

Education and Training Directorate, ACT	Ms Coralie McAlister, Director People and Performance
Department of Education and Communities, NSW	Dr Jenny Donovan, General Manager, Strategic Information and Reporting
Department of Education, NT	Ms Susan Kulda, Director, Performance and Data Management
Department of Education and Training, QLD	Mr Christopher Kinsella, Acting Executive Director, Policy, Performance and Planning Mr Patrick Bryan, Director, Workforce Planning and Supply, Corporate Services
Department of Education and Child Development, SA	Mr David Engelhardt, Director, Business Intelligence Mr Sam Luddy, Manager, Strategic Data Development Ms Jenny Cirillo, Manager, HR Systems, Data and Planning Dr Kerry Kavanagh, Director Workforce Development, Human Resources and Workforce Development Ms Marg Sandow, Director, Strategic Policy and External Relations Ms Susan Cameron, Director, Review Improvement and Accountability Margot Foster, Director, Pedagogy and Leadership
Department of Education, TAS	Mr Tony Luttrell, Director, Educational Performance Services
Department of Education and Training, VIC	Ms Wendy Timms, Executive Director, Performance and Evaluation Ms Lucy Toovey, Acting Director, Leadership, Professional Practice and Accountability Mr Jim Tangas, Workforce Strategy Directorate
Department of Education, WA	Mr Alan Dodson, Director, Evaluation and Accountability Ms Christine Porter, Director, Workforce Policy and Coordination Mr Neil Purdy, Manager, Workforce Policy and Coordination Mr Ashley Lowth, Principal Consultant, Workforce Policy and Coordination

Teacher regulatory/ITE accreditation bodies

Teacher Quality Institute, ACT	Ms Anne Ellis, Chief Executive Officer Ms Anna McKenzie Ms Carol Rohead Mr Michael Bateman
Board of Studies, Teaching and Educational Standards, NSW	Mr David Cranmer, Director, Strategic Projects Mr John Healey, Director, Initial Teacher Education and Professional Learning
Teacher Registration Board of the Northern Territory	Ms Maree Garrigan, Director
Queensland College of Teachers	Ms Deanne Fishburn, Executive Manager, Professional Standards Ms Kim Newman, Executive Manager, Registration Mr Jason Rees, Manager, IT
Teachers Registration Board of South Australia	Mr Peter Lind, Registrar
Teachers Registration Board of Tasmania	Ms Lee Rayner, Registrar Ms Meredith Phillips, Manager Professional Standards and Registration Ms Julie Hunt, Manager of Registration and IT Systems
Victorian Institute of Teaching	Ms Melanie Saba, Chief Executive Officer
Teacher Registration Board of Western Australia	Mr Richard Miles, Director

Initial teacher education providers

University of Sydney	Professor Diane Mayer, Dean, Faculty of Education
University of Western Sydney	Professor Michele Simons, Dean, School of Education
Tabor Adelaide	Dr Frank Davies, Head of Education
More Aboriginal and Torres Strait Islander Teachers Initiative (MATSITI), University of South Australia	Mr Mark Tranthim-Fryer, Project Manager Mr Brian Marshall, Research Project Officer
University of Western Australia	Professor Vaille Dawson, Deputy Dean, Faculty of Education

Representative bodies – schools

Australian Primary Principals Association	Mr Dennis Yarrington, President
Australian Secondary Principals Association	Mr Andrew Pierpoint, President, Queensland Secondary Principals Association, representing ASPA
Association of Heads of Independent Schools	Mr Geoff Ryan, Acting Chief Executive
Independent Schools Council of Australia	Ms Colette Colman, Manager, Policy Analysis and Research Mr Andrew Long, Policy and Research Analyst
Australian Education Union	Mr David Colley, Federal Industrial Officer
Australian Curriculum, Assessment and Reporting Authority	Mr Rob Randall, Chief Executive Officer
National Catholic Education Commission	Mr Ross Fox, Executive Director

Representative bodies – universities

Australian Council of Deans of Education	Mr David Templeman, Executive Director
Australian Association for Research in Education	Professor Martin Mills, President Associate Professor Julianne Moss, Immediate Past President
Australian College of Educators	Professor Stephen Dinham, National President

Technical experts

Ernst and Young, Australia	Mr Mike Willett, Director, Enterprise Intelligence
Australian Council for Educational Research	Dr Paul Weldon, Senior Research Fellow
University of Melbourne	Associate Professor Janet Clinton, Director, Centre for Program Evaluation, Melbourne Graduate School of Education
University of Western Australia	Emeritus Professor Bill Louden, Emeritus Professor of Education
Education Services Australia	Nick Weideman, General Manager, Operations
Australian Curriculum and Reporting Authority	Steve Croft, Senior Manager, Data and Reporting
Australian Institute of Health and Welfare	Phil Anderson, Head, Data Linkage Unit
Australian Institute of Health and Welfare	Adrian Webster, Head, Expenditure and Workforce Unit
Australian Health Practitioners Regulation Agency	Graeme Collie, Student Registrar
Australian Health Practitioners Regulation Agency	Deborah Brown, Senior Research Fellow, Risk-based Regulation
Social Research Centre	Natalie Ryan and Jayde Grisdale

Other experts

Minter Ellison	John Livi, Special Council

Appendix 2: Interview schedule

The following generic interview schedule was adapted for each category of interviewee outlined in Appendix 1. The schedule was used flexibly to focus input on areas of interest to and knowledge of the interviewee.

Ideal Data Framework for Initial Teacher Education (a draft data framework for ITE was used as a prompt)

1. From your perspective, does the table of information needs capture at a high level the needs of stakeholders for investigating the effectiveness of ITE programs?
2. From your perspective, is the data in the draft Ideal data framework the correct data to answer information needs?
3. What data and information on ITE should be regularly reported in a national data report?

Measurement Framework for Future Initial Teacher Education and Teacher Workforce Data Needs

Policy and planning priorities

4. In relation to initial teacher education and teacher workforce data more broadly, what are your priority policy and planning needs for this data?
    - Supply and demand of particular teaching specialisations or in rural/remote locations?
    - The increasing number of part-time teachers and a casualised workforce?
    - Workforce capability and professional development?
    - What data do you hold on teacher effectiveness? What is planned?

5. In undertaking data analysis related to priority policy and planning activities, do you use state-based data/your own data, the NTWD, or national survey data?
    - If you have your own teacher surveys, why and what data is collected?
    - Could we have a copy of any report you produce and information on your survey instruments?

6. What are the key data gaps in what is currently available?
    - Do you have the access you would like to your teacher regulation body data?

National Teaching Workforce Dataset (NTWD) and Staff in Australia's Schools (SiAS) survey

7. How useful do you find the NTWD and SiAS? For what purposes do you use these data?
    - Are the data elements and their definitions okay at a national level and of relevance at state level?
    - Have you used the TALIS 2013 data?

Your teacher workforce data environment

8. Could you describe your teacher workforce data environment?
    - Do you have a data element dictionary for the workforce data you collect?
    - Do you have a standardised and regular data collection/s?
    - Has the data changed since the NTWD collection/is it volatile?
    - Do you have a fully integrated set of workforce data?

An expanded role for teacher regulation bodies

9. The TEMAG report *Action Now* observes that there are significant gaps in current information, including on teacher supply and demand. The report's recommendations for improvement include an expanded role for teacher regulation bodies. What do you see are major data challenges in such an expanded role?
    - ITE providers pre-registration of all entrants to ITE on a nationally consistent basis (TEMAG recommendation 35)
    - Collection of information by regulatory bodies of robust workforce data on a nationally consistent basis including areas of specialisation (recommendation 36)
    - Teacher regulatory bodies to share data to inform a national teacher workforce dataset to contribute to national teacher workforce planning (recommendation 37)
    - ITE providers to take into account national workforce needs when determining student ITE intake (recommendation 38).

A national data collection for the Framework

10. What benefits might the establishment of a national Framework for ITE and teacher workforce data and the regular collection of data to populate it provide for you?
    - What are the limitations and drawbacks to usefulness and implementation?
11. In the establishment of a national data collection to support the Framework, what would be the cost drivers for you?

Custodianship of the national teacher workforce dataset?

12. Do you have a view as to what body might be the best custodian of a national teacher workforce dataset?
13. What protocols, including in relation to privacy, would be required for your data to be held by such a body?

Other advice

Do you have any other advice for this project?
Are you happy to be contacted again should we wish to collect further information?

Appendix 3: Analysis of stakeholder consultations

Clarity of purpose and focus

AITSL and the Department nominated a range of stakeholders to be consulted on the development of the ideal data framework for ITE, as well as for the Data Framework for the teacher workforce overall. It included state and territory departmental officers, the TRAs, ITE providers and bodies, teacher employer bodies and other education and data collection experts. The list of those consulted is provided in Appendix 1.

In commenting on the draft ideal data framework, stakeholders emphasised the importance of:

- the clarity of purpose for the data collection;
- focusing effort on data items and data gaps that would merit investment of additional effort and cost; and
- establishing the argument for data to be specified, collected and warehoused nationally, noting that each of these matters needs to be considered separately.

Three broad and distinct priority areas for the collection of ITE data and broader teacher workforce data were identified:

- the effectiveness of ITE;
- teacher supply and demand and workforce planning; and
- workforce profiling/benchmarking.

The effectiveness of initial teacher education

ITE graduate quality was of great interest to all state and territory departmental interviewees, and was identified by some as the most important issue for an ideal data framework. Many acknowledged that not all ITE graduates were classroom ready or had achieved the graduate level of the APST. This is consistent with the finding in the recent TEMAG report.

This was attributed by some as resulting from the lack of common, valid and rigorous 'capstone' assessment of ITE students. Two jurisdictions and several ITE providers and experts expressed the view that the introduction of a national approach to such capstone assessments for provisional registration would be welcome. There was no suggestion from anyone consulted that such a development was imminent.

As a result, proxies for the classroom readiness of early career teachers were suggested or acknowledged by a range of departmental officers, ITE providers and expert stakeholders. Employment outcomes were seen as useful, given the reported sharing of intelligence on suitable and unsuitable applicants for teaching positions and on the quality of different ITE providers and programs.

Departmental officers also wanted information in the ideal data framework about student perceptions of how helpful their ITE program was, employer perceptions of graduates' skills against the APST, and other qualitative early teaching

career data. Some of the nominated experts advocated the use of similar proxies, and suggested that they should be collected across the early teaching career period as employment status, location and attitudes change and evolve. These discussions acknowledged the problem of attributing teacher capability to the ITE course as the length of time post-graduation increased. Stakeholders saw an additional benefit of such a data collection. It would enable information to be collected on the quality of early career teacher induction and mentoring, which was acknowledged by a cross-section of those interviewed as critical to the development of early career teachers.

At least one TRA collects data on the duration of professional experience of students in ITE courses from ITE providers in their jurisdiction. Teacher education experts reinforced the importance of the practical placement of ITE students, both in terms of the duration of placements and their quality.

Some ITE providers and TRA stakeholders commented that the strongest focus on teacher effectiveness could come at the point at which teachers seek full registration (proficient on the APST). There was a general acknowledgement, however, that the TEMAG report and the federal government's response argued for the measures in an ideal data framework for ITE focusing on proxies for graduates' classroom readiness.

Looking beyond ITE, there was general acknowledgement by departmental officers that divergent practices are used across jurisdictions to classify teachers at levels beyond 'proficient'. The officers indicated that no useful national data was available on the effectiveness of the broader teaching workforce. This was attributed to the variable adoption of the APST by teacher employers for teacher classification, and the voluntary, inconsistent and perhaps inadequate approaches to such assessments where available. As a result, departmental officers and other teacher employer representatives did not advocate for the collection of national data on effectiveness of the broader teacher workforce.

The lack of good proxies for teacher effectiveness following the early career stage was confirmed in interviews with nominated experts who described available data, such as years of experience and highest qualification, as being unsuitable for this purpose.

Interviews with the TRA confirmed that all data collected for provisional and full registration corresponds to graduate and proficient on the APST respectively. Collection of data at the higher level of the APST, however, is inconsistent across jurisdictions.

Teacher supply and demand and workforce profiling

Almost all departmental officials identified the issue of teacher supply and demand as very important, with the majority undertaking supply and demand analyses and producing associated reports. There was a tendency for smaller jurisdictions to be less sophisticated in their approaches. Priority data gaps in new teacher supply were identified as:

- the extent to which graduates were not registering as teachers, or registering but not teaching;
- the supply of specialist teachers, particularly science and mathematics specialists teachers, including higher-level mathematics;
- the deployment of teachers as employees in rural, remote and hard-to-staff schools, and interstate;
- the deployment of teachers to schooling sectors (government, Catholic, independent) and level (pre-school, primary and secondary) given some ITE courses prepare teachers to teach in more than one of these levels;
- the distinction between ITE provider location and the jurisdiction or location in which the graduate is available to teach, particularly given the rise in online ITE enrolments; and
- the oversupply of teachers, particularly primary teachers, and the associated excessive demand for professional experience placements. This concern was coupled with a strong desire for improved labour market information for potential ITE students.

These data gaps were confirmed by the experts consulted.

In relation to improved information on the supply of specialist teachers, those involved in teacher supply and demand observed that although the course requirements of ITE programs leading to specialisation differ, the collection and reporting of teaching specialisation on a nationally consistent basis would be of great benefit.

The majority of TRAs don't currently collect data on registered teaching specialisation but agreed that that they were well positioned to do so, as recommended by the TEMAG report.

In NSW, where teachers can be accredited with teaching specialisations, this information is collected from ITE providers and recorded by BOSTES. Further qualifications are self-reported by teachers to BOSTES.

In Queensland information on teaching specialisations is requested by QCT and self-reported by teachers as part of the registration process. This does not result in a teacher being registered as a subject specialist. The Queensland approach is similar to the approach taken in Scotland, as described in the box below.

General Teaching Council for Scotland and professional registration in subject areas

The General Teaching Council for Scotland (GTCS), established in 1965, was the first professional registration body for teachers in the United Kingdom and, according to their website, one of the first TRAs in the world. In addition to maintaining the register of teachers eligible to teach in Scotland's local authority schools, the GTCS also sets the professional standards expected of all teachers and reviews and accredits all programs of ITE.

Through the GTCS, teachers at both primary and secondary schools who have been teaching for at least one year since obtaining full registration can gain professional registration in different subject areas or sectors. Evidence of certification from the ITE provider is accepted by the GTCS in determining whether a teacher has met the appropriate requirements to teach a specific subject. The applicant submits evidence of academic study in the form of their degree certificate, which may indicate their subject specialisation, and an academic transcript.

The GTCS maintains a publicly accessible, online register of all teachers authorised to teach in Scotland, detailing their current registration status, their fitness to teach and their last known employer (by local government authority). The register provides information on whether the teacher is qualified to teach at primary or secondary level and, at secondary level, their subject specialisation. This register of teachers can also be accessed by local government authority employers via a secure login.

Further information is available at: http://www.gtcs.org.uk/home/home.aspx

Beyond the ITE and initial early career teaching stages of teaching, additional areas were identified in which the data for teacher supply and demand modelling could be greatly improved:

- teacher employment and attrition across the schooling sectors;
- apparent attrition arising from teacher name change;
- 'out-of-field' teaching across the schooling sectors;
- casualisation of the teaching workforce and the use of casual relief teachers; and
- the size and intentions of the potential teaching workforce – that is, registered teachers not currently teaching.

The MATSITI representatives stated that improved supply and demand data on Aboriginal and Torres Strait Islander teachers was critical if there is to be progress on the Ministerial undertaking that teacher workforce would reflect more closely the profile of the student population. Their research has established very distinct patterns of Aboriginal and Torres Strait Islander teacher supply and demand and distinct factors underlying these patterns. Other stakeholders emphasised this point and extended it to a need to ensure diversity in the teaching workforce, and in the pool from which individual schools can select teaching staff.

TRAs were identified as a potential source of data to improve information of the employment status of teachers. TRAs vary in the extent to which they currently collect this data. Under their legislation, the QCT collects data on the employment status of all registered teachers in Queensland annually from teacher employers. In NSW, BOSTES collects employment data on registered teachers from the largest employer in that state, the Department of Education, and is negotiating with the Catholic sector for a similar arrangement. Some of the other TRAs collect self-reported employment data from teachers. Whilst other TRAs don't collect this data, they speculated that they could, given the requirements for a specified number of 'professional practice days' to be undertaken by teachers to obtain and maintain teacher registration.

TRAs were nominated by a cross-section of the stakeholders consulted, including many TRAs themselves, as providing the most obvious platform for improved data collection for both teacher supply and demand and for the effectiveness of ITE. This view was confirmed as being based on the fact that the TRAs hold the most complete and current dataset on teachers in every jurisdiction, and the ongoing contact they have with all registered teachers through registration and re-registration processes and other process to discharge responsibilities under their respective legislation.

Commentary on how such an expanded role could be achieved focused on necessary changes to legislation governing the operation of TRAs, the cost associated with an expanded role, and protocols for data sharing and related privacy requirements which would need to be put in place.

The frequency with which departments undertake teacher supply and demand modelling differs significantly, with one jurisdiction undertaking the exercise more than once a year and others once every few years based on the view that supply and demand are "fairly stable." This difference in approach has implications for the frequency with which a nationally coordinated data collection might occur, as opposed to the data updates a jurisdiction may seek in the intervening period.

Expert commentary on this point suggested an annual data collection cycle for newly registered and early career teachers, with a three year collection cycle for the broader teaching workforce, as is the case for the SiAS survey.

Across all stakeholder groups consulted, the need to provide potential ITE students with access to better data on the labour market for teachers was a prominent concern.

The usefulness of NTWD and SiAS data

The NTWD contains a standardised set of teacher workforce data, mostly 2012 data and primarily collected from teacher employer and teacher regulatory bodies. Reports, released data and the capacity to interrogate the full NTWD dataset have been available since 2014. Detailed information on the NTWD is available in Appendix 7.

Departmental officers and experts engaged in teacher supply and demand modelling were asked about the usefulness of the NTWD for this work and for teacher workforce profiling and benchmarking. The strong consensus of those interviewed was that the data:

- lacked richness as a result of national standardisation and did not reflect processes in individual jurisdictions. Departments who engaged in modelling teacher supply and demand used alternative local data sources;
- was of uncertain quality arising from the variable quality of the environments from which the data was sourced and the lack of shared knowledge about them;
- suffered from significant data gaps, particularly on employment of non-government school teachers; and

- was too dated by the time it became available.

Ernst and Young is the custodian of the NTWD data. The representative interviewed for this project confirmed receiving few requests for access to the NTWD data they hold.

Departments engaged in teacher supply and demand work indicated that they would continue to use local administrative data for this purpose, even if data to address the above data gaps were available, given the light it sheds on jurisdiction-specific matters, for example prevalence and patterns of sick leave.

Whilst the NTWD data were described as of some value for benchmarking purposes, the majority of departmental officers expressed a strong preference that the exercise to produce the NTWD not be repeated.

The SiAS survey has run every three years since 2007, most recently in 2016. It collects data from teachers and school leaders, including on attitudes and intentions to teaching. Details on the SiAS can be found at Appendix 6.

It was described by departmental respondents as of "some use" for filling in teacher effectiveness, teacher supply and demand and benchmarking data gaps, but suffered from issues of:

- sample size, response rates and reliability, particularly in smaller jurisdictions; and
- being limited to certain teachers employed in schools, and therefore excluding those registered but not teaching and those employed on any basis where they were not employed for a full school term at the time of the survey.

It should be noted that those interviewed distinguished between the usefulness of the SiAS data and the information the survey sought to collect. The information sought through the SiAS and the questions framed to collect it were endorsed as appropriate. This is not surprising given that the survey is overseen by AEEYSOC's Data Strategy Group, which includes senior officers responsible for data and analysis from each state and territory in its membership.

TRAs confirmed their limited use of the NTWD and SiAS, with some noting that their role was limited to that of data source for the NTWD, and others who produce teacher workforce profiles indicating the NTWD and SiAS were of some use for national benchmarking. The ITE providers interviewed made little use of either the NTWD or SiAS.

Most departments reported undertaking their own teacher surveys on topical interests that were:

- outside the three-year SiAS cycle;
- looking at issues of interest to the particular jurisdiction or in depth, for example effectiveness of local teacher induction and professional development programs; and
- linked to an overall survey strategy beyond the teaching workforce, for example a survey of students linked to a survey of teachers.

It was stated that such jurisdiction-based surveys would continue and that there was a need to minimise respondent burden, including in relation to the possible implementation of the ideal data framework. Similarly, some TRAs reported conducting surveys of registered teachers consistent with their legislated functions. An example was the 2014 survey of teachers in their first year of teaching post-registration by QCT.

Data sharing with TRAs

Consistent with the observation of stakeholders that TRAs are best placed as a platform on which to improve the quality of data on ITE, recommendation 37 of the TEMAG report recommends that "teacher regulatory authorities share data to inform a national workforce dataset and contribute to national workforce planning."

Data sharing between education departments and TRAs is already occurring to varying extents in several states and territories, enabled by legislation. In the other jurisdictions there was a reasonable degree of support for such data

sharing as a forward development by both department officers and TRA representatives. In one state, the overlap in information of interest to the Department and the TRA is such that scoping discussions are underway for the development of a common online portal for use by teachers.

Alongside these sentiments, several of the TRAs consulted stated that any expansions of data sharing arrangements would need supporting TRA legislation and to be compliant with privacy legislation. The Ernst and Young representative responsible for the establishment of the NTWD, including developing the protocols and agreements that enabled access to TRA data, advised that the time and effort involved in creating this capacity should not be underestimated.

The pre-registration of ITE students is also recommended in the TEMAG report for the purposes of early induction into the teaching profession and improved access to data from the commencement of study in an ITE course. Currently such pre-registration is only required in Tasmania and in relation to students at the University of Tasmania.

There was a degree of support for the introduction of pre-accreditations from ITE providers, TRA representatives and departmental officials and other experts. The Council of Deans of Education has articulated its support for the pre-registration of ITE students.

The consultations on pre-registration focused on the merits of early induction into the teaching profession and providing early signals to ITE students regarding the importance of being a 'fit and proper person' to teach, along with an efficient approach to passing this requirement (for example, Working with Children check). The benefit of pre-registration for the purposes of creating a unique teacher identifier from commencement of an ITE program was secondary, in the view of those consulted. The advice stakeholders provided encompassed the implementation issues, including costs, who would be asked to cover them and, if it were the ITE student, the equity considerations arising.

Despite this view of pre-registration, a cross-section of stakeholders interviewed strongly supported the development of a unique teacher identifier as fundamental to improving the quality of data both on ITE and for the broader teaching workforce. Expert opinion was definite and positioned the creation of such an identifier as the single most important innovation to be achieved from the current project, and that its creation should not be tied to a decision on pre-registration. This view was linked to the strongly held view that the data collected should be at the individual teacher level to provide for analyses at desired levels of aggregation and disaggregation, for example, at the level of the accredited ITE program for assessment of ITE effectiveness and at the level of teaching specialisation for supply and demand modelling.

The divergent approach of TRAs to registration, renewal of registration and other practices and the not yet completed coverage of the teaching workforce in some jurisdictions were raised in stakeholder interviews. The implication of these divergent practices will need to be resolved if the TRAs and their data are to be central to improved data collection. These issues are addressed in a later section.

The collection and warehousing of ITE and teacher workforce data

In consultations with all stakeholders interviewed, the issues of respondent burden and the cost of data collection were very prominent. Stakeholders stated that any additional data proposed for collection would need to provide significant benefit and that the strategies for collection should minimise respondent burden.

There was an acknowledgement that cross-jurisdictional issues of teacher supply and demand raised strong arguments for nationally consistent data to fill priority data gaps. The examples provided included:

- jurisdictions where a significant proportion of the employed teachers were ITE graduated in other states – this was stated to be the case for the Northern Territory;
- the operation of ITE providers across borders; and
- the trend in applicant numbers for ITE programs being highly variable in different states, underscoring the national nature of the teacher labour market for teachers.

On data warehousing, consultation with departmental officers indicated that governance arrangements, data capacity and stability would be critical to a decision regarding a suitable data custodian for nationally held data. ACARA was cited by several jurisdictions as fitting these criteria.

A cross-section of stakeholders emphasised the sensitive nature of the data nominated for collection, particularly given the strong preference that data be collected at the individual teacher level and the nature of the analyses that can be performed on such data to compare between schools, schooling sectors and jurisdictions. The protocols required to operate in relation to a data warehouse of ITE and teacher workforce data would need to address these concerns.

The NTWD exercise was frequently cited by both departmental officers and TRAs and others involved in its establishment as providing a successful model of data sharing, access and release. The benefits were described both in terms of the specific protocols developed and the legacy of knowledge in key stakeholders and positive relationships between them.

Appendix 4: Review of literature – ITE and the teacher workforce data

Approaches to the collection and reporting of ITE and teacher workforce data in three federal jurisdictions: Germany, Canada and the USA

Introduction

Countries with federalist systems of government such as Australia face particular challenges in managing their schooling systems. These difficulties extend to ITE and to teacher workforce data collection. States within a federation may have different legislation, schooling structures and policy settings which can present challenges in establishing a centralised repository of data. Federated states are subject to similar imperatives to collect and use such data, but their approaches to this collection and use differ, reflecting the roles and responsibilities of the levels of government, and the organisation of schooling within member states. The approaches taken to ITE and teacher workforce data collections and use in three other countries with federalist systems of government – Germany, Canada and the United States – are described below.

Germany

Germany's school system is segmented, with various types of lower and upper secondary schools operating in the 16 different states. In some states, students as young as 10 are streamed into rigid academic or vocational pathways. In others, comprehensive schools educating a wide range of students dominate provision. Responsibility for ITE rests with each of the 16 states. Each state regulates its own teacher training arrangements and the associated study and examination requirements (KultusMinisterKonferenz (KMK) 2014). The way in which schooling is organised has an impact on ITE. ITE students choose from six types of ITE programs and careers. Their choice is guided by the type of school in which they seek to find a teaching position, for example in a primary school, vocational school, or in a university entry preparatory school.

The national government has overall responsibility for assessing teacher supply and demand in Germany. Biennially, each state provides the federal government with estimates of teacher demand for each of its school types, and with an estimate of the number of ITE students who will complete an ITE course for each school type, based on the number of ITE students forecast to complete the second (and final) state examination that occurs at the end of teaching training. The federal government uses this information to model teacher supply and demand and the flows of early career teachers into each teaching pathway. This information is published nationally and for the former West and East regions. No supply and demand estimates are publicly available at the state level (Statistische Veröffentlichungen der KMK 2015).

Projections suggest that demand for teachers will be difficult to meet in coming years. Recently the demand-side factors have become particularly pressing with the intake of refugees. Some reports suggest that up to 10,000 new additional teachers will need to be hired for the next school year (Knowles 2015).

A national longitudinal survey of ITE students is being undertaken in Germany. The survey has been implemented as an additional element to the National Educational Panel Study (NEPS), a substantial investment in collecting longitudinal data across all state education systems (Leibniz Institute for Educational Trajectories 2015). Cohort 5 of NEPS includes

first-year students drawn from different areas of study in higher education. The survey will follow graduates as they complete their studies and move into their professional careers. 5,500 students from ITE courses were surveyed in the initial wave of Cohort 5 in 2010–2011. These ITE students are now part of an additional study running from 2014–2017 called the Lehramtsttudierendenpanel, or the Panel of Teacher Education Students.

The Lehramtsttudierendenpanel is collecting qualitative information regarding students' motivations to teach, beliefs regarding teaching and learning, views of their ITE course and professional preparation, and self-evaluation of their professional competence, as well as employment destinations. The survey responses from the Panel of Teacher Education Students study will eventually form a comprehensive national database. This database will be available to researchers and policymakers, enabling insight into the perspectives of ITE students from various states and their destinations in the wider teaching workforce (Leibniz Institute for Educational Trajectories 2015).

The calculation of teacher supply and demand has emerged as a priority in the collection of teacher workforce data across Europe. Some European countries have undertaken national surveys, studies and research to enhance understanding and insight into emerging trends and potential challenges (Eurydice 2015). As part of the European Union, Germany supplies aggregate data about its teaching workforce to European central reporting agencies such as Eurydice. The aggregate data supplied is very broad, with no detailed teacher perception or insight data made available. No data concerning ITE outcomes is available at the EU level. European reports that seek to analyse trends in the teacher workforce often use datasets such as the OECD's TALIS that surveys principals and teachers (Eurydice 2015). TALIS provides an interesting international comparative perspective. Its use is limited, however, as it is a cross-sectional sample survey of teachers and school leaders at the lower secondary level only.

Canada

In Canada there is no federal education ministry or federal education policy frameworks. Statistics Canada has data collections relevant to education and teacher workforce. As part of its overall responsibility for schooling, each province administers its own ITE courses and teacher regulatory bodies. Each Canadian province mandates its own approach to teacher workforce data collection. Provinces provide aggregated data to Statistics Canada, which then makes it available for public dissemination. The Elementary-Secondary Education Survey (ESES) reports in broad terms on enrolments, graduates, educators and finances of Canadian elementary-secondary public and private educational institutions. Information supplied by provinces about educators relates to employment status (full-time or part-time), age group and sex. The aim of ESES is "to meet policy and planning needs in the field of elementary-secondary education" (Statcan 2015).

Ontario

In Ontario, the teacher regulatory body, the College of Teachers, runs the longitudinal Transition to Teaching study, which surveys a sample of ITE students graduating from its universities and US border colleges (Ontario College of Teachers 2014). The survey is a random sample of all ITE graduates who register with the College of Teachers to be able to work within schools in Ontario. Teachers graduating from ITE are surveyed every year after graduation for five years, and then at again at year 10. In the first two years following licensure, survey subjects are asked questions about teaching employment, views on teacher education, professional development, career plans, reflections on teaching and demographics. Surveys beyond the second year ask for employment updates, teaching experience, career plans, reflections on teaching and demographics (Ontario College of Teachers 2014).

The College of Teachers reports on the findings annually. The data is not publically available. The limitation of this approach to data collection is that the survey is not a census, so it cannot provide a picture of the entire workforce. In 2014, 18,005 individuals were invited to participate in the survey across all graduate years (2013, 2012, 2011, 2010, 2009 and 2004) with an overall return rate of 22 per cent (Ontario College of Teachers 2014).

Alberta

The province of Alberta inaugurated a new teacher registry system in 2014. One function of the new system is as a resource for the state to be able to collect "more comprehensive and accurate employment data to support workforce planning and analysis" (Alberta Education 2015). As a primary function, the system will ensure the appropriate certification of all teachers. The Teacher Workforce Information System (TWINS) will draw in data collected from teachers via the self-service function, which has been introduced to make it easier for teachers to pay application fees to the teacher registration authority and receive certification. The self-service function enables teachers to update their personal details, input their ITE program type, record their further professional training and provide the opportunity for individuals to self-identify as First Nations, Métis or Inuit.

The provisional Interim Professional Certification granted in Alberta is valid for three years. When teachers have taught for a minimum of two years in schools, they obtain a recommendation for Permanent Certification if their teaching practice consistently meets the standards outlined in the Teaching Quality Standard Ministerial Order (Alberta Education 2015). Teachers who are applying for Professional Certification in Alberta (both interim and permanent) can only do so through the online TWINS system.

All school authorities in Alberta, including public, separate, charter, private and band schools, input data into TWINS. School authority data submitted to the system includes information about individual teachers such as their start and end date of employment, departure reasons, grades taught, contract type, salary, absences and leave. Alberta's ITE institutions provide TWINS with a list of graduates from their Bachelor of Education programs, including of their areas of specialisation. The data collected is secured and protected by Alberta Education, and is stored in a corporate data warehouse. Protocols adhere to Alberta's privacy laws. Use of the data collected through Alberta's new teacher registration arrangements, including data linkage at the individual level between datasets, is in its early stages. It will be used in aggregate form by the Alberta Education Ministry and school authorities in workforce planning and development (Alberta Education 2015).

USA

The US federal government is more active in the collection of ITE and teacher workforce data than its counterparts in Germany and Canada.

There is a mandated national collection of ITE data as stipulated in Sections 205–208 of Title II of the US *Higher Education Opportunity Act* (2008). Each state is required to report annually on ITE programs and on requirements for initial teacher credentialling for kindergarten through to 12th grade (United States Department of Education 2013). While Title II reporting is required by law, the method of gathering this information is decided on by each state (United States Department of Education 2013). The federal government has developed an online tool called the Institutional and Program Report Card (IPRC). If the state elects to use the IPRC, then all ITE programs (both higher education and non- higher-education-based) must also report to their state using this tool.

The information required to be supplied about every ITE course within each state includes the following elements:

- the number of students enrolled in each teacher preparation program by gender, race, and ethnicity;
- the number of hours required prior to student teaching and for student teaching and the number of faculty and prospective teachers participating in each teacher preparation program;
- the number of teachers prepared by credential area, academic major, and subject area;
- a description of the reliability and validity of teacher credential assessments and requirements;
- a description of each state teacher credential and the requirements to obtain each credential;
- a description of state teacher standards and the alignment of the standards with assessments for teacher credentials and state academic standards;
- the institutional and state pass rates of traditional and alternative route program completers on assessments required for credentials, including the minimum passing score;

- a description of criteria for determining low-performing teacher preparation programs and a list of any teacher preparation programs that the state identified as low performing;
- a description of the extent to which teacher preparation programs addressed shortages of highly qualified teachers;
- a description of the extent to which teacher preparation programs equipped teachers to teach students with disabilities and students who have limited English proficiency;
- a description of the extent to which teacher preparation programs equipped teachers to integrate technology into curricula and instruction; and
- a description of steps the state has taken to improve teacher quality during the past year.

(United States Department of Education 2013)

The national collection of information concerning ITE provision in each state is designed to "provide Congress, aspiring teachers, the education community, researchers and policymakers, and the general public with information that Congress has identified as important to a basic understanding of teacher preparation in America" (United States Department of Education 2013). The collected data was previously collated into a report which had a second section comprised of individual state 'snapshots', but from 2014 all data has been available in an interactive form on a publically accessible and easy to use website: https://title2.ed.gov/Public/Home.aspx.

Some states have developed ITE and teacher workforce data collection arrangements which meet and exceed these national reporting requirements, and are actively engaged in the process of linking state databases relating to teacher registration, ITE course providers and school districts. The national not-for-profit Data Quality Campaign has been a champion of these initiatives and promotes policies involving states working towards cohesive and sensible data strategies. The Campaign calls for "states to move from collecting data only for compliance and accountability purposes to using data to answer critical policy questions, inform continuous improvement, and ultimately, support students on their paths to success" (Data Quality Campaign 2015, p.4). The organisation is funded by philanthropic organisations, including the Bill and Melinda Gates Foundation. It releases reports of national significance benchmarking each state against 10 actions identified by the Campaign as necessary for effective data use (Data Quality Campaign 2015).

The United States Federal Government also provides funding grants and resources for states to set up statewide longitudinal data systems to improve student achievement. The National Forum on Education Statistics provides resources which set out the basic features of a longitudinal data system in step-by-step guides for states to follow. A national longitudinal data system links data collected from various agencies in a way that protects privacy. The protection of privacy necessitates a unique teacher identifier to sit alongside unique student identifiers (National Forum on Education Statistics 2010). Teacher data systems require the capture of information such as education, experience and training, and the ability to track teachers who move in and out of school districts. Student data involves achievement and standardised testing data, attendance and courses taken at school. State longitudinal data systems can respond to legislation such as *No Child Left Behind* and *Race to the Top*, which ask states to measure and quantify the impact of education reforms partly through "matching teachers to students by classroom and subject' regarded as 'critical to understanding the connection between teacher training and qualifications and student academic growth" (National Forum on Education Statistics 2010, p.18).

Kentucky

Kentucky is an example of a state with best practice in terms of cross-institutional data warehousing. The Kentucky Center for Education and Workforce Statistics (KCEWS) was created in 2012 and has the authority to collect and link data to evaluate education and workforce efforts. The Kentucky Longitudinal Data System is housed in this Centre and was developed through a grant provided by the United States Department of Education's Institute for Education Sciences Statewide Longitudinal Data Systems program. The agency matches the data from various systems including the Education Professional Standards Board, the Council of Postsecondary Education, the Kentucky Department of Education and the Kentucky Unemployment Insurance System (KCEWS 2014). As their website states, each education

agency has “developed data systems that serve the needs of their own agency within the limits of the data they possess.” The connection of this data can mean that policymakers are enabled to “address the strengths and weaknesses of the educational pipeline and our programs like never before” (KCEWS 2015).

Once matched in the Kentucky Longitudinal Data System, all personal information such as name and social security number are removed even for the highest-level user. The database has over 1,000 individual elements across various sources. KCEWS publishes annual reports on ITE including data from all in-state four-year public and independent colleges and universities, including their enrolments, rates of retention, whether graduates were employed in state or outside, the school district in which they teach and how long it took for them to find a position within the K-12 system (KCEWS 2014).

Massachusetts

Massachusetts was a recipient of a $250 million *Race to the Top* grant to adopt reforms in public education in the areas of standards and assessments, great teachers and leaders, school turnaround and data systems. Massachusetts has sought to streamline cross-agency data collection. Massachusetts has an Educational Personnel Information Management System (EPIMS), which collects data from all public school districts and charter schools. The data collected is linked with data from teacher licensing agencies, which is maintained separately in the Educator Licensure and Recruitment database. After consultation, particularly with the school districts, the joint system was rolled out in 2010. The EPIMS enables the districts to meet the requirements outlined in *No Child Left Behind*, but with higher levels of accuracy and comprehensiveness the EPIMS will also inform policy and program decisions (Massachusetts Department of Elementary and Secondary Education 2015).

The Massachusetts education department assigns each educator in the dataset a unique identifier called the Massachusetts Education Personnel ID (MEPID), which “helps ensure data accuracy and integrity and allows the Department to track personnel across districts and over time” (Massachusetts Department of Elementary and Secondary Education 2011). The MEPID also de-identifies individual teachers. Data at all times is securely transmitted through a security portal. EPIMS aggregate data is available on the department’s website, with more detailed data available upon request. Massachusetts is currently working on developing better linkage between the EPIMS and the Student Information management System, so that the state can better understand what is happening in the classroom at the student level and analyse the impact of investments from educator preparation to student instruction.

The state of Massachusetts fulfils all mandated Title II requirements for ITE data collection. The state has subject matter knowledge requirements for teacher licensure which align to their new Professional Standards and that also correspond to the Pearson Educator Evaluation Framework. The standards apply to pre-service and in-service preparation. The state also uses Pearson as an evaluation tool for certain domain-specific teaching qualifications across all ITE programs.

The state has defined its own set criteria to be used to determine whether an ITE program (either traditional or alternative entry) is classified as high or low performing. The criteria include one or more of the following:

- program’s approval status (number of Standards and Effectiveness Indicators met or significance of findings resulting from formal review);
- program completion rate;
- persistence rate;
- state-administered survey results;
- adherence to state reporting requirements;
- school and district partnership data;
- aggregate employment data; and
- aggregate evaluation rating data.

(United States Department of Education 2015)

Programs that are deemed low performing must submit an improvement plan to the Massachusetts Department, which "may monitor progress in meeting the goals of the improvement plan. If, after one year under review, a program has not made satisfactory progress, its approval may be revoked" (United States Department of Education 2015). Currently Massachusetts does not have any programs regarded as low performing or at risk.

Summary

The three countries described above have approached the improved collection and use of ITE and teacher workforce data differently, reflecting their political context and the organisation of schooling within states. Overall it can be said that in response to a common need, all three have progressed significantly in moving towards collecting better data about their teacher workforce and education systems more broadly. The United States has made the most progress, mandating ITE data at national and state levels and encouraging and facilitating longitudinal and cross-agency data systems.

Appendix 5: Lessons from the health professions

National Registration and Accreditation Scheme

The National Registration and Accreditation Scheme (NRAS 2013) commenced operation on 1 July 2010 to create a nationally consistent environment for the regulation of health practitioners in Australia. It was established by state and territory governments through the introduction of consistent legislation in all jurisdictions. The objectives of NRAS are nationally effective strategies in areas of public protection, workforce mobility, delivery of high-quality education and training, assessment of overseas-trained practitioners, facilitation of access to services and development of a flexible, response and sustainable workforce for health and allied services. Professions currently regulated under the NRAS include:

- Aboriginal and Torres Strait Islander health practice;
- chiropractic;
- dental practice;
- medicine;
- medical radiation practice;
- nursing and midwifery;
- occupational therapy;
- optometry;
- pharmacy;
- physiotherapy; and
- podiatry.

Each separate profession has a national board which regulates the profession, registers practitioners and develops standards, codes and guidelines for the profession. The AHPRA administers NRAS and provides administrative support to the National Boards.

Data collection, warehousing and reporting

Data collection, warehousing and reporting arrangements were established through a tripartite agreement specifying the roles and responsibilities of the three parties involved:

- AHPRA registers practitioners and collects data on behalf of the national boards for the health professions;
- AIHW functions as the data warehouses for the health professions and providers agreed data and reports; and
- Health Workforce Australia (HWA), until its termination, undertook workforce supply and demand modelling and workforce planning. New arrangements are now being determined.

The role of AHPRA

AHPRA collects the data on behalf of the national regulatory bodies from two sources: administrative data associated with registration, for example name, date of birth, gender, qualification and endorsements; and survey data.

Registration and renewal occur online[9]. A seamless environment is used to administer the survey at the time of online registration renewal. The questionnaires are brief (five to 10 minutes to complete) and focus on employment status, settings, forward intentions and qualifications. Across all the health professions the response rate was reported by AHPRA officers. The collection of data is strongly supported by professional and representative bodies. HWA provided funding towards the cost of establishing the data collection system.

Data is available for most, if not all, health professions annually as registration renewals are annual. Nurses renew registration with the Nursing and Midwifery Board of Australia (NMBA) in April and May each year. Medical practitioners renew their registration with the Medical Board of Australia in September each year.

Data consistency is supported by:

- the linking of practitioner surveys to registration renewal;
- collecting the data from all practitioners in a field during a narrow time window; and
- uniform data collection interface and standardised data instruments in each profession.

The collection of data via survey for the purposes of workforce planning is enabled by legislation in Health Practitioner Regulation National Law, enacted in each state and territory as part of NRAS. The legislation for each state and territory can be found at: https://www.ahpra.gov.au/About-AHPRA/What-We-Do/Legislation.aspx.

Consideration may be given to reducing the frequency of survey data collection to reduce respondent burden and maintain high response rates.

The role of AIHW

AIHW is the custodian for data on health practitioners. Datasets are forwarded by AHPRA under a data release protocol as part of the tripartite agreement. The data forwarded have been cleaned of items that could identify individuals. AHPRA supplies a unique practitioner identifier. About 10 discrete datasets are forwarded. The identifier is used to match the data on individual across collections.

AIHW cleans and processes the data to create and maintain the NHWD. Data is forwarded to HWA to undertake workforce planning. The AIHW provides agreed data to the commonwealth and state/territory health departments. Data is provided to researchers under strict protocols.

Linkage of higher education data to the health workforce data held by AIHW using a statistical data key and deterministic data matching is currently being considered. Options for implementation are:

- done by AIHW if possible under current or new legislation; and
- done by AHPRA and by faculty Deans using the same code – if not possible under legislation and no new legislation agreed.

An emergent area of interest is the use of data analytics to interrogate the NHWD to support the regulatory functions of the regulatory boards and other regulatory authorities.

[9] Some paper-based collection is being phased out.

HWA

Data is forwarded to HWA to undertake workforce planning.

> *Health Workforce Australia (HWA) is a Commonwealth statutory authority that delivers a national, coordinated approach to health workforce reform. It was established by the Council of Australian Governments (COAG) to address the challenges of providing a skilled, flexible and innovative health workforce that meets the needs of the Australian community.*
>
> *The health workforce is under tremendous pressure because of an ageing population, growth in chronic disease and increased community expectations.*
>
> *At the same time, there are new challenges including rapidly changing technology; new approaches to training and education; an uneven distribution of the workforce across metropolitan, rural and remote areas; looming shortages in some professions and specialties; entrenched work practices; and constricted professional roles.*
>
> HWA website

Reporting

AHPRA now publishes information about every registered health practitioner in Australia on a single national, and provides quarterly statistical breakdowns about registrants. As a result, it is possible to produce accurate reports on the number of practitioners registered in each profession in Australia.

Nursing students

The NMBA registers nursing students. Students provide the evidence required for registration, including enrolment in a suitable accredited course of study. Their enrolment in accredited programs is checked against enrolment lists provided annually by university nursing providers. A range of administrative data is collected from nursing students at the point of registration. Annual reports are produced on student nursing numbers at the state and territory level, including for workforce planning.

The NMBA is also in receipt of information on student nurses provided by universities under the Health Practitioner National Law Act (Section 230). These data are used for investigative purposes but not placed on the nursing database. When student nurses graduate and are registered as fully qualified nurses, the collection of administrative data is initiated again. No data from the student nursing database is provided to the registered nurses database.

Medical students

Data on the pre-registration education of doctors are collected by the Medical Deans of Australia and New Zealand, the peak body representing professional entry-level medical education, training and research in Australia and New Zealand. Its responsibilities encompass a significant contribution to medical workforce planning. This includes the collection and publication of statistics on basic medical education students including:

- domestic medical students by year of course (annual);
- total medical students by year of course (annual);
- total commencing medical students time series 2002 onward;
- domestic medical students time series 1996 onward; and
- international medical students time series.

The latest annual figures are available in the final quarter of each year. Statistics comprise Annual Tables, which consist of university-by-university frequency tables on enrolment and graduation statistics, and snapshots that provide more detailed information on specific areas of interest, such as gender, Indigenous medical students and rurality, amongst others. These data are institution-based, de-identified and cannot be traced to individual medical students.

In addition the Medical Schools Outcomes Database and Longitudinal Tracking (MSOD) project tracks students through medical school into pre-vocational and vocational training and then into employment and other areas. The MSOD Project administers questionnaires to medical students in their commencing and final years of medical school, in the PGY1/Intern year, and also collects information regarding participants' electives, placements and enrolment status from medical schools. It aims to inform understanding of student and workforce needs and policy, especially in increasing numbers of general practitioners in rural locations.

The MSOD Project tracks participating individual medical students longitudinally, whereas the Medical Deans collect data for the entire medical student population but cannot track individual students.

Appendix 6: Staff in Australia's schools teacher questionnaire

The teacher questionnaire for the 2012 SiAS survey is attached.

TEACHER SURVEY

Notes in green identify conditions in use to filter questions

YOUR BACKGROUND

1. Please indicate your age as of May 1 this year: _____ **years** _____ **months**

2. Are you male or female? ○ Male ○ Female

3. Do you identify as being of Aboriginal or Torres Strait Islander origin?

- ○ No
- ○ Yes, Aboriginal
- ○ Yes, Torres Strait Islander
- ○ Yes, both Aboriginal and Torres Strait Islander

4. In which country were you born?

- ○ Australia
- ○ Canada
- ○ Germany
- ○ Greece
- ○ India
- ○ Italy
- ○ Malaysia
- ○ New Zealand
- ○ Republic of Ireland
- ○ South Africa
- ○ United Kingdom
- ○ United States of America
- ○ Other *(please specify)* _____

Please answer Question 5 only if you were not born in Australia.

5. For how many years have you lived in Australia? _____ *years*

6a. Do you speak a language other than English at home?

○ Yes — Continue to Q6b
○ No — Go straight to Q7

6b. What is that language? _____

6c. How good is your spoken English?

○ Very good
○ Good
○ Satisfactory

YOUR PREPARATION FOR TEACHING

7. At what stage of your life did you first decide that you wanted to become a teacher?

○ While at school
○ During my first degree program at university
○ Upon completing my first degree
○ While in employment
○ Other (please describe) _____

8. Was your initial teacher education program

○ a graduate program (requiring a first degree as a prerequisite for entry?
○ an undergraduate program?

9. Was the institution from which you gained your initial (preservice) teacher education qualification located in:

a.
○ New South Wales?
○ Victoria?
○ Queensland?
○ Western Australia?
○ South Australia?
○ Tasmania?
○ Australian Capital Territory?
○ Northern Territory?
○ Overseas? (please specify the country) _____

b. A capital city?

○ Yes
○ No

10. What is the level of the highest qualification you have *completed* in a field other than Education? (This may include degrees in Arts, Science, Commerce, etc. that you completed before or after entering your teacher preparation program.)

P*lease tick one box only.*

Graduate programs:

- ○ Doctoral degree
- ○ Masters degree
- ○ Graduate Diploma
- ○ Graduate Certificate
- ○ Bachelor (Honours) degree

Undergraduate Programs:

- ○ Bachelor degree
- ○ Other *(please specify)* _____

Neither

- ○ I have no formal qualifications outside education.

11. What is the level of the highest qualification you have *completed* in the field of Education?

Please tick one box only.

Graduate programs:

- ○ Doctoral degree
- ○ Masters degree
- ○ Graduate Diploma
- ○ Graduate Certificate
- ○ Bachelor (Honours) degree

Undergraduate Programs:

- ○ Bachelor degree
- ○ Other *(please specify)* _____

12. a. In what year did you commence your initial teacher education program? _____

b. In what year did you complete your initial teacher education program? _____

c. In what year did you take up your first appointment as a teacher? _____

d. For how many years have you been teaching in total (counting this year as one)? _____ years

If your answer to Question 12d is five years or less, continue with Question 13 through 17; otherwise go straight to Question 18.

13. Which of the following factors were important to you in your decision to become a teacher?
Please tick all boxes that apply.

a.	Love of teaching	☐
b.	Love of subject	☐
c.	Encouragement from teacher(s) while you were at school	☐
d.	Family role model(s)	☐
e.	Availability of employment	☐
f.	Attractiveness of the salary	☐
g.	Working conditions	☐
h.	Security of employment	☐
i.	Holidays, hours of work	☐
k.	Desire to contribute to society	☐
l.	Desire to work with young people	☐
m	Status of the teaching profession	☐
n.	Other *(please specify)* _____	☐

14. Which of the following was part of the application process for selection into your initial teacher education program?
Please tick all boxes that apply.

a.	Academic achievement in school (e.g. ATAR, ENTER, UAI, etc.)	☐
b.	Academic achievement in a university degree	☐
c.	Academic achievement in other post-secondary studies (e.g. TAFE)	☐
d.	Specific test results	☐
e.	A written submission	☐
f.	References	☐
g.	Evidence of previous experience in working with children	☐
h.	Evidence of work experience not specifically connected to teaching	☐
i.	An interview	☐
j.	Other (please describe) _____	☐

15. How helpful was your initial teacher education course in preparing you for: (*please tick one box in each row)*

		Not helpful	Of some help	Helpful	Very helpful
a.	Teaching students with a wide range of backgrounds and abilities	○	○	○	○
b.	Teaching Aboriginal and Torres Strait Islander students	○	○	○	○
c.	Supporting students with disabilities	○	○	○	○
d.	Developing and teaching a unit of work	○	○	○	○
e.	Developing subject content knowledge appropriate for school curriculum	○	○	○	○
f.	Developing strategies for teaching literacy	○	○	○	○
g.	Developing my own literacy skills	○	○	○	○
h.	Developing strategies for teaching numeracy	○	○	○	○
i.	Developing my own numeracy skills	○	○	○	○
j.	Making effective use of Information and Communication Technology (ICT)	○	○	○	○
k.	Learning about resources available for my teaching areas.	○	○	○	○
l.	Developing my skills in classroom communication	○	○	○	○
m	Learning how to your evaluate and improve my own teaching	○	○	○	○
n.	Involving parents/guardians in the educative process	○	○	○	○
o.	Managing classroom activities to keep students on task.	○	○	○	○
p.	Dealing with difficult student behaviour	○	○	○	○
q.	Making effective use of student assessment information	○	○	○	○
r.	Ensuring that my assessments are consistent and comparable with those of other teachers	○	○	○	○
s.	Interpreting achievement reports from national or state-wide assessments	○	○	○	○
t.	Meeting my professional and ethical responsibilities as a teacher	○	○	○	○
u.	Complying with legislative, administrative and organisational requirements	○	○	○	○
v.	Developing contacts with professional teaching networks	○	○	○	○
w	Engaging with performance and development plans	○	○	○	○

16. How helpful did you find each of the four components of your initial teacher education course listed below in preparing you for teaching? (P*lease tick one box in each row. Answer "Not applicable" if the component was not included as a part of your teacher education course)*

		Not helpful	**Of some help**	**Helpful**	**Very helpful**	**Not applicable**
a.	**Subject studies:** Learning the content of the subjects that you are likely to teach.	○	○	○	○	○
b.	**Teaching methods:** Learning how to teach the subjects that you are likely to teach.	○	○	○	○	○
c.	**Education studies:** Learning about the theories and context of education and schooling.	○	○	○	○	○
d.	**School experience:** Time spent in schools on teaching rounds, observation of classes, practicum and the like.	○	○	○	○	○

17. Since you began teaching, which of the following types of assistance have you been provided with by your school or employer, and how helpful were they?

For types of assistance that you did not receive, please tick "Not Applicable."

	How helpful was the assistance?				
	Not helpful	**Of some help**	**Helpful**	**Very helpful**	**Not Applicable**
An orientation program designed for new teachers	○	○	○	○	○
A designated mentor	○	○	○	○	○
A reduced face-to-face teaching workload	○	○	○	○	○
Follow-up from your teacher education institution	○	○	○	○	○
Structured opportunities to discuss your experiences with other new teachers	○	○	○	○	○
Observation of experienced teachers teaching their classes	○	○	○	○	○
Other assistance *(please specify)* _____	○	○	○	○	○

YOUR CURRENT POSITION

18. Is your current employment arrangement as a teacher:

○ On-going/Permanent
○ Fixed-term/Contract less than 1 year
○ Fixed-term/Contract 1– 3 years
○ Fixed-term/Contract more than 3 years
○ Casual/Relief (on call)
○ Casual/Relief (continuing appointment)

19. Is your current employment as a teacher full-time or part-time?

○ Full-time
○ Part-time *(please specify the time fraction; eg, 0.5 for half-time)* _____

20. Which of the following best characterises your position in the school? *(please tick one box)*

○ Mainly classroom teaching
○ Mainly managing an area or department in the school
○ Mainly providing specialist support to students
○ A combination of classroom teaching and management

21. To the nearest thousand dollars, what is your current annual salary?

Please refer to your gross (i.e., before tax) salary. If you work part-time, please express as a full-time equivalent salary.

$ _____ thousand

22. In a typical week, please estimate the number of hours that you spend on each of the following school-related activities for this school.

(This question concerns your work for this school only. Please do not include any work you may do for other schools or employers.) Please write a number in each row and round to the nearest hour

Teaching of students in school (either whole class, in groups or individually)	_____
Working as an individual on planning work or preparing lessons (including marking of student work)	_____
Working collaboratively with colleagues, including planning, assessing and mentoring	_____
Engaging with performance and development plans	_____
Administrative duties either in school or out of school (including school administrative duties, paperwork and other clerical duties you undertake in your job as a teacher)	_____
Engaging professionally with parents/carers and the community	_____
Other (please specify)_____	_____
Total hours spent on school-related work in a typical week:	_____

23. Has your school teaching experience been at

- ○ the Primary level only?
- ○ the Secondary level only?
- ○ both Primary and Secondary levels?

Skip 24 and 25 if answer 'secondary' to 23

24. Please indicate if you

currently teach as a generalist Primary teacher	○ Yes	○ No
have previously taught as a generalist Primary teacher	○ Yes	○ No
have completed a tertiary course that qualifies you to teach as a generalist Primary teacher	○ Yes	○ No

If not currently a primary teacher, skip 25b

25. a. How many years' experience do you have in generalist primary teaching? _____

b. As a primary teacher responsible for a single class, please indicate the number of students usually in that class: _____

YOUR QUALIFICATIONS AND EXPERIENCE

26. Below is a list of subject areas. Please tick every subject for which at least one of the following applies:

- You are currently teaching the subject (at secondary or as a primary specialist)
- You have previously taught this subject
- You have completed at least one semester of tertiary studies
- You have completed tertiary studies in methods of teaching
- You have completed professional development studies

Language
- English ☐
- English as a Second Language ☐
- Literacy ☐
- Languages other than English: ☐

Mathematics
- Mathematics ☐
- Statistics ☐
- Numeracy ☐

Sciences
- Biology ☐
- Chemistry ☐
- Earth sciences ☐
- Environmental sciences ☐
- Physics ☐
- Psychology/Behavioural studies ☐
- Science – General ☐

The Creative and Performing Arts
- Visual Arts ☐
- Dance ☐
- Drama ☐
- Media Studies ☐
- Music ☐

Society and Environment Studies (SOSE)
- Accounting ☐
- Business studies ☐
- Civics and Citizenship ☐
- Economics ☐
- Geography ☐
- History ☐
- Legal studies ☐
- Politics ☐
- Religious studies ☐
- Social studies ☐

Health and Physical Education
- Health ☐
- Outdoor education ☐
- Physical education ☐

Technology ☐
- Computing ☐
- Food technology ☐
- Graphic communication ☐
- Information technology ☐
- Textiles ☐
- Wood or Metal technology ☐
- *Other* (please specify): _____ ☐

If LOTE is checked in Q26, respondents will be asked to identify the LOTE from a list provided, which includes Mandarin, Japanese, Indonesian, Hindi and Korean, or by writing in the name of the language.

27a. For each subject checked in Q26, respondents who are or have been Primary teachers will then be asked:

a. If they currently teach the subject as a primary subject specialist.
b. If they have previously taught the subject as a primary subject specialist.
c. If they have completed tertiary studies in methods of teaching the subject.
d. Whether they have undertaken professional development activities in the subject in the last 12 months.
e. The highest level at which they have completed at least one semester of tertiary studies in the subject
f. How many years of experience they have teaching the subject as a primary subject specialist

27b. For each subject checked in Q26, respondents who have been Secondary teachers will then be asked:

a. If they currently teach the subject, and at what level (7/8-10, 11-12).
b. If they have previously taught the subject, and at what level (7/8-10, 11-12).
c. The highest level at which they have completed at least one semester of tertiary studies in the subject (with the Year 1 option distinguishing between one semester completed and two semesters completed).
d. If they have completed tertiary studies in methods of teaching the subject.
e. Whether they have undertaken professional development activities in the subject in the last 12 months.
f. How many years of experience they have teaching the subject
g. How many class groups they are currently teaching at each of years 7/8-10 and 11-12.
h. The average size of the class groups they currently teach at years 7/8-10 and 11-12.

QUALIFICATIONS AND EXPERIENCE IN SPECIALIST ROLES (PRIMARY AND/OR SECONDARY):

28. Please check any of the following specialist roles

- that you currently perform in a school, and/or
- that you have previously performed in a school, and/or
- in which you have completed at least one semester of tertiary studies.

Specialist roles

Library	☐
Special Needs	☐
Learning Support	☐
Behaviour Management	☐
School Counselling	☐
Career Education	☐
Vocational Education and Training	☐

29. For each specialist role checked, respondents will then be asked:

a. If they currently perform that role in their school ○ Yes ○ No
b. If they have previously performed that role in a school ○ Yes ○ No
c. How many years' experience they have in performing that role _____ years
d. Whether they have undertaken organized prof. development activities relevant to that role ○ Yes ○ No
e. The highest level at which they have completed at least one semester of tertiary studies for that role:
○ First year ○ Second or third year ○ None

PROFESSIONAL LEARNING ACTIVITIES

Professional learning activities refer to structured activities intended to develop your knowledge and skills as a teacher. They include formal activities (e.g. conferences, workshops and courses of study) as well as informal activities (e.g. ongoing involvement in collegial teams, networks and mentoring). The learning activities include both those provided out-of-school and those provided at school.

30. Have you engaged in professional learning activities over the past 12 months?

☐ Yes If yes*:* Please indicate the number of days (full-time equivalent): _____.
☐ No If no go straight to final column in Question 31.

31. Please indicate by checking the appropriate boxes below the areas in which

- **you have undertaken professional learning as part of a tertiary qualification,**
- **you have undertaken professional learning through other activities (organised or self-directed), and**
- **you believe you need more opportunities for professional learning.**

(Check only the boxes applicable to you)

		Yes, I have undertaken professional learning in the past 12 months:		**I need more opportunities for professional learning in this area**
		as part of a tertiary qualification	**through other activities**	
a.	Teaching students with a wide range of backgrounds and abilities	☐	☐	☐
b.	Teaching Aboriginal and Torres Strait Islander students	☐	☐	☐
c.	Supporting students with disabilities	☐	☐	☐
d.	Developing and teaching a unit of work	☐	☐	☐
e.	Developing subject content knowledge appropriate for school curriculum	☐	☐	☐
f.	Developing strategies for teaching literacy	☐	☐	☐
g	Developing my own literacy skills	☐	☐	☐
h.	Developing strategies for teaching numeracy	☐	☐	☐
i.	Developing my own numeracy skills	☐	☐	☐
j.	Making effective use of Information and Communication Technology (ICT)	☐	☐	☐
k.	Learning about resources available for my teaching areas.	☐	☐	☐
l.	Developing my skills in classroom communication	☐	☐	☐
m.	Learning how to your evaluate and improve my own teaching	☐	☐	☐
n.	Involving parents/guardians in the educative process	☐	☐	☐
o.	Managing classroom activities to keep students on task.	☐	☐	☐
p.	Dealing with difficult student behaviour	☐	☐	☐
q.	Making effective use of student assessment information	☐	☐	☐
r.	Ensuring that my assessments are consistent and comparable with those of other teachers	☐	☐	☐
s.	Interpreting achievement reports from national or state-wide assessments	☐	☐	☐
t.	Meeting my professional and ethical responsibilities as a teacher	☐	☐	☐
u.	Complying with legislative, administrative and organisational requirements	☐	☐	☐
v.	Developing contacts with professional teaching networks	☐	☐	☐
w.	Engaging with performance and development plans	☐	☐	☐

32. To what extent have the professional learning activities you have engaged in over the past 12 months improved your capability in the following areas?

Please tick one box in each row.

		No improvement	Slight improvement	Moderate improvement	Major improvement
a.	(List of areas to be derived from the responses to Q30 (all those checked in column 1 or column 2).	○	○	○	○
b.		○	○	○	○
c.		○	○	○	○
d.		○	○	○	○
e.		○	○	○	○
f.		○	○	○	○
g.		○	○	○	○

YOUR CAREER IN TEACHING

33. Have you had any interruptions to your teaching career (e.g., leave, resignation and return)? If so, how many years have you been absent from teaching? _____ years

34. In how many schools have you been employed as a teacher? _____ schools

From the response to Question 34,

If this is the respondent's first school: Go straight to Question 43

If this is **not** the respondent's first school: Continue on to Question 35.

35. For how long did you teach at your first school? _____ years and _____ months

36. For how long have you been teaching at your current school? _____ years and _____ months

37. Where was the first school in which you worked?

- ○ Western Australia
- ○ South Australia
- ○ Northern Territory
- ○ Tasmania
- ○ Victoria
- ○ New South Wales
- ○ ACT
- ○ Queensland
- ○ Overseas (please specify): _____

If your first school was overseas, go straight to question 40

38. Was the first school in which you worked:

- ○ a Government school?
- ○ a Catholic school?
- ○ an Independent school?

39. Was the first school in which you worked located in:

- ○ a capital city?
- ○ a major or provincial city?
- ○ a rural area?
- ○ a remote area?

40. How many years of your employment as a school teacher have been spent:

In your current State/Territory?	_____ *years*
In another State/Territory?	_____ *years*
In another country?	_____ *years*

41. How many years of your employment as a school teacher in Australia have been spent:

In Government schools?	_____ *years*
In Catholic schools?	_____ *years*
In Independent schools?	_____ *years*

42. Which of the following factors were important influences on your decision to join your present school?

Please check as many boxes as apply.

a	Mandated school mobility requirements	☐
b	Dissatisfaction with my former school	☐
c	End of my contract at the former school	☐
d	Better pay and conditions	☐
e	Taking up a promotion	☐
f	More opportunity to teach in my preferred curriculum areas	☐
g	Positive school ethos and values	☐
h	Professional learning opportunities	☐
i	A more convenient school location	☐
j	Other factors *(please specify)* _____	☐

YOUR ACTIVITIES OUTSIDE TEACHING

43. Which of the following best characterises your main activity in the year before you commenced your teacher preparation program?

Please check one box only.

- ○ School student
- ○ Higher education student
- ○ TAFE student
- ○ Home duties (including caring for children)
- ○ Full-time employment
- ○ Part-time employment
- ○ Unemployed
- ○ Other (please specify) _____

44. Have you ever resigned from school teaching to take up another activity?

- ○ Yes — If Yes continue on to Question 45
- ○ No — If No go straight to Question 46.

45. Why did you return to school teaching?

Please tick all that apply.

- ☐ I missed teaching
- ☐ I missed the students
- ☐ I returned from extended travel
- ☐ The other job/activity was not what I had expected
- ☐ Teaching salary is higher than the salary I was getting
- ☐ Teaching working conditions are better
- ☐ Teaching gives more opportunity for personal growth
- ☐ I had changed personal or family circumstances
- ☐ Other (please specify) _____

YOUR FUTURE CAREER INTENTIONS

46. Do you plan to leave teaching permanently prior to retirement?

- ○ Yes — If Yes continue on to Question 47.
- ○ No — If No, go straight to Question 48.
- ○ Unsure — If Unsure, go straight to Question 48.

47. You have indicated that you plan to leave teaching prior to retirement. Please indicate which of the following were important factors in your decision to leave teaching prior to retirement? (Check only the factors that were important influences on your decision.)

I never intended teaching to be a long-term career	☐
I have found that I am not suited to teaching	☐
I was not enjoying teaching	☐
Family reasons	☐
Unsatisfactory relationships with other staff	☐
Better opportunities outside of schools	☐
Superannuation benefits from leaving teaching early	☐
The workload is too heavy	☐
Insufficient support staff	☐
Class sizes too large	☐
I had issues with student management	☐
Insufficient recognition or reward for teachers	☐
The poor public image of teachers	☐
Changes imposed on schools from outside	☐
Dissatisfaction with performance appraisal processes.	☐
Other *(please specify)* _____	☐

48. How much longer do you intend to work in schools? _____ *years* ☐ Unsure

If you intend to leave teaching in less than 3 years, please answer Question 49. Otherwise go to Question 50.

49. Your answer to Question 48 indicates that you intend to leave schools within the next 3 years. What do you intend to do then? *(Please tick any that apply.)*

- ☐ Seek employment elsewhere in Education, but not directly in schools
- ☐ Seek employment outside of Education
- ☐ Take study leave
- ☐ Take extended leave from teaching (12 months or more)
- ☐ Cease active employment
- ☐ Other (please specify) _____

50. Within the next 3 years do you intend to do any of the following?

	YES
Apply for a Deputy/Vice Principal position	☐
Apply for a Principal position	☐
Continue in your current position at this school	☐
Seek promotion in this school	☐
Move to a similar position at another school	☐
Seek promotion to another school	☐
Move to another school sector (e.g, Government to Catholic)	☐
Train to enable you to teach in another subject area	☐
Train to enable you to teach in another stage of schooling	☐
Change from full-time to part-time employment	☐
Change from part-time to full-time employment	☐
Take extended leave (12 months or more)	☐

If you indicated by your answer to Question 50 that you do not intend to apply for a Principal or Deputy/Vice Principal position in the next three years, please proceed to Question 51; otherwise go straight to Question 53.

51. Do you consider yourself to be at an appropriate stage in your career to apply for a Principal or Deputy/Vice Principal position in the next three years?

- ○ Yes
- ○ No

If the answer is "No", proceed to Question 55

52. Which of the following were important factors influencing your decision NOT to apply for a Deputy/Vice Principal or Principal position? *(Please tick any that apply.)*

The time demands of the job are too high	☐
I lack leadership experience	☐
The position requires too much responsibility	☐
I would have difficulty maintaining a satisfactory work/life balance	☐
The salary is not sufficient for the responsibilities	☐
I have not had encouragement and support from colleagues	☐
I have not had encouragement and support from my school leaders	☐
I have concerns with the selection process	☐
I do not have appropriate prior preparation and training	☐
I do not feel confident in my ability to do the job	☐
I want to remain working mainly in the classroom	☐
I have applied unsuccessfully in the past	☐
My personal or family circumstances	☐
Other (please specify) _____	☐

If your answer to Question 50 indicated that you do intend to apply for a Principal or Deputy/Vice Principal position in the next three years, please answer Questions 53 and 54; otherwise proceed straight to Question 55.

53. How important are the following factors in your intention to apply for a Deputy/Vice Principal or Principal position? *(Please tick any that apply.)*

I want challenges other than classroom teaching	☐
I have had encouragement and support from colleagues	☐
I have had encouragement and support from my school leaders	☐
I want to lead school development	☐
I have had successful experience in other leadership roles	☐
I am confident in my ability to do the job	☐
I was attracted by the salary and other financial benefits	☐
I was attracted by the high standing of school leaders in the community	☐
I have had helpful prior preparation and training	☐
I am at the right stage of my career to apply	☐
Other *(please specify)* _____	☐

54. How well prepared do you feel in the following aspects of school leadership? (*please mark one box in each row)*

	Poorly prepared	Somewhat prepared	Well prepared	Very well prepared
School goal-setting and development	○	○	○	○
School curriculum and assessment	○	○	○	○
Change management	○	○	○	○
Managing staff	○	○	○	○
Managing physical resources	○	○	○	○
Managing school budgets and finances	○	○	○	○
School accountability requirements	○	○	○	○
Student welfare and pastoral care	○	○	○	○
Relationships with families and the school community	○	○	○	○
Assessing teacher performance	○	○	○	○
Conflict resolution	○	○	○	○
Time management	○	○	○	○
Stress management	○	○	○	○

YOUR VIEWS ON THE APPRAISAL AND FEEDBACK YOU RECEIVE IN YOUR SCHOOL

55. Concerning the appraisal and/or feedback you have received at this school, to what extent have they directly improved your capability in any of the following areas? *(Please check one box in each row)*

	Not at all	A little	A lot	Have not received appraisal in this area
a. Knowing students and how they learn	○	○	○	○
b. Knowing the content and how to teach it	○	○	○	○
c. Planning and implementing effective teaching	○	○	○	○
d. Creating and maintaining supportive and safe learning environments	○	○	○	○
e. Assessing, providing feedback and reporting on student learning	○	○	○	○
f. Engaging with performance and development plans and/or professional development	○	○	○	○
g. Engaging professionally with colleagues	○	○	○	○
h. Teaching Aboriginal and Torres Strait Islander students	○	○	○	○
i. Supporting students with disabilities	○	○	○	○
j. Developing strategies for teaching literacy	○	○	○	○
k. Developing strategies for teaching numeracy	○	○	○	○
l. Involving parents/guardians in the educative process	○	○	○	○
m. Making effective use of Information and Communication Technology (ICT)	○	○	○	○

YOUR VIEWS ON TEACHING

56. How satisfied are you with the following aspects of your job?

Please tick one box in each row.

		Very dissatisfied	Dissatisfied	Satisfied	Very satisfied
a.	The amount of teaching you are expected to do	○	○	○	○
b.	The amount of administrative and clerical work you are expected to do	○	○	○	○
c.	Your freedom to decide how to do your job	○	○	○	○
d.	Your opportunities for professional learning	○	○	○	○
e.	Your opportunities for career advancement	○	○	○	○
f.	The balance between your working time and your private life	○	○	○	○
g.	Your salary	○	○	○	○
h.	The rewards available to you for superior performance	○	○	○	○
i.	The feedback you receive on your performance	○	○	○	○
j.	Managing student behaviour	○	○	○	○
k.	What you are currently accomplishing with your students	○	○	○	○
l.	The number of staff available to your school	○	○	○	○
m.	The school's physical resources (e.g. buildings, grounds)	○	○	○	○
n	The school's educational resources (e.g. equipment, teaching materials).	○	○	○	○
o	The culture and organisation of your school	○	○	○	○
p	Your working relationships with your colleagues	○	○	○	○
q	Your working relationships with your Principal	○	○	○	○
	Overall, how satisfied are you with your current job?	○	○	○	○

57. At this stage, how do you see your future in the teaching profession?

- ○ I expect that teaching will be my lifetime career
- ○ I am unlikely to leave teaching
- ○ I am thinking about an alternative career
- ○ I am actively seeking an alternative career

Thank you for taking the time to complete this questionnaire.
All responses will be kept confidential.

Appendix 7: Summary information on data collections

Teacher workforce surveys and datasets

Staff in Australia's Schools survey

The 2013 SiAS survey was commissioned by the Australian Government Department of Education. Its purpose was to provide a detailed picture of the Australian primary and secondary school teacher workforce, and information to assist in workforce planning. The survey was conducted between May and August 2013. Earlier waves of the survey were conducted in 2006–07 and 2010.

The 2013 data was collected from a representative sample of Australian schools, with all teachers in those schools invited to participate. It was designed to produce robust population statistics at the national level. SiAS collected information from both teachers and school leaders (principals and deputy principals). SiAS gathered a wide range of information at the individual teacher and school leaders level, including:

- demographics;
- qualifications and tertiary study;
- current position and work;
- professional learning;
- career paths in teaching and future career intentions;
- activities outside teaching; and
- more detailed information from early career teachers and school leaders.

The main report for the survey can be found at:
https://docs.education.gov.au/system/files/doc/other/sias_2013_main_report.pdf

The Longitudinal Teacher Education Workforce Study

The Longitudinal Teacher Education Workforce Study targeted the career progression of 2011 graduates from ITE programs into school teaching employment. It collected data on their deployment into and retention in teaching employment, as well as their mobility in terms of geographic location and school sector. The study examined graduate views of the effectiveness of their teacher education programs as preparation for teacher employment, and the views of principals on graduates' classroom readiness.

Graduate teachers were surveyed three times over an 18-month period in March and October 2012 and March 2013. Response rates ranged from 8.3% to 16.7% over the three rounds of the survey. The main report for the survey can be found at: https://docs.education.gov.au/system/files/doc/other/ltews_main_report.pdf

The Teaching and Learning International Survey

TALIS is conducted under the auspices of the OECD. TALIS collects internationally comparable data on the learning environment and working conditions of teachers in schools in participating countries to assist in the development and review of teacher workforce policies. Lower secondary teachers and principals in a representative sample of schools are surveyed regarding the ways in which teachers' work is recognised, appraised and rewarded and their professional development needs met. The survey also collects information about teachers' pedagogical practices, attitudes and beliefs. Two hundred Australian schools were selected to participate in the 2013 survey. Thirty-four countries participated in the 2013 survey, including 24 OECD members. The survey was first conducted in 2004.

The survey's focus on lower secondary teachers aligns to that of the Programme for International Assessment of Students (PISA) survey of 15 year olds. The country note for Australia can be found at: http://www.oecd.org/australia/TALIS-2013-country-note-Australia.pdf

The National Teaching workforce Dataset

The NTWD was funded by the Australian Government through the Teacher Quality National Partnership. It was developed over a three-year period and holds data at the individual level on 440,000 teachers, 314,000 employed teachers and 127,000 additional registered teachers. Data collection was sought for 45 specified data items and was collected primarily from the TRAs and teacher employer bodies. These data items were identified in earlier advice provided to the Department of Education, Employment and Workplace Relations by the ACER (Owen et al. 2008). The data collected were primarily for 2012.

Whilst stakeholders were aware of some limitations of the NTWD, particularly the incompleteness of data available from teacher employers, its legacy of understanding, professional networks and processes and protocols for data handling and release were the subject of much positive comment during the current project. The reports for the NTWD can be found at: https://education.gov.au/school-teacher-workforce-data-reports

Schools, Australia

The ABS runs *Schools, Australia*, which reports annually on students and staff in Australian schools. The data are sourced from the National Schools Statistics Collection and are collected on a census date – the first Friday in August each year.

These data are collected from all Australian schools at the school level. The data are used to report on aspects of schooling, including numbers of students (and student populations of interest) and teachers, apparent participation and retention rates, and student–staff ratio. Information on *Schools, Australia* can be found at: http://www.abs.gov.au/ausstats/abs@.nsf/mf/4221.0

Student data collections and surveys

The Higher Education Student Collection

The HESDC is managed by the Department. Data is collected annually (with updates) at the individual student level on all higher education students resulting in a comprehensive set of statistics. Data included in the Higher Education Statistics Collection relate to:

- courses provided by higher education institutions;
- numbers and characteristics of students undertaking courses;
- student load;
- completion of units of study and courses;
- student liability status;
- numbers and characteristics of staff in higher education institutions;
- income and expenditure for higher education institutions;
- research activity; and
- undergraduate applications, offers and acceptances.

The data are housed in HEIMS. Additional information is available at: https://www.education.gov.au/higher-education-statistics

The Graduate Outcomes Survey and Employer Satisfaction Survey

The GOS is conducted annually and collects information about graduate employment outcomes and previous employment, continuing study and work-seeking status and work-seeking behaviour. It is administered in online. The survey has two reference dates each year: 31 October for graduates completing in the first half of the preceding year, and 30 April for graduates completing in the second half of the preceding year. The GOS's predecessor was the Graduate Destination Survey.

The ESS gathers employer feedback on the extent to which students are being taught the right mix of generic and technical skills to be prepared for the workforce. The research aims to ensure that institutions are responsive to labour market and industry needs. Employment supervisors of GOS graduates are in scope for the ESS. Employer contact details are sought from graduates in the GOS

Further information can be found at: http://www.srcentre.com.au/taking-part-in-research/survey-participants/current-research

Appendix 8: Teacher regulatory authorities – operations and data collection

	BOSTES (NSW)	VIT (Vic)	QCT (QLD)	TRB (WA)	TRB (SA)	TRB (Tas)	TQI (ACT)	TRB (NT)
Scope of registration/accreditation								
All school teachers registered	No[i]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Database of all registered teachers' information	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Early childhood teachers w/ graduate qualifications registered	No[ii]	Yes	Yes	Yes	Yes	Yes	No	Yes
Pre-registration								
Pre-registration current or planned	No	No	No	No	No	Yes	No	No
Provisional registration/accreditation (graduate on the APST)								
Provisional registration period	3–6 years	2 years	2 years	3 years	3 years	5 years	1 year	3 years
Extension allowed	Yes	Yes[iii]	Yes	Yes	Yes	Yes	Yes	Yes
Maximum total period of provisional registration	No set limit	No set limit	4 years	No set limit	6 years	No set limit	6 years[iv]	No set limit
Full registration/accreditation (proficient on the APST)								
Minimum teaching practice requirement	160–180 days[v]	80 days	200 days	100 days	200 days in 5 years	185 days in 5 years	180 days	180 days
Registration duration	1 year	1 year	5 years	5 years	3 years	1–5 years	1 year	5 years
Teaching practice employer/school data captured	Yes	Yes	Yes	Yes	No[vi]	Yes	Yes	Yes
Registration renewal								
Required renewal frequency	Annual	Annual	5 years	5 years	3 years	1–5 years	Annual	5 years
Renewal timing	Calendar year	By 30 September	Elapsed time	Elapsed time	By 31 January	By 31 December	By 31 March	By 31 December
Minimum renewal teaching practice requirement	No set minimum[vii]	20 days	100 days in 5 years	100 days	60 days in 3 years	120 days in 5 years	20 days in 1 year[viii]	180 days in 5 years
Minimum renewal professional development requirement	100 hours	20 hours	20 hours[ix]	100 hours[x]	60 hours in 3 years	None[xi]	20 hours in 1 year	20 hours per year
Online collection of registration/re-registration information	Yes (some items)	Yes	Yes (some teachers)	Yes (some teachers)	Yes[xii]	Yes	Yes	Yes
Other registration/accreditation status								
Highly accomplished teacher accreditation/registration	Yes	No	No	No	No	No	No[xiii]	Yes
Lead teacher accreditation/registration	Yes	No	No	No	No	No	No[xiv]	Yes
Subject specialist teacher accreditation/registration	No	No	No	No	No	No	No	No
Other	Leave of	Permission	Returning to	Non-	Restricted	Limited	Permit to	Authority to

	BOSTES (NSW)	VIT (Vic)	QCT (QLD)	TRB (WA)	TRB (SA)	TRB (Tas)	TQI (ACT)	TRB (NT)
	Absence	to Teach; Non-Practising Registration	Teaching	Practising Registration; Limited Registration	Registration; Registration / Provisional Registration with Conditions; Special Authority for an Unregistered Person to Teach	Authority to Teach	Teach	be Employed
Registered teacher data collection								
Teacher street and postal address	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Employer/s (including contact details)	Yes	Yes	Yes	Yes	No	No[xv]	Yes	Yes
Teacher ATSI status	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Registered teachers surveyed	No	Yes	Yes[xvi]	No	Yes	Yes	No	No
• Survey type	-	Varies	Online & mail	-	Yes	Not online	-	-
• Typical response rate	-	Varies	12.5%	-	6–25%	29–90%	-	-

[i] All teachers to be accredited by 2018.
[ii] All early childhood teachers will be accredited from 2016.
[iii] Via a new application for provisional registration.
[iv] In extenuating circumstances only; five years is the normal limit.
[v] Recommendation only; requirements are set by employers.
[vi] Although applicants must provide evidence of employment at one or more schools.
[vii] However teachers must submit a Maintenance of Accreditation Report which describes their teaching practice during the period.
[viii] Requirement yet to be implemented.
[ix] Applies only to teachers who have taught for at least 20 days that year.
[x] During a transitional period to 6 December 2017, some teachers can renew without completing 100 hours.
[xi] Future imposition of a minimum requirement is under consideration.
[xii] Registration applications are submitted in hard copy; renewals are submitted in hard copy and online.
[xiii] Although they may apply separately for Highly Accomplished Teacher certification.
[xiv] Although they may apply separately for Lead Teacher certification.
[xv] Collected in some cases.
[xvi] Registering teachers are currently asked for information on major and minor area of specialisation. QCT is planning to expand collection of this data.

Appendix 9: Frequency table - ITE programs graduate numbers

Frequency table – Number of graduates from accredited ITE programs, Australia, 2012

Number of graduates	Frequency
1–10	316
11–20	74
21–30	34
31–40	20
41–50	9
51–100	67
101–150	24
151–200	7
201–250	3
251–300	2
301–350	3
351–400	1
401–450	1
451–500	0
501–550	1
Total	562

Source: AITSL (unpublished data)

Note: Includes 225 courses with fewer than five graduates.

Appendix 10: Addition information on teacher workforce data items

Category	Data item	Data definition / specification	Proposed to be collected from	Proposed collection method
Identifier	Unique teacher identifier[10]	NTWD[11]	All teachers	TRA/admin
Demographics	Gender	NTWD	All teachers	TRA/admin
	Year of birth	NTWD	All teachers	TRA/admin
	Aboriginal and Torres Strait Islander status	SIAS	All teachers	TRA/survey
	Language spoken at home	SIAS	All teachers	TRA/survey
	Country of birth	SIAS	All teachers	TRA/survey
	Year of arrival in Australia	SIAS	All teachers	TRA/survey
Teacher registration	Registration status	NTWD	All teachers	TRA/admin
	Teaching restrictions	NTWD	All teachers	TRA/admin
	Conferral year	NTWD	All teachers	TRA/admin
	Regulatory body	NTWD	All teachers	TRA/admin
Qualifications	ITE program	AITSL[12]	Teacher registering for the first time plus early career teachers	TRA/survey
	Specialisation	SiAS	All teachers	TRA/survey
	Subject studies at tertiary level	SiAS	All teachers	TRA/survey
	Qualification level	SiAS	All teachers	TRA/survey
	Qualification field	SiAS	All teachers	TRA/survey
	Qualification year	SiAS	All teachers	TRA/survey
	Institution name	SiAS	All teachers	TRA/survey
Prof D'ment	TBD[13]	TBD	All teachers	TRA/survey
Current employment	Employment status	SiAS	All teacher post registration	TRA/survey/GOS[14]
	Teaching load	SiAS	All teacher post registration	TRA/survey/GOS
	Year started with current employer	SiAS	All teacher post registration	TRA/survey/GOS
	Teacher classification	SiAS	All teacher post registration	TRA/survey/GOS
	Salary range	SiAS	All teacher post registration	TRA/survey/GOS
Current school	School name[15]	ACARA	All teacher post registration	TRA/survey/GOS
	School type	ACARA	All teacher post registration	TRA/survey/GOS
	School sector	ACARA	All teacher post registration	TRA/survey/GOS
	School location	ACARA	All teacher post registration	TRA/survey/GOS
Current teachings	Subject taught	SiAS	All teacher post registration	TRA/survey/GOS
	Year level taught	SiAS	All teacher post registration	TRA/survey/GOS
	Teaching and non-teaching duties	SiAS	All teacher post registration	TRA/survey/GOS
Attitudes and Perceptions	Teacher perception of helpfulness of ITE program	SiAS	All teacher post registration	TRA/survey/GOS
	Teacher perceptions of helpfulness of induction	TBD[16]	All teacher post registration	TRA/survey/GOS
	Employer perception of classroom readiness	SiAS	All mentors and principals post registration	TRA/survey/GOS
	Teacher career intentions: intention to remain or leave teaching	SiAS	All teacher post registration	TRA/survey/GOS
	Factors affecting intention to leave teaching prior to retirement	SiAS	All teacher post registration	TRA/survey/GOS

[10] The relaxing of privacy rules may allow PII data to be provided by TRAs in the future, providing another method of data linkage.
[11] Using the Ernst and Young developed script to generate a unique identifier for the NTWD would allow linkage to data items in the NTWD. The script is owned by the Department.
[12] A database of accredited ITE programs would need to be established.
[13] During consultations for the project many teacher employers indicated that professional development categories were being aligned to the APST or APSP. Whilst an approach to capturing information on professional development was agreed for the SiAS, this should be revisited and data items and their definitions agreed.
[14] GOS will collect data on teachers once only in the first six months post-ITE graduation. GOS would only be used to collect a range of data on teacher demographics, registration and qualifications if data linkage of GOS data to TRA data is unsuccessful.
[15] A respondent could nominate whether they are willing to provide information on the schools at which they teach or that they only want level, sector and location recorded, derived from the schools. A schools database would be required.
[16] AISTL are developing advice on a nationally consistent approach to induction. This advice should be used to frame the data definition for this data item.

References

Alberta Education (2015), *Questions about Teacher Workforce Information System (TWINS)*, retrieved 5 October 2015, https://education.alberta.ca/admin/workforce/faq/teachers/twins.aspx

Australian Government (2014), *National Teaching Workforce Dataset Project Report,* retrived 22 September 2015, *https://docs.education.gov.au/node/36285*

Australian Institute for Teaching and School Leadership (2014a), *Australian Professional Standards for Teachers*, retrieved 28 September 2015, http://www.aitsl.edu.au/australian-professional-standards-for-teachers/standards/list

Australian Institute for Teaching and School Leadership. (2014b). *Initial Teacher Education: data report 2014*, AITSL, Melbourne.

Australian Institute for Teaching and School Leadership. (2015). *Initial Teacher Education: data report 2015*, AITSL, Melbourne.

Board of Studies Teacher and Education Standards (BOSTES) (2014), *NSW Response to the invitation from the Commonwealth Minister's Teacher Education Ministerial Advisory Group to comment on its Issues Paper*, retrieved 5 September 2015, www.nswteachers.nsw.edu.au/DownloadDocument

Buchanan, J, Prescott, A, Schuck, S, Aubusson, P, & Burke, P (2013), Teacher retention and attrition: Views of early career teachers, *Australian Journal of Teacher Education*, vol. 38, no. 3, pp. 124–141.

Centre for Education Statistics and Evaluation (CESE) (2013), *Great teaching, inspired learning: what does the evidence tell us about effective teaching?* NSW Department of Education and Communities, Sydney.

Data Quality Campaign (2014), *Paving the path to success*, Data for Action 2014, Washington.

Department of Education and Early Childhood Development (2013), *From new directions to action: world class teaching and school leadership*, Department of Education and Early Childhood Development, Melbourne.

Dowling, A, O'Malley, K, & McKenzie, P (2009), *Development of a framework for a nationally consistent dataset concerning the teaching workforce across Australia*, Australian Council for Educational Research, Melbourne.

European Commission/EACEA/Eurydice (2015), The teaching profession in Europe: practices, perceptions and policies. Eurydice Report, Publications Office of the European Union, Luxembourg.

Hattie, J (2003), Teachers make a difference: what is the research evidence? *Australian Council for Educational Research Annual Conference: Building Teacher Quality* (pp. 1–21), retrieved 1 October 2015, https://cdn.auckland.ac.nz/assets/education/hattie/docs/teachers-make-a-difference-ACER-(2003).pdf

Kentucky Center for Education and Workforce Statistics (KCEWS) (2015), Kentucky Center for Education and Workforce Statistics homepage, viewed DATE, https://kcews.ky.gov/about.aspx

Kentucky Center for Education and Workforce Statistics (KCEWS) (2014), *2014 Kentucky Teacher Preparation Feedback Reports Technical Notes*, retrieved 5 October 2015, https://kcews.ky.gov/Reports/TPFeedback/2014TPFRTechNotes.pdf

Knowles, W (2015), Education: Germany's biggest refugee challenge, *New Europe*, retrieved 4 October 2015, http://neurope.eu/article/education-germanys-biggest-refugee-challenge/

Kultusministerkonferenz (KMK) (2014), *The education system in the Federal Republic of Germany 2012/2013 - A description of the responsibilities, structures and developments in education policy for the exchange of information in Europe*, Secretariat of the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany, Bonn, Germany.

Leibniz Institute for Educational Trajectories (2015), *Lehramtsstudierenden-Panel*, retrieved 5 October 2015, https://www.lifbi.de/de-de/weiterestudien/lap.aspx

McDougall, B., 'No school jobs available for thousands of trained teachers throughout NSW,' *Daily Telegraph*, July 7 2014, retrieved 3 September 2015, http://www.dailytelegraph.com.au/news/nsw/no-school-jobs-available-for-thousands-of-trained-teachers-throughout-nsw-schools/story (see also BOSTES 2014)

Massachusetts Department of Elementary and Secondary Education (2015), *EPIMS Data Handbook – Version 6.0*, retrieved 15 August 2015, http://www.doe.mass.edu/infoservices/data/epims/EPIMS-DataHandbook.pdf

Massachusetts Department of Elementary and Secondary Education (2011), EPIMS – Frequently Asked Questions (v.0.7), retrieved 26 September 2011, http://www.doe.mass.edu/infoservices/data/epims/epimsfaq.pdf

Masters, G. (2015) 'Planning a stronger teacher workforce,' *Teacher*, March 2013, retrieved 3 September 2015, https://www.teachermagazine.com.au/geoff-masters/article/planning-a-stronger-teacher-workforce

National Forum on Education Statistics (2010), *Traveling through time: the forum guide to longitudinal data systems. Book one of four: what is an LDS?* (NFES 2010-805), National Centre for Education Statistics, Institute of Education Sciences, U.S Department of Education, Washington, DC.

National Registration and Accreditation Scheme (NRAS) (2013), National Registration and Accreditation Scheme (NRAS), viewed 30 September 2015, http://www.health.gov.au/internet/main/publishing.nsf/Content/work-nras

New South Wales Council of Deans of Education (NSW CDE) (2015), *Employment of graduate teachers in Australia*, NSW Council of Deans of Education, retrieved 17 November 2015, http://www.nswcde.org.au/Publications/(category)/196

OECD (2015), *Initial Teacher Preparation Study: EDU/INES/TASLIS/RD(2015)3* (unpublished), OECD, Paris.

Ontario College of Teachers (2014), *Transition to teaching,* Ontario College of Teachers, Toronto.

Owen, S, Kos, J, & McKenzie, P (2008), *Staff in Australia's schools: teacher workforce data and planning processes in Australia*, report to the Department of Education, Employment and Workplace Relations, ACER, Melbourne.

Productivity Commission (2012), *Schools workforce*, Productivity Commission, Canberra.

RAND Education (2012), *Teachers matter: understanding teachers' impact on student achievement* (vol. 1), RAND, Santa Monica, CA.

South Australian Teacher Education Taskforce (2012), *Teacher supply and demand in South Australia: beyond 2010*, South Australian Teacher Education Taskforce, Adelaide.

National Registration and Accreditation Scheme (2013), retrieved 30 September 2015, http://www.health.gov.au/internet/main/publishing.nsf/Content/work-nras

Statcan (2015), *Elementary-Secondary Education Survey (ESES)*, retrieved 4 October 2015, http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5102

Statistische Veröffentlichungen der KultusMinisterkonferenz (2015), *Lehrereinstellungsbedarf und –angebot in der Bundesrepublik Deutschland 2014 – 2025– Zusammengefasste Modellrechnungen der Länder*. 208. Bonn, Germany.

Teacher Education Ministerial Advisory Group (TEMAG) (2014), *Action Now: classroom ready teachers*, Australian Government Department of Education and Training, Canberra.

United States Department of Education (2015), *Title II Higher Education Act* homepage, viewed DATE, https://title2.ed.gov

United States Department of Education (2013), *Preparing and credentialing the nation's teachers: the Secretary's Ninth Report on Teacher Quality*, Office of Postsecondary Education, Washington, DC.

Weldon, P. (2015), The teacher workforce in Australia: supply, demand and data issues, *Policy Insights*, Issue 2, ACER, Melbourne.