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Knowledge and Skills Domain Plan 2010:

Draft for consultation

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Preface

As part of its leadership role in strengthening the Official Statistics System, Statistics New Zealand is working with other agencies to develop domain plans. The plans are an important part of the Official Statistics System and stakeholders 'own' the development process. Statistics New Zealand and the Ministry of Education have worked together to develop the Knowledge and Skills Domain Plan.

The purpose of a domain plan is to achieve clarity and agreement from stakeholders about the main statistical priorities and the strategy for addressing these over, at least, the next five to eight years. The domain plans will give:

- a long-term picture of what is required to improve official statistics
- a coordinated plan for addressing issues
- a cross-agency approach to long-term priorities.

The process for the Knowledge and Skills Domain Plan involved consultation with a range of organisations – both producers and users of statistics. The participation of these organisations and their support for this domain plan is appreciated.

We now seek to consult on the domain plan. Comments on the enduring information needs are welcome, especially in areas that are relatively difficult or complex to measure in official statistics. Feedback is also sought on any significant information needs or gaps in existing knowledge and skills statistics that are not included in the plan. The submission period runs until close of business on Friday 20 August 2010.

Geoff Bascand
Government Statistician

Standards and further information

Source

All material in this report has been compiled by Statistics New Zealand and the Ministry of Education. Input has been provided by a range of organisations.

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Introduction

Domain plans represent a strategic shift in direction for the consultation process used to identify the need for new or modified content in official statistics, from a vehicle or collection focus to a focus around topics or domains. Domain plans provide a structured approach to areas which span the statistical activities of several agencies or sectors. Statistics New Zealand is working towards future decision-making in the Official Statistics System is well-informed about and responsive to Māori statistical needs. Specifically, domain plans seek to:

- develop a long-term picture of information needs, rather than reacting to issues
- develop a coordinated plan to address issues, rather than tackling them on a piecemeal basis
- work in partnership with other agencies and partners, including Māori, to obtain agreement to priorities, rather than take a single agency view.

The Knowledge and Skills Domain Plan identifies 14 key statistical information needs, assesses how the current supply of data meets these, and makes recommendations to address shortcomings and gaps.

Enduring research and policy topics

Knowledge and skills are important contributors to the social, cultural, and economic well-being of individuals and nations. In this domain plan, knowledge and skills are defined as:

> the abilities, talents, and knowledge that individuals acquire through engaging in learning in both formal and non-formal settings and through other life experiences.

Knowledge and skills information needs and key policy issues have been grouped into six broad areas in the domain plan, each with between one and four topic questions.

Level and distribution of knowledge and skills

Topic 1: What is the distribution and level of different types of knowledge and skills across and within the population?

Topic 2: How does New Zealand's level of knowledge and skills compare internationally?

Topic 3: What is the level of knowledge and skills required for New Zealand to participate in a global society and economy?

Attitudes and participation

Topic 4: To what extent do people participate in formal learning?

Topic 5: To what extent do people participate in non-formal learning?

Topic 6: What are the barriers to participation in learning at all levels?

Topic 7: What effect do attitudes, expectations, and perceptions of individuals have on their uptake of learning opportunities?

Background influences

Topic 8: What is the effect of background influences on participation in, engagement with, and outcomes from learning?

Topic 9: How are both formal and non-formal types of learning supporting maintenance of te ao Māori, the Māori language, and Māori cultural awareness?

Pathways and transitions

Topic 10: What pathways do people take at different times of their lives in order to obtain or upgrade their workplace and life skills, and their qualifications?

Outcomes of knowledge and skills

Topic 11: How important is the quality and content of early childhood learning to learning pathways and outcomes?

Topic 12: What are the social and economic outcomes for individuals from their knowledge and skills?

Topic 13: What is the relationship between the current level (and growth) of knowledge and skills in New Zealand and other social and economic trends?

Research and knowledge creation

Topic 14: What is the extent and value of research and knowledge creation in New Zealand?

Assessment of the extent to which statistical needs are being met

There is a wide range of official statistics about knowledge and skills in New Zealand. However, the document authors established that there are gaps in the statistical information base and that there is scope for improving the quality of available statistics.

The table below summarises the topic areas in to the knowledge and skills domain. It gives a broad assessment the coverage of each topic from a statistical perspective and a 'traffic light' indication of how well each topic area is currently informed. These assessments are subjective and based on the data currently available for the topic areas.

Table 1 – Knowledge and skills gap analysis

Knowledge and skills domain plan topics		Relative complexity	Gap severity H	M	L
Level and distribution of knowledge and skills					
1	What is the distribution and level of different types of knowledge and skills across and within the population?	Medium			●
2	How does New Zealand's level of knowledge and skills compare internationally?	Medium			●
3	What is the level of knowledge and skills required for New Zealand to participate in a global society and economy?	High			●
Attitudes and participation					
4	To what extent do people participate in formal learning?	Low			●
5	To what extent do people participate in non-formal learning?	High	●		
6	What are the barriers to participation in learning at all levels?	Medium		●	
7	What effect do attitudes, expectations, and perceptions of individuals have on their uptake of learning opportunities?	Medium			●
Background influences					
8	What is the effect of background influences on the participation, engagement, and outcomes from learning?	Medium			●
9	How are both formal and informal types of learning supporting maintenance of te ao Māori , the Māori language, and Māori cultural awareness?	High		●	
Pathways and transitions					
10	What pathways do people take at different times of their lives to obtain or upgrade their workplace and life skills, and their qualifications?	Low		●	
Outcomes of knowledge and skills					
11	How important is the quality and content of early childhood learning to learning pathways and outcomes?	Medium			●
12	What are the social and economic outcomes for individuals from their knowledge and skills?	Medium			●
13	What is the relationship between the current level (and growth) of knowledge and skills in New Zealand, and other social and economic trends?	High			●
Research and knowledge creation					
14	What is the extent and value of research and knowledge creation in New Zealand?	High		●	

To address the gaps and data deficiencies identified above, the following priorities for enhancement of knowledge and skills statistics have been identified.

Recommendations

Priority 1: Move Employment Outcomes from Tertiary Education (EOTE) into production

The 'Employment Outcomes of Tertiary Education Feasibility Study' was a joint project between Statistics NZ, Department of Labour, Ministry of Education, Inland Revenue and the Tertiary Education Commission. This produced a dataset that integrates administrative data from tax and education records from 2003 to 2006 of sufficient quality to produce official statistics. It has the potential to inform many enduring topics by providing statistics and a research dataset that would allow longitudinal analysis of the economic outcomes of participation in formal learning, including pathways and transitions. Furthermore, because of the comprehensive and detailed nature of the dataset, it can be disaggregated to provide new insights. Further information about the EOTE dataset is available at www.stats.govt.nz.

Informs topics: 4, 10, 12

Priority 2: Add the Ministry of Education's 'Transitions' dataset to Employment Outcomes from Tertiary Education (EOTE)

The Ministry of Education's Transitions dataset contains records of secondary school students. Adding this to the EOTE dataset would enable secondary school performance from Years 11 to 13 to be related to tertiary and workforce participation and outcomes, beginning with students who completed NCEA level 3 in 2005. Actioning this priority would inform monitoring of the transitions from school to tertiary education and work, and in particular, better identify young people who are not successful in this regard. Eventually, it will be possible to incorporate data from early secondary, intermediate, and primary schools.

Additionally, adding the Transitions dataset to EOTE would allow students' innate abilities to be statistically controlled for in analyses on the outcomes for students of tertiary education and training.

Informs topics: 4, 10, 12

Priority 3: Develop data sources which have information on tertiary education sector income for research and knowledge creation

There are established methods for analysing the quality of research outputs. But there is relatively poor information on the impact and outcomes of research activities – especially university research. Yet the most important priority in research policy relates to the extent of transfer and commercialisation of research findings. One good proxy for research impact is the extent to which businesses commission research – because businesses will only pay for research if they see a commercial value in the outputs. Information on sources of research income is not readily available, although some information on business expenditure on research and development is available.

Informs topic: 14

Priority 4: Combine quality measures of Early Childhood Education (ECE) with enrolment data

While the ECE topic is reasonably well covered, most of the information is geared only towards participation rates in ECE, which is only part of the picture. In order to assess progress towards the goal of every child having access to quality ECE, it is necessary to add information about the quality of ECE to information about participation rates. Quality reports from the Educational Review Office and training of education providers could be linked to enrolment data to build a full picture of participation and quality of early childhood education.

The Ministry of Education is proposing to allocate National Student Numbers (NSNs) when children are enrolled in ECE. If implemented, it would be possible to measure the value of ECE by comparing longer-term educational achievement with ECE characteristics.

Informs topic: 11

Priority 5: Collect information on participation in formal and non-formal education and training in the fourth General Social Survey (GSS)

There is far less information available in the knowledge and skills domain on non-formal learning. This is an inherently difficult topic to collect data on and it is likely that administrative data will never be available to provide this kind of information. However, one way of improving available information is by measuring participation in non-formal and formal learning in the General Social Survey. The GSS asks participants if they are currently doing any study or training (referring to both formal and non-formal) but it is not possible to distinguish between the two. Modifying the study questions from the fourth survey iteration (2014) to produce information on non-formal learning would provide proportions of the population learning outside of the formal education system.

Informs topics: 4, 5, 7, and 12

Priority 6: Move to better consistency between Statistics NZ household survey education questions

Statistics NZ's household surveys, including the population census, address many data needs. However, because knowledge and skills questions are asked in different ways, it is difficult to compare knowledge and skills statistics collected across surveys and over time. If questions were asked consistently, the quality of statistics would be improved.

Statistics NZ is currently working on a 'core' demographic module that would ensure these variables are collected consistently. Two questions in the proposed core relate to educational variables: highest qualification and current participation in study.

Beyond this, however, it is recommended that other knowledge and skills variables are also collected using consistent methods in new and re-developed surveys.

Informs topics: 1, 2, 4, and 5

Priority 7: Repeat the 1996 Education and Training Survey (ETS) as a supplement to the Household Labour Force Survey (HLFS)

The ETS informed several enduring topics, including those for which there is less information for adults, such as the effect of attitudes on uptake of learning and barriers to participation. However, this data is out of date and cannot be used to inform current policy information demands.

Informs topics: 5, 6, 10, and 12

Priority 8: Join the OECD Programme for the International Assessment of Adult Competencies (PIAAC)

The Adult Literacy and Life Skills Survey (ALL) provided valuable data not available from other sources, and research on this data continues to produce new insights. However, the information captured by that survey will be out of date by approximately 2016, and will leave a considerable gap in knowledge and skills statistics. Therefore, it is important to plan for the implementation of a new data source. New Zealand is not participating in the first wave of PIAAC, which begins in 2011. It is anticipated that the second wave will begin in 2021, and will produce data that replicates and extends the information gained from the ALL survey.

Informs topics: 1, 2, 3, 4, 5, 6, 12, and 13

Submission process

The Knowledge and Skills Domain Plan was initially developed by the Ministry of Education as part of a process coordinated by Statistics NZ. This was then further developed by Statistics NZ in consultation with a range of stakeholders in the Programme of Official Social Statistics (POSS).

The next stage in the development of the Knowledge and Skills Domain Plan is external consultation on this draft of the plan. The submission period runs until close of business on Friday 20 August 2010.

Please email submissions to knowledgeandskills@stats.govt.nz, or post to Knowledge and Skills Domain Plan Consultation, Statistics NZ, PO Box 2922, Wellington.

Feedback is especially welcome on those areas that are relatively difficult or complex to measure in official statistics, and/or are research-related. Feedback is also sought on any significant information needs and gaps in existing knowledge and skills statistics that are not included in the plan.

Submissions should give details about users' information needs and what they would use the information for. The submissions will be evaluated, and priorities will be based on enduring information needs (ie, likely to be relevant for at least five years).

Submissions should also meet at least one of these criteria:

- be relevant to policy (ie, development, evaluation, or monitoring) or contribute to a better understanding of trends relating to the Knowledge and Skills Domain Plan
- fill a gap or address a deficiency in the existing body of official statistics, where official statistics must:
    - provide valid and cost-effective measurement

- confer public benefits that clearly outweigh the compliance burden and privacy impact.

All submissions will be considered and assessed, and a revised domain plan, including recommendations, will be submitted to the Government Statistician in late 2010. Once approved, this will become the final domain plan and the Government Statistician will then consider recommendations on addressing these priorities along with those from other statistical domain plans. Actions to implement the plan may be made under the authority of the Government Statistician according to the Statistics Act 1975, and will be undertaken in cooperation with relevant agencies.

2 Background to the Knowledge and Skills Domain Plan

Introduction

Domain plans are an important aspect of Statistics New Zealand's role in leading, strengthening and coordinating the development and ongoing integrity of the Official Statistics System (OSS). This leadership role is largely achieved through promoting shared responsibility and with the cooperation of other agencies in improving official statistics.

The Knowledge and Skills Domain Plan was initially developed by the Ministry of Education as part of a process coordinated by Statistics NZ. It was then further developed by Statistics NZ in consultation with a range of stakeholders in the Programme of Official Social Statistics (POSS), which commenced in 2004/05.

Domain plans represent a strategic shift in direction for the consultation process used to identify the need for new or modified content in official statistics, from a vehicle or collection focus to a focus around topics or domains. They provide a structured approach to areas which span the statistical activities of several agencies or sectors. Specifically, domain plans seek to:

- develop a long-term picture of information needs, rather than reacting to issues
- develop a coordinated plan to address issues, rather than tackling them on a piecemeal basis
- work in partnership with other agencies and partners, including Māori, to obtain agreement to priorities, rather than take a single-agency view.

Domains are grouped within social, economic, and environmental pillars. The social pillar contains 12 individual domains that relate to major social sectors or areas of social well-being, and knowledge and skills is one of these. The remaining social domains are:

- population
- housing
- safety and security
- economic standard of living
- health
- paid work
- culture and identity
- social connectedness
- human rights
- physical environment
- leisure and recreation.

A thirteenth, cross-cutting, domain deals with statistics that are relevant to all other domains. Together, these domains form the POSS framework, a ten-year whole-of-government programme to improve the range and quality of official social statistics.

Key areas for domain plans to cover

Domain plans are tailored to the uniqueness of each sector and the needs of the stakeholders concerned. However, there are some common threads, which include:

- *Identifying the key research and policy questions* – the starting point for all domain plans is to identify the enduring research and policy questions that stakeholders are seeking to answer through official statistics.
- *Identifying key data sources relevant to these questions* – undertaking a stocktake of data sources that are currently available to answer the research and policy questions.
- *Identifying barriers to answering the key questions* – assessing the available data sources in light of the information required to answer the key research and policy questions. Barriers may include, for example, information gaps, poor data quality, privacy constraints, timeliness issues, and lack of coherence between available data sources.
- *Having a strategic focus over at least the next five years* – to avoid being focused on operational or short-term policy demands, all plans aim to have a minimum time horizon of at least five years.
- *Identifying key priorities and how to address them* – a key part of the plan is to make trade-offs amongst competing needs and develop a list of key priorities together with the key steps needed to achieve these.

The domain planning process

The Knowledge and Skills Domain Plan was initially developed by the Ministry of Education as part of a process coordinated by Statistics New Zealand. This was then further developed by Statistics NZ in consultation with a range of stakeholders to the Programme of Official Social Statistics (POSS), including representatives from the Ministry of Social Development, Ministry of Justice, Department of Labour, Ministry of Research, Science and Technology, The Treasury, Ministry of Health, Te Puni Kōkiri, Ministry of Pacific Island Affairs, Ministry of Women's Affairs, Office of Disability Issues, Housing New Zealand Corporation, and Office of Ethnic Affairs.

A series of 'enduring topics' for the knowledge and skills domain was then developed. An audit of available data sources that inform the topics was completed in 2009 (see Appendix 2), which allowed a gap analysis to be completed by Statistics NZ and the Ministry of Education.

The gap analysis showed that the majority of topics are well covered by existing statistical collections and reports, although there are some places where improvements to coverage could be made.

This document will provide the basis for a strategic plan for official statistics on the knowledge and skills area for the next five years.

The significance of knowledge and skills statistics

Statistics on knowledge and skills have an important role to play in public policy analysis. The role includes meeting a variety of community information needs, and informing decisions about investment in formal learning institutions and industry training.

In this domain plan, knowledge and skills are defined as:

> the abilities, talents and knowledge that individuals acquire through engaging in learning in both formal and non-formal settings, and through other life experiences.

The knowledge and skills of a population's workforce have a great effect on a nation's productivity, which in turn affects individuals' standards of living (Baumol et al, 1991). To develop a strong economy requires a productive labour force comprised of skilled and knowledgeable workers. In the past, New Zealand has suffered skills shortages in some occupational groups, which limits the potential for economic growth (Department of Labour, 2009a).

Knowledge and skills are important not only for economic growth and innovation, but also for their contribution to social connectedness and personal well-being, as knowledge and skills enhance people's ability to cope in society from day to day. They are important for gaining access to services and for participating in political, social, and cultural life. Knowledge and skills also provide individuals with the means to enhance their well-being over time by helping them to understand the options available in a variety of spheres, guiding them in choosing pathways that return benefits.

For Māori, mātauranga Māori (which encompasses cultural knowledge underpinning Māori social and economic development) is maintained and sustained inter-generationally through collectives such as whānau and hapū in te ao Māori settings. Mātauranga Māori includes for instance, the skill and use of te reo Māori and knowledge of whakapapa. Mātauranga Māori contributes uniquely to the well-being of Māori and wider New Zealand society, and supports Māori succeeding as Māori to participate in and contribute to New Zealand society socially and economically.

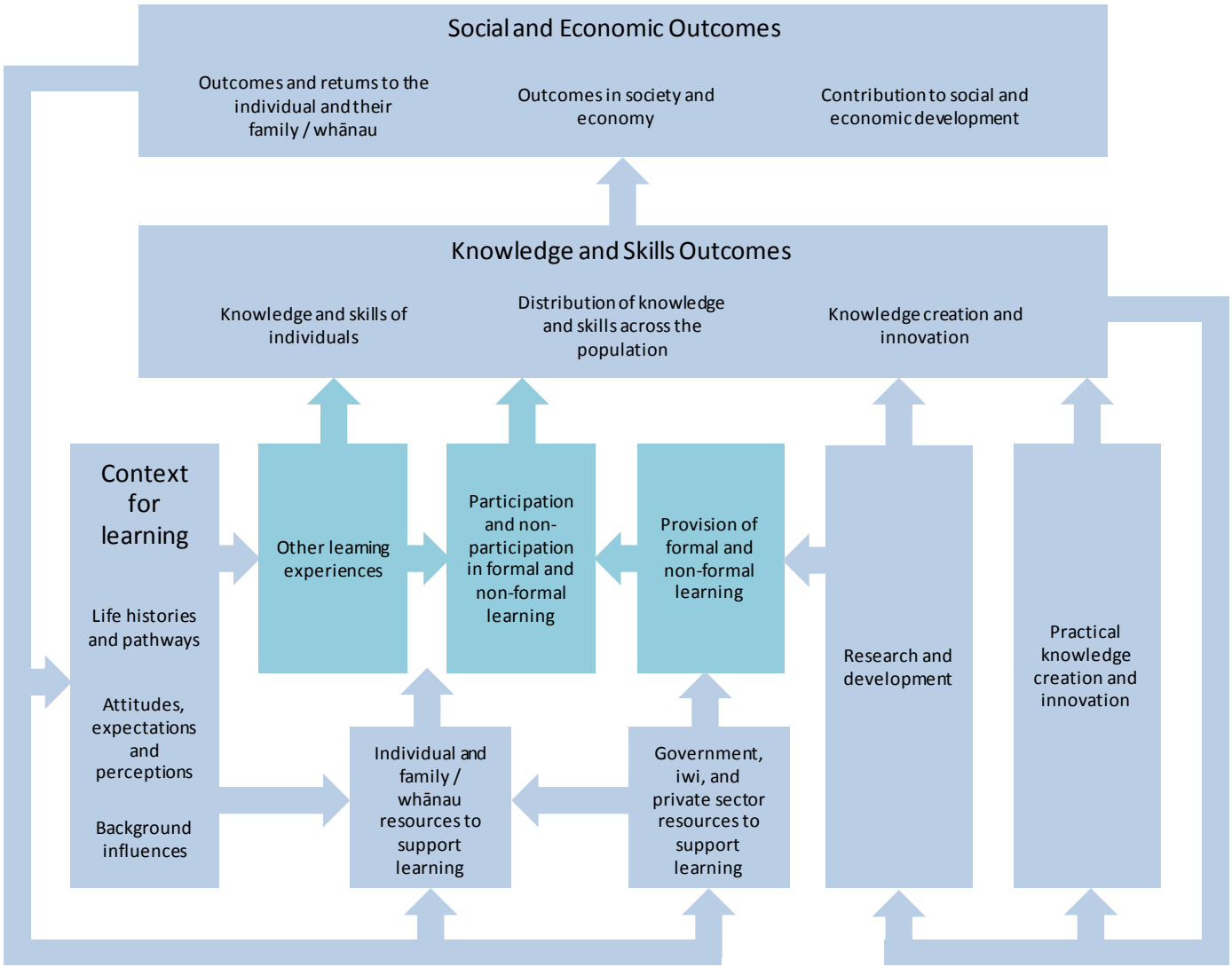
Considerable use is made of the statistics in public policy decisions relating to education, labour market and industry regulation, migration, tax policy, internationalisation, and social policy (MacCormick, 2008). Education is one of the largest areas of government expenditure, and policy decisions are the major driver behind expenditure decisions. Knowledge and skills policy is being given heightened consideration worldwide due to an emphasis on increasing the level of human capital. As knowledge and skill development is a life-long process, policy decisions require information that takes a broad, long-term perspective.

A knowledge and skills statistics framework

A framework provides a structured way of thinking about and organising information in a particular domain or area of interest. It defines the scope of activities in a particular area, identifies key concepts and elements associated with the area and organises these into a logical structure.

A model developed by the Ministry of Education served as the knowledge and skills framework for the development of this domain plan (see Figure 1). This model shows that formal and non-formal education is a key activity for development of the country's knowledge and skills, which in turn contribute to a range of social and economic outcomes for individuals, communities, and the country. The role of informal learning in contributing to knowledge and skills outcomes is also recognised.

Figure 1: A knowledge and skills statistics framework (Ministry of Education)



Life-long participation in, and outcomes from education are influenced by a number of individual and contextual factors. At the person level, this includes factors such as resources to support learning, life histories, ethnic and cultural background, personal attitudes, values, expectations and perceptions, and the flow-on effects from other learning experiences. Contextual factors include family/whānau resources to support learning, and the attitudes, expectations and perceptions of important others (such as family/whānau and peers).

These factors affect learning that takes place in both formal and non-formal settings, both directly and interactively. The dynamics of achieving well-being through ongoing acquisition of knowledge and skills sustains learning that contributes to social and economic development in an ongoing cyclic manner. Recognition of inter-dependency of whānau, social, cultural, and economic factors are important for Māori.

As well as teaching and learning from early childhood through adulthood, research and knowledge creation is an important part of the knowledge and skills domain. Tertiary education providers make up a sizable proportion of the research and development sector. They also train the research and development workforce. At degree level and above, teaching is required to be informed by research.

Knowledge and skills contribute to important social and economic outcomes at all levels. Individuals' personal knowledge and skills directly affect their social and economic outcomes, which influence well-being, and collectively these affect wider society and the nation's economic and social development. In turn, the wider social and economic outcomes feed back into the content and resources available for developing and creating knowledge and skills.

Other knowledge and skills frameworks

A closely related concept is 'human capital'. Although this has been explained in many ways, the Organisation for Economic Co-operation and Development defines human capital as:

> the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well being (OECD, 2001, p18).

Human capital is a concept that arose from the study of economics. The term 'capital' was first used to describe physical assets that enable future production, such as buildings and machinery. Capital assets are capable of generating income and have themselves been produced.

Human capital looks at the productive capacity of humans as analogous to that of physical capital (eg productive machinery). People have innate abilities that are augmented by education and training, or even health care (ie, in keeping human capital healthy). Like physical capital, human capital can depreciate over time, as knowledge and skills that have been acquired previously are lost or become obsolete.

Knowledge and skills, as measured by this domain plan, can therefore be seen as investment in human capital – the flows into the stock of human capital. As also indicated in the above model, human capital is thought of as a key determinant of economic growth. To account for this, Statistics NZ's productivity statistics now contain adjustments for the compositional quality of labour (by years of (estimated) experience and qualification level). In addition, distribution of the benefits of economic growth partly reflects the distribution of human capital throughout the economy.

Human capital is embodied in the individual, and the national stock of human capital can therefore be thought of as the sum total of the human capital of all those normally resident in its territory. Researchers have identified three methods for measuring human capital:

- Indicators – using proxies of human capital such as educational attainment or test scores. Of the three methods, this aligns most closely with the available measures of knowledge and skills, and aligns with the data needs specified in topic 1, "What is the distribution and level of different types of knowledge and skills across and within the population?", and topic 2, "How does New Zealand's level of knowledge and skills compare internationally?"

- Cost-based – summing the cost of past investments in human capital by individuals, employers, and government. Computing these costs is a difficult task, confounded by the need to factor in depreciation. The cost of acquiring knowledge and skills is not examined in this domain plan.
- Income-based – summing discounted future income individuals are expected to earn (ie returns to human capital). This method requires the estimation of many variables and is difficult to implement. However, it is related to the research question posed in topic 12, "What are the social and economic outcomes for individuals from their knowledge and skills?"

The OECD Committee on Statistics is currently working with international experts on a project to develop human capital accounts for the purpose of international comparisons (OECD, 2009). An advantage of both the second and third methods listed above is that the measures of human capital are standardised in dollar terms. Those involved in the OECD project agreed that discounted lifetime income is a suitable framework for comparative human capital measures, and the first data will be made available in 2010, thus informing topic 2, "How does New Zealand's level of knowledge and skills compare internationally?"

A final related concept, which overlaps with a subset of the knowledge and skills domain, is 'human resources in science and technology' (HRST), which is important for technological progress and development of knowledge. A framework for identifying HRST is detailed in the OECD *Canberra Manual* (OECD, 1995) which provides guidelines for measuring the stocks and flows of scientific and technological human resources. The *Canberra Manual* defines HRST people as those who have completed university education in a field of science and technology, or if not formally qualified, work in a field were such a degree is usually required. This framework is used to inform the data needs in topic 14, "What is the extent of research and knowledge creation in New Zealand?"

Scope of the knowledge and skills domain

The purpose of this domain plan is to determine the knowledge and skills information needs over the medium term, assess how well current statistical outputs meet those needs, and identify gaps and propose solutions to address these. The scope of the domain plan is informed by the knowledge and skills frameworks outlined in the previous section, and predominantly the model presented in Figure 1.

Information and analyses on knowledge and skills topics provide vital inputs to public policy development and private investment prioritisation in the education market. To assess the magnitude of future knowledge and skills requirements, identify issues and the potential effectiveness of response strategies, it is essential that there is ongoing monitoring and understanding of knowledge and skills attainment and usage. This will mean examining a number of education issues including supply sources; the effectiveness of knowledge and skills to meet economic and individual needs; and measuring the outcomes of implementing knowledge and skills strategies. Additionally, international comparability is often sought by data users for some knowledge and skills statistics.

Formal, non-formal, and informal learning

As stated in the definition, people develop knowledge and skills in many ways and places, and over their entire life-course. The focus of the knowledge and skills is on formal and non-formal learning, because these types of learning tend to be easier to collect and they provide reliable and valid information for the production of official statistics.

Formal learning occurs within the educational system and the national curriculum, which contributes to recognised qualifications. The key characteristics of formal education are that it is taught, the content is structured, and learning is assessed. Formal education plays an important part in the development of knowledge and skills, and this system is most amenable to direct public policy intervention.

Conversely, **non-formal** acquisition of knowledge and skills occurs outside the national curriculum and qualifications framework. Non-formal learning is more common in adulthood, and includes on-the-job learning, community-based education, mentoring, and self-directed learning. The key difference is that non-formal learning does not involve evaluation of level of achievement, but may be structured. In both formal and non-formal learning, the main purpose of the activity is acquisition of knowledge and skills.

Informal learning is not intentional, and characterises learning by very young children. For older children and adults, informal learning happens through experiences at home, on marae, at leisure or at work throughout their life-courses.

The Knowledge and Skills Domain Plan will focus on the learning of mātauranga Māori in formal and non-formal rather than informal settings, in order to understand how mātauranga Māori underpins learning, research, innovation, and social and economic Māori development,.

Individual and aggregate measures

The domain includes both individual level and aggregate measures of educational participation and qualifications, attitudes to and values of learning. Knowledge and skills outcomes by group membership are also important, such as by socio-economic status, ethnicity, or special-needs status. Information on outcomes at both the individual and aggregate levels is necessary to understand the effectiveness of the full system incorporating background factors, resources, activities, and results. While statistics for Māori can often be produced at the iwi level, current data collection methods make it difficult to move to a finer-grained aggregate level, such as measurement of collective knowledge and skills at a whānau or hapū level.

As noted above, the concept of human capital allows levels and flows of the stock of knowledge and skills to be examined at the national level, as well as across population subgroups (such as age cohorts).

Relationship to social and economic outcomes

The domain also covers the relationship between knowledge and skills outcomes and other social and economic outcomes.

At the individual level, there is a body of evidence that affirms the positive relationship between people's knowledge and skills and their economic success and social well-being (measured with proxies such as income).

The returns from increasing knowledge and skills are also evident at the macroeconomic level. A significant part of the differences in long-term economic growth rates between countries is explained by differences in their populaces' education and skills (MacCormick, 2008). There are also wider social benefits, such as increased life expectancy through better health, reductions in crime and poverty, and higher civic and political participation rates.

Institutional components

The domain plan is also concerned with the system of knowledge and skill attainment in New Zealand, and the interaction between the elements and actors in the system. A wide variety of institutions provide educational opportunities, or otherwise enable and support the acquisition of

knowledge and skills, so it is important to understand how these institutional arrangements support individuals acquiring skills and knowledge.

Topics outside of scope

There are topics that are outside the scope of the Knowledge and Skills Domain Plan. These include:

- the demand for workers with different sets of knowledge and skills
- informal learning through general life experiences, such as parenting or participating in leisure and recreation activities
- the total cost associated with acquiring knowledge and skills, both at the micro and macro levels.

The knowledge and skills domain is closely related to the Economic Standard of Living Domain Plan, which is in the final stages of development and will be published in 2010. A review of economic standard of living statistics was consulted upon in 2009, and is available at www.stats.govt.nz. Preliminary scoping of the proposed Paid Work Domain Plan has also identified several enduring topics that cover knowledge and skills from a labour market statistics perspective.

Measurement and data quality issues

Several measurement and data quality issues have been identified for the collection of statistics within this domain.

The most significant issue arises from the fact that there is no standard unit of measurement for assessing the knowledge and skills that an individual possesses. The highest qualification earned is typically used as a proxy, but this is imperfect because people with the same qualification level will still have varying knowledge and skills, and it ignores competencies developed through lower-level qualifications or outside the education system. Occasionally this proxy may not be adequate as some people have high qualifications and low practical skills, and some have no qualifications but high skills (Ministry of Education, 2009a). The former has been found to be more likely for those migrants who have English as a second language. This is of particular interest to New Zealand which has high and rising rates of immigration from non-English-speaking countries.

Comprehensive administrative databases containing information on educational attainment have only been developed recently. It is necessary, therefore, to use household surveys to measure qualifications gained prior to the implementation of the databases. However, there are difficulties in measuring educational attainment through surveys. Formal qualification frameworks have changed over time, and may continue to change into the future, which makes it challenging to write questions that enable respondents to indicate their highest qualification. Changing frameworks or classifications also make it difficult to compare levels of educational attainment back over time, and to create concordances for international comparisons.

Additionally, measures of educational attainment may be confounded by respondents who falsely indicate a higher level of education because of social desirability, or have difficulty recalling their highest qualification. The effect of these issues may vary across survey modes (ie, self-completion, in-person, telephone), affecting the comparability of data collected using different modes.

Test scores are therefore more informative than highest qualification, but it is difficult to create and administer comprehensive tests for all skills, particularly softer, non-technical skills such as

innovation or leadership capability. However, a few surveys developed by the OECD have allowed some skills to be assessed through standardised tests, and these are identified in the next chapter.

The use of highest qualification or participation in education as primary measures of knowledge and skills has resulted in a lack of attention to collecting information on the role of non-formal learning in acquisition of knowledge and skills. Since research and knowledge creation often take place outside the formal education system – in research institutes, private businesses, and iwi enterprises – learning provision and participation will capture only part of total knowledge and skills.

As mentioned in the section on human capital, it is a difficult task to estimate future outcomes from acquired knowledge and skills, but there are economic models that draw on multiple sources to generate data on projected outcomes. Internationally, the OECD is leading a project to develop a human capital satellite account allowing countries to measure human capital with a standardised methodology.

3 Identifying the enduring research and policy topics

Introduction

This section presents an overview of users' main information needs, focusing on enduring rather than short-term needs. It draws on the intelligence gained through developing the Programme of Official Social Statistics, where there was extensive consultation with social sector and population-based agencies to identify enduring research and policy questions.

Formal education is one the most important enablers of human capital formation and therefore is a key contributor to the country's economic and social development. Education provides skills and qualifications that help young people make an entry into the labour market, and also provides additional skills for people who are already in the labour market. Education is also a marker of better social outcomes for individuals. Therefore, measuring knowledge and skills gained through formal education, and the inputs and outcomes from education, are given greater emphasis throughout this domain plan.

The topics in this list explore how the education system works and how it intersects with the economy and with society. These topics have been chosen:

- as enduring research and policy questions
- to pick up matters of policy interest that are of importance now and that are also expected to shape policy thinking over the medium term
- to reflect the knowledge and skills frameworks introduced in Chapter 2.

Level and distribution of knowledge and skills

Topic 1: What is the distribution and level of different types of knowledge and skills across and within the population?

As explained by the Ministry of Education (2008a), there are many reasons why it is important to understand the level and distribution of knowledge and skills across and within the population. The government and taxpayers make very substantial investments in education. In the year ended March 2007, education accounted for 18.6 percent of core government spending, which equated to 5.6 percent of GDP that year (Ministry of Education, 2008b). Students and employers also pay large amounts to participate in formal and non-formal learning (see topics 4 and 5). This investment is justified by the contribution that education makes to individual's well-being (see topic 12) and the economy and society (see topic 13), but it remains essential to monitor the level and types of knowledge and skills generated from this investment. Given the importance of human capital to economic development, there is ongoing policy interest in the distribution of skills and of particular types of skills in the workforce and in the population.

Currently, there are several ongoing data sources that provide estimates of New Zealand adults' and children's knowledge and skills, along with demographic and geographic information for subgroup analyses. Most of this data is in the form of formal

qualifications attained. While not all knowledge and skills are captured by qualifications, they can be a useful proxy to measure skills across the population and outcomes from formal education over time. The Population Census, Household Labour Force Survey (HLFS) and the General Social Survey (GSS) provide information on adults' school and post-school qualifications. Knowledge and skills data from two international one-off surveys, the Adult Literacy and Life Skills Survey (ALL) and International Adult Literacy Survey (IALS), also inform this topic.

International migration also affects the distribution and level of knowledge and skills across and within the population (Docquier & Marfouk, 2004; OECD, 2008), and the census and HLFS can be used to examine qualification attainment of foreign and native-born respondents.

Three ongoing international surveys provide test score data for primary and secondary school aged children: Trends in International Mathematics and Science Study (TIMSS), Progress in International Reading Literacy Study (PIRLS), and the Programme for International Student Assessment (PISA). The National Education Monitoring Project (NEMP) provides information on knowledge and skills of year 4 and year 8 students for subjects across the curriculum.

While the average achievement in New Zealand is high by international standards (see topic 2), there are inequalities in the distribution of levels of achievement. Specific population subgroups are over-represented in the group of lowest achievers, and ongoing data is required to inform and monitor policies designed to redress these differences. The 2011 Disability Survey, currently in development, will provide data that enables a comparison of knowledge and skills outcomes between non-institutionalised disabled and non-disabled adults aged 15 years and over.

The Employment Outcomes from Tertiary Education (EOTE) integrated dataset does contain detailed information on qualifications gained from tertiary education and industry training. Although the number of years of data currently in the dataset is limited (official statistics could only be produced from data from 2003 onwards), it offers the potential for a wealth of data going forwards.

Overall, this topic is reasonably well covered in terms of available data, but a few gaps remain. Information on highest qualifications is at a very broad level; in particular, information on the field of study (ie, subject) is generally not collected, nor whether respondents hold multiple qualifications across fields. The contribution of non-formal learning to knowledge and skills remains difficult to quantify, as does the ability to measure how knowledge is held collectively such as by whānau and hapū.

Human capital estimations could inform this topic. By valuing knowledge and skills in dollar terms, it becomes easier to compare population sub-groups and levels over time. Thus, human capital accounts would permit an examination of the effects of an ageing workforce on the aggregate level of knowledge and skills, and, for example, the impact of the baby-boom generation reaching retirement.

Topic 2: How does New Zealand's level of knowledge and skills compare internationally?

One way of assessing the value we get from investment in education is to see the performance of our system in relation to that of comparable countries. International comparisons are especially important for a small country like New Zealand, because this allows us to monitor the impact of ideas tested overseas. International evidence suggests that an innovative economy and improvements to productivity growth rates depend on a more highly skilled workforce, which is influenced by the quality of the tertiary education we can offer. As a small open economy with a high reliance on land-based resources, we rely on innovation to make the most of our resource base.

Compared with many developed countries, our education system is small. Therefore we have a particular need to see our performance in an international context and to compare our system, its performance, the investment we are making in it, and the return we get from it, with other countries (Ministry of Education, 2008a). This allows the quality and performance of education and training to be gauged using indicators such as outcomes-to-expenditure ratios, student-teacher ratios, or drop-out rates.

In addition to administrative datasets, several surveys noted under topic 1 provide direct comparisons with a range of countries (IALS, ALL, PISA, PIRLS, and TIMSS). Where surveys are conducted regularly, they also help to build up a picture of changes over time, and highlight New Zealand's relative strengths and identify areas for improvement. As the IALS and ALL surveys were one-offs, the validity of these data sources declines over time. Additionally, data on highest qualifications from the census, GSS or HLFS can be used for international comparisons, although comparing qualifications internationally is not always straightforward because of different classification frameworks.

Again, human capital estimations could inform this topic. Producing human capital accounts, using an internationally standardised methodology, would facilitate comparisons with other countries also producing human capital accounts.

Topic 3: What is the level of knowledge and skills required for New Zealand to participate in a global society and economy?

There has been interest expressed in researching how New Zealand's level of knowledge and skills affects participation in the global economy, and whether this is sufficient to remain internationally competitive.

To participate in a global economy New Zealand needs to maintain a high level of knowledge and skills compared with other countries. Globalisation and the increasing wealth and human capital of developing economies have resulted in a surge of highly productive and skilled workers across the world. This means New Zealanders face more competition in the global economy for sustainable and well-paying jobs, and as a country we will have to increase our level of knowledge and skills to maintain a high international standing (see topic 2). As knowledge and skills gained through formal education are the main assets held by young people entering the labour market, it is crucial that qualifications reflect employers' needs.

There is an anecdotal belief that a large number of highly educated New Zealanders have emigrated to countries such as Australia and the United Kingdom, suggesting a substantial loss of human capital. Census data allows this to be tested, and an international analysis shows that more than 15 percent of tertiary qualified New Zealand

born people live overseas (Dumont & Lemaître, 2005). This tends to balanced by immigration of highly educated people (Docquier & Marfouk, 2004; Statistics NZ, 2002, 1999). However, as noted in chapter 2, qualifications are a proxy for knowledge and skills, and the ALL survey results show that highly educated immigrants with English as a second language have lower skill levels.

Attitudes and participation

Topic 4: To what extent do people participate in formal learning?

Changing rates of participation in formal learning opportunities affect the demand for the education professionals, physical resources, and funding levels required to maintain a high-quality educational system. Additionally, tracking participation rates among population sub-groups is necessary for the development of policies or programmes to reduce inequality. For example, young adults with disabilities are less likely to participate in tertiary education, and while Māori participation in tertiary education is high, the majority complete sub-degree programmes (Ministry of Education, 2008c). Retention and qualification completion rates are also an important data need, including by key variables such as ethnicity, qualification level, and age.

Formal learning covers all types of learning that is within the national curriculum or contributes towards a recognised qualification. There are two types of quality-assured qualifications in New Zealand:

- National qualifications provide nationally recognised, consistent standards and qualifications. They give recognition and credit for standards-based knowledge and skills.
- Provider-developed (local) qualifications are those which have been developed by an education provider.

There is rich information on participation in formal learning available from administrative and survey data sources for both adults and children (Ministry of Education: Early Childhood Education Annual Census, Data Collected on Students from the School Sector, Tertiary Education Providers Data Single data return; Tertiary Education Commission Administrative data; the HLFS). As all people enrolled in formal qualifications are issued with a National Student Number (NSN), it is now possible to ascertain the amount of formal education people are undertaking.

Many of these sources contain variables that allow population sub-groups to be analysed, such as disability status, ethnicity, and age. Data on participation in Māori medium education, from pre-school to year 13, is collected by the Ministry of Education. Information on school leavers and tertiary students' qualification completion rates are available from the Ministry of Education.

However, there is less reliable information about children participating in special education, particularly those with moderate rather than high needs (Ministry of Education, 2008c).

Topic 5: To what extent do people participate in non-formal learning?

Non-formal learning makes a significant contribution to knowledge and skills, particularly when many years have elapsed since participating in formal education. Non-formal learning includes work-based training (that does not lead to a formal qualification), mentoring and coaching, and self-directed learning. Funded non-formal learning is only one part of this and also includes industry training outside the National Qualifications Framework (NQF)[1].

However, learning that occurs outside the formal learning system is not particularly visible or well understood, which makes it difficult to value appropriately. Non-formal learning has the potential to provide high value-for-effort returns to individuals and society. It can be tailored to meet the specific learning requirements of individuals outside of the constraints of qualifications and curriculum. Additionally, there are increasing opportunities for self-directed learning with the growth in penetration of the Internet coupled with provision of online education, from hobby courses to access to materials from leading universities. Non-formal learning can also provide a point of re-entry to the formal education system by raising foundation skills and targeting learners whose initial formal education was unsuccessful. Thus, community and work based learning can potentially have high social returns.

Many Māori participate in a range of informal learning through wānanga and hui as well as whānau passing from one generation to the next. The traditional informal methods of sustaining mātauranga Māori is important for such knowledge to continue to exist.

Overall, however, relatively little is known about who participates in non-formal education, how much non-formal learning they undertake, and what benefits they accrue from it. The 1998/99 Time Use Survey collected data on time spent in education or training, including the various modes of learning. This survey is being repeated in 2009/10 and will therefore allow comparisons across time. The 1996 Education and Training Survey (ETS) and 2006 ALL survey also collected data on non-formal learning. The ETS data is now outdated but the ALL survey data will remain valid for about five more years; however, neither survey is scheduled to be repeated. The Māori Social Survey will for the first time give some indication of variables that exist within the Māori population, such as where Māori would go to seek mātauranga Māori learning.

Current data on non-formal education is limited and mostly covers areas that receive government funding, such as adult Community Education provided by schools. Governments have become increasingly cautious about funding non-formal education and require more evidence that provision has real educational, community, and social benefits. There is little information available about wider participation in non-formal learning and the benefits for individuals, communities, and the country of different types and areas of non-formal learning.

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[1] The National Qualifications Framework (NQF) will be replaced by the New Zealand Qualifications Framework (NZQF) on 1 July 2010; the NZQF will encompass the NQF and the Register of Quality Assured Qualifications.

Topic 6: What are the barriers to participation in learning at all levels?

If we are to build human capital as a means of raising social and economic performance, we need to make sure that we realise the potential of our population to the greatest extent possible. This means ensuring that all individuals have access to the sorts of education that are appropriate to their situation, to help them improve their chances of success in the labour market and achieve a better standard of living. Unfortunately, various barriers may prevent people taking up formal and non-formal learning opportunities. These may be different for each sector of the community participating in learning, and may also reflect life stages when participation in learning may be more difficult. Policy makers need to be able to identify barriers to participation, so the government can be advised on strategies to mitigate barriers to access.

Improving chances of life-long success starts with quality early childhood education (ECE) of sufficient duration (see also topic 11). ECE is not compulsory in New Zealand, but there is evidence that time spent in ECE enhances future learning and can help narrow the income gap between children from low income families and those from more advantaged backgrounds (Ministry of Social Development, 2008). Enrolment data shows there are ethnic and socio-economic disparities in ECE participation, so identifying barriers to accessing ECE should be prioritised.

There is existing survey data that sheds some light on barriers to participation by adults aged 15 years and over; however, ongoing monitoring is required to determine if barriers continue to persist. Several surveys conducted in recent years have asked respondents to identify barriers that have prevented them from participating in learning opportunities.

Three surveys provide information on barriers facing respondents from a cross-section of the adult population. The Education and Training Survey provided the most detailed information on barriers to participation in formal and non-formal training, including factors that prevented people from taking up opportunities, made it difficult to complete courses, or caused them to dropout. The ALL survey provided data on barriers to participation in learning opportunities, and the GSS reports barriers for people who stated they were not satisfied with their knowledge and skills and wanted to do further education.

Three other surveys have yielded information on barriers for specific population sub-groups. The Disability and Childcare surveys produced data on whether having a disability or caring for dependent children are barriers to participation. The Health of the Māori Language Surveys provided information on barriers specific to learning te reo Māori.

Of these six surveys, only the GSS and Disability Survey are scheduled to be repeated.

Topic 7: What effect do attitudes, expectations, and perceptions of individuals have on their uptake of learning opportunities?

One priority for our education system is to become more effective, that is, to help raise achievement and improve skill acquisition. Research is needed to uncover the factors that influence individuals' levels of engagement in education and other learning opportunities over time, to increase effectiveness of the educational system. Individuals' attitudes towards participating in education, their expectations regarding the consequences of participation or non-participation, and perceptions of the learning experience are thought to influence knowledge and skills outcomes.

Research has revealed a correlation between attitude towards school and educational outcomes: students who like and are interested in school also tend to achieve better results. Positive attitudes toward school help maximise the learning opportunities provided there, and a higher proportion of those with higher qualifications found their education useful in their work and life in general. Conversely, negative attitudes towards school and poor attendance may be associated with low academic performance, early school leaving, and a disinclination to pursue lifelong learning. Of course individuals' attitudes and beliefs are likely to be shaped by influential others, and data needs regarding the relationship to background influences are outlined in topic 8.

One area of concern for policy makers are youth who are not engaged in education, employment, or training (NEET), as a significant minority of those aged 15–24 years are "missing the opportunity to develop their potential at an age that heavily influences future outcomes" (Department of Labour, 2009b). Research that highlights the attitudes and beliefs of NEET youth could inform policies and interventions designed to increase participation in education and training, and improve their long-term outcomes. This is an important issue for Māori due to the youthful population distribution, and because population projections showing Māori will constitute an increasing proportion of the future workforce. To deliver on aspirations of Māori development through iwi, the Māori community, and the general economy, the disproportionate level of Māori youth non-engagement in education, employment, and training needs to be addressed.

There are surveys that provide data on attitudes, expectations, and perceptions and how these correlate with engagement and participation. Information on the attitudes of school-aged children is available in the international assessments completed by the Ministry of Education, such as the PISA, PIRLS, and TIMSS, as well as the NEMP. The New Zealand Council for Educational Research (NZCER) National Survey of Secondary Schools may also add useful data.

However, less information on the adult population is available to inform this topic, and it is adults who have the greatest number of ongoing educational and training options. The oldest survey in this set is the Social Indicators Survey, conducted in 1980/81, which found an association between negative attitudes and higher levels of dissatisfaction with education attained. Motivations for studying for qualifications were collected in the Education and Training Survey. Current data is found in two sources: the GSS and ALL surveys. The ALL survey provides information on the effects of the attitudes of secondary students on their literacy skills and other life skills as an adult. The GSS collects information on perceived importance of education; this variable could be linked to others in the GSS dataset such as highest qualification, satisfaction with knowledge and

skills, and current training activity, to give a view of the effects of attitudes on uptake of learning or training opportunities.

Background influences

Topic 8: What is the effect of background influences on participation in, engagement with, and outcomes from learning?

As shown in Figure 1, a range of background influences affect individuals' learning experiences and outcomes, including personal, family and government resources, personal and family attitudes and expectations, and a host of other background factors. Research demonstrates the importance of family and whānau engagement in improving participants' outcomes. Parents in particular have a high degree of direct influence on the education of young children; data from the United States shows that children of more highly educated mothers are more likely to participate in early childhood education (Wirt et al, 2002). Beyond this, family environments have a range of ongoing direct and indirect effects on engagement, by providing resources and practical support; and family values establish expectations and influence aspirations. It has also been found that teachers' expectations have a significant impact on knowledge and skills outcomes.

Economic factors also influence people's capacity to engage in learning opportunities; for example, research has shown that poor diets and hunger in low-income families are implicated in poor school performance (Alaimo et al, 2001). It is important to identify background influences that affect participation and learning experiences (such as the effects of learning environments or cultural approaches) so strategies can be put in place to enhance outcomes for all.

Data on engagement and outcomes enables the impact of family and whānau to be measured, as well as when and how it has the most positive influence. The Dunedin and Christchurch longitudinal studies included modules that assessed children's educational experiences, which can be analysed alongside background variables. For example, data from the Christchurch study showed that family aspirations mediate the effect of socioeconomic status on educational outcomes (Fergusson, 2008). Both studies also surveyed participants' teachers, and data may be available to enable an exploration of the effect of teachers' attitudes and beliefs on their pupils' outcomes.

Additionally, there is information on the background of school-aged children in the international assessments completed by the Ministry of Education (including PISA, PIRLS, and TIMSS). For example, PIRLS sends home a questionnaire that asks parents to report "students' early reading experiences, child-parent literacy interactions, parents' reading habits and attitudes, home-school connections, and demographic and socioeconomic indicators" (Mullis et al, 2003, p. 285).

Information on the adult population under this topic is available from the ALL survey, the Social Indicator survey questions of parental qualifications and occupation, and the GSS questions on income. The Survey of Family, Income and Employment Dynamics (SoFIE) is an eight-year, longitudinal survey of a random sample of New Zealanders aged 15 years and over. It can also provide information on this topic by comparing educational attainment with parents' education levels, family status and changes, and family income level.

The National Centre for Lifecourse Research, which incorporates the Dunedin and Christchurch longitudinal studies, and the Competent Learners longitudinal study also hold data on the effect of background influences on adults' participation in learning opportunities. Measures of background influences in some of these surveys include: number of books in the household; parents' highest qualifications, socio-economic status; community characteristics; use of mathematics in the home; family income level; changes in family; household size and mobility; and language.

Topic 9: How are both formal and non-formal types of learning supporting maintenance of te ao Māori, the Māori language, and Māori cultural awareness?

Te ao Māori refers to the Māori world, or colloquially, 'all things Māori'. Māori culture and Māori language are seen as important aspects of community participation and identity. As previously stated, cultural learning is captured in the concept 'mātauranga Māori', which encompasses individual and whānau engagement in learning about the Māori culture and their sources of learning about the culture. Wānanga are expected to lead the education sector in advancing mātauranga Māori at all qualification levels and across all fields of study (Office of the Minister for Tertiary Education, 2009)

Information on māutauranga Māori is important for policy development, as many initiatives are founded on the premise that improving individual, whānau, and community cultural engagement is associated with improved social and economic outcomes. For example, the Ministry of Education (2009b, p14) states, "The strengthening of identity, culture and Māori language are critical ingredients for the success of Māori students in education". Data needs for this enduring topic are particularly relevant to Te Puni Kōkiri's 'Māori Potential Framework', which is designed to identify where and how to support the realisation of Māori potential through development based on Māori succeeding as Māori socially and economically.

The Māori language is a critical component of Māori culture, and is recognised as taonga (treasure) (Waitangi Tribunal, 1989). It is both a means of transmitting Māori cultural knowledge, values, and practices, and a distinct form of Māori cultural knowledge itself. Since the early 1970s, concerns have been expressed about the survival of the Māori language, spurring Māori groups and communities to develop a range of initiatives to revitalise the language (Māori Language Commission/Te Taura Whiri i te Reo Māori, 2001).

There are three ways that the formal education system supports learning and maintenance of te reo Māori:

- kaupapa Māori education in kōhanga reo (early childhood), kura kaupapa (primary), wharekura (secondary) and wānanga (tertiary)
- Māori language units attached to English-medium schools
- Teaching te reo Māori as a second language.

Ministry of Education enrolment data shows that most Māori learners are enrolled in the English-medium system. The Ministry of Education enrolment data also provides information on the uptake of Māori language and cultural learning opportunities in the education agencies.

Traditionally, informal methods were the dominant way in which Māori knowledge was transmitted through generations. Informal methods of teaching and maintaining te ao Māori, te reo Māori, and tikanga (engagement in Māori cultural practices), such as at home or on marae, continue to be critically important for the transmission, maintenance, and sustainability of mātauranga Māori, including te reo Māori, today.

Currently-available official statistics predominantly include information on participation in Māori cultural activities, but don't provide many insights into how different forms of learning help to maintain te ao Māori. For example, the census, Time Use Survey, Te Hoe Nuku Roa, the Cultural Experiences Survey, the Christchurch Health and Development Study, and the Māori Language Surveys contain information on engagement (and non-engagement) with Māori culture and language. These statistics provide limited information on how formal, non-formal, and informal types of learning support the acquisition of Māori knowledge.

It is anticipated that the Māori Social Survey (MSS), currently in development for administration in 2011, will collect information that informs this domain.

Pathways and transitions

Topic 10: What pathways do people take at different times of their lives in order to obtain or upgrade their workplace and life skills, and their qualifications?

Educational pathways for children of primary and secondary school age are largely defined by compulsory participation in formal education, but from the age of 16 there are many different pathways available. Additionally, the changing nature of work, with increased flexibility and frequent job changes, means many people reach transition stages where they seek to acquire new qualifications and skills.

The education system has two primary functions. The first is 'credentialing': providing opportunities for people to gain skills that lead to qualifications that help them enter the labour market. The second is 'upskilling': enabling people who are already in the labour force to acquire additional skills and knowledge. This means that alongside traditional pathways through the education system from secondary school to tertiary education to the workforce, New Zealand needs a lifelong approach to learning.

New Zealand has a tradition of relatively open access to tertiary education and access to student loans, which has enabled many people to study part-time, combining work with study. A host of factors influence choice of learning pathway, and different pathways may suit different people.

One of the main challenges facing governments is to find the right balance between these two functions – credentialing and upskilling – and that requires an understanding of the patterns of participation during people's lives. A longitudinal perspective is needed to inform this topic, and New Zealand is fortunate to have two comprehensive longitudinal studies that inform many domains. The Dunedin Multidisciplinary Health and Development Study and the Christchurch Health and Development Study have both tracked over 1,000 people from birth. Information on the transition from compulsory education to post-secondary education and the labour force has already been collected, as participants are now in their thirties.

An additional longitudinal study will also inform this topic: Competent Children, Competent Learners (conducted by the New Zealand Council for Educational Research) has tracked nearly 500 people since they were about four years of age, and will soon yield information on the transition to tertiary study or to the workforce. However, none of these studies started with nationally representative samples, which may limit the ability to generalise findings.

SoFIE also identifies transitions between spells of labour market activity, education and training participation, and receipt of government income support, and examines the factors that influence transitions from one status to another. SoFIE provides information on older generations that is missing from the other longitudinal studies, and also commenced with a nationally representative sample.

Several administrative datasets are also available to inform this topic. The Student Loans and Allowances integrated dataset, held by Statistics NZ, contains information on student loan borrowers' and student allowance recipients' participation in tertiary education. The Ministry of Education's Transitions dataset, which links together information from NCEA and tertiary enrolments and completions data, may also contain markers that indicate which pathway a person may take to upgrade their workplace and life-skills. The Employment Outcomes from Tertiary Education (EOTE) feasibility study dataset, which integrated tertiary education administrative data with the Linked Employer-Employee Dataset, also contains information on educational pathways, though only for individuals who have participated in tertiary education and training from 2003 onwards.

Outcomes of knowledge and skills

Topic 11: How important is the quality and content of early childhood learning to learning pathways and outcomes?

Children's growth and development are most rapid during their early years and young children learn in a range of settings. International research suggests Early Childhood Education (ECE) is an important part of building the foundation for a child's ongoing learning and development, with regular, ongoing participation in high quality ECE positively influencing future educational achievement (Ministry of Education, 2009b). Data is therefore needed to identify factors that determine the quality of ECE services, so that those services can be enhanced to improve long-term educational outcomes.

There are two broad types of early childhood education services: teacher-led and parent-led (Ministry of Education, 2009c). In teacher-led services, at least half of the adults who educate and care for children must be qualified and registered ECE teachers. This includes kindergartens, education and care centres, and home-based education and care. When parents, family/whānau and caregivers are primarily responsible for educating and caring for children, this is referred to as a parent-led service. This category includes kōhanga reo, playgroups, and playcentres.

Some information measuring how early childhood education affects later learning, education pathways, and outcomes is available. Results from the PIRLS and PISA surveys contain data that enables investigation of the link between ECE participation and achievement in school settings. The Christchurch and Dunedin longitudinal studies also allow the effect of ECE participation on outcomes and pathways to be assessed.

One limitation of all these studies is that they do not allow the effects of quality and content of ECE to be quantified. In order to assess this, quality reports from the Educational Review Office (ERO) and training of education providers may possibly also be utilised and compared with enrolment data to build a full picture of participation in high quality early childhood education.

The primary purpose of the 'Competent Children Competent Learners' longitudinal study was to look at whether (and how) ECE helps children become lifelong learners. As all cohort members were enrolled in ECE, it is not possible to determine the magnitude of the effect of participation versus non-participation. However, differences in outcomes across students enrolled in various types and qualities of education service can be assessed, because quality measures are included in the dataset. One drawback of this dataset is that the nature of ECE has changed since the study commenced, so the applicability of the findings may be limited, and may not provide information on more modern aspects of ECE services.

The Ministry of Education is proposing to allocate National Student Numbers (NSNs) at early childhood. If implemented, this would enable measurement of the value of ECE by comparing longer-term educational achievement with ECE characteristics.

Topic 12: What are the social and economic outcomes for individuals from their knowledge and skills?

Knowledge and skill levels affect individuals' (and family/whānau) economic and social well-being and evidence shows that education is essential for improving outcomes. Developing knowledge and skills has many social and economic benefits, by increasing employment opportunities and income, leading to better health and well-being, and enhancing civic participation. International research indicates that there are also flow-on effects of increased knowledge and skills; for example, when mothers are more highly educated, their children tend to be better equipped for school (Baum & Payea, 2005).

As New Zealand's publicly funded education system is one of the highest areas of government expenditure, policy makers need information that helps them determine how funding should be prioritised. This includes being able to monitor the labour market outcomes for those with different qualifications, to identify qualifications that may be of low quality.

Average earnings generally increase with years spent in education and attainment of qualifications. However, the salary and wage returns vary across disciplines, and more detailed information is needed to understand income gaps (Acemoglu, 2003). Economic outcomes are also affected by labour market trends, which complicate the assessment of returns from different fields of study. For example, wages may increase or decrease because of changes in demand for certain skills by employers or because the supply of those skills changes with fluctuations in enrolment patterns.

Developing knowledge and skills usually requires individuals to invest considerable time, effort, and expense, which are associated with a range of immediate and ongoing opportunity costs. Therefore, measures of social and economic outcomes also need to take these 'negative' returns into account to determine the overall social or economic outcomes.

More information is readily available on economic than social outcomes of knowledge and skills, from the census, Student Loans and Allowances Integrated dataset, the

Household Savings Survey (HSS), HLFS, and SOFIE. Social outcomes are informed by the GSS, Census Mortality Study, National Lifecourse Centre Longitudinal studies, and the New Zealand Health Surveys.

The comprehensive nature of the ALL survey means that data on many related variables is available, which enables more complex analyses of relationships. For example, the links between formal education, non-formal education, literacy and life skills, and economic outcomes have been evaluated, finding that formal and non-formal education predict levels of literacy and life skills, and economic outcomes. This is the only source of information on the economic outcomes of non-formal learning and there is no information available on the social outcomes of non-formal learning.

The EOTE dataset, generated from a feasibility study, links tertiary education (including formal industry training) and employment outcomes, and can be disaggregated by many variables. While the time series is currently limited to only a small proportion of the working age population, it will continue to grow with each passing year.

Furthermore, if the Ministry of Education 'Transitions' datasets were integrated into EOTE, the economic outcomes from secondary school education could also be assessed – enhancing the utility of the dataset in addressing important policy and research questions. Importantly, this would substantially enrich analyses of tertiary education outcomes by allowing innate ability, as indicated by school performance, to be statistically controlled for.

Additionally, EOTE allows the economic returns of qualifications to be measured, and the Student Loans and Allowances dataset contains information on some of the negative returns associated with gaining tertiary qualifications, namely ongoing debt from study.

Topic 13: What is the relationship between the current level (and growth) of knowledge and skills in New Zealand and other social and economic trends?

Governments are interested in knowledge and skills "as resources which can be used to support economic and social development" (OECD, 2001, p. 9). International evidence shows that higher levels of knowledge and skills in the community are associated with higher rates of labour force participation, improved economic productivity (and earnings), higher democratisation, political stability and human rights, and better health and reduced mortality rates. There are also benefits in reduction of poverty, inequality, violence, crime, and drug use. Given that improving social and economic returns to improve well-being is the key purpose of an education system, it is important to learn more about how the education system and work place training build better outcomes, and to explore what works best.

Economic changes, such as shifts in technology or relative importance of different industries, have the potential to alter the demand for different sets of knowledge and skills, so research is needed to monitor the risk of skills obsolescence and job insecurity (OECD, 2001).

The relationship between a population's stock of knowledge and skills and its economic or social outcomes can be investigated by comparing changes in the levels of a variety of measures over time. By comparing data on the level and growth of knowledge and skills with that of economic growth, health, crime rates, or philanthropy, the contribution of knowledge and skills can be approximated. Comparison can also be made with the

results of the various international studies such as ALL, TIMMS, and PIRLS over time, factoring in population growth rates. Econometric models can also be computed; for example, the OECD created economic models using PISA results to relate cognitive skills to economic growth; they showed that '...relatively small improvements in the skills of a nation's labour force can have very large impacts on future well-being' (OECD, 2010, p6).

Research and knowledge creation

Topic 14: What is the extent and value of research and knowledge creation in New Zealand?

Governments in all developed economies have recognised that one key to improved productivity and economic development is a well-functioning innovation system. The country's innovation system is a complex network of research organisations, educational institutes, Māori initiatives, industry associations, financial institutions, and communities. The universities are a particularly important part of the system – both as the sector of the innovation system that produces most of the 'blue skies' research in New Zealand, and as the means of training the innovation workforce. The innovation system relies on a supply of highly skilled workers to support the growth of new ideas, products, processes, and organisations – which in turn create economic, social, and environmental benefits.

Research and knowledge creation cannot be measured directly, but there are three categories of proxies: inputs, outputs, and impacts. The two major classes of inputs are expenditure and personnel. An adequate supply of appropriately trained staff is critical for sustainable, productive economic growth, and the OECD (1995) *Canberra Manual* provides guidance on "… the measurement of human resources devoted to science and technology (HRST)". The Ministry of Research, Science and Technology (MoRST) used this method to produce the report, *Human Resources in Science and Technology in New Zealand* in 1998, using census data. Full time equivalent (FTE) counts of staff engaged in research and development are available from the Performance Based Research Fund (PBRF) dataset and Research and Development Survey (RDS). The RDS also collects information on expenditure (including by purpose), and the PBRF reports external research income. MoRST's RS&T Scorecard collates together data from multiple sources to provide a long-term summary of investment in research, science, and technology.

Measurement of the output of research and knowledge creation that occurs in institutions such as universities is available through the PBRF dataset, MoRST data and through bibliometric databases. The PBRF data and bibliometric data establish the quality of research conducted in tertiary education organisations. The MoRST RS&T Scorecard also contains measures of the sector's outputs. Thus there is reasonable information on the extent of research in New Zealand.

However, comprehensive information on the value and impacts of research activity, and in particular its relationship with economic performance, is not available. There are three partial sources of information in this topic area. One is data on tertiary education organisations' research contract income. The second is the analyses done by MoRST of the impacts of its research funding. The third is the research and development section of the Statistics NZ Business Operations Survey, which recently replaced the Innovation

Survey, and asks questions on business research and development activities and spending. This captures how many businesses engage in research and development, and the amount spent on R&D.

Of those three partial sources, the least well-developed is the first, because it isn't possible now to measure the extent to which research contract income in tertiary education organisations has been derived from businesses (which means that it is making a direct contribution to a firm's business).

4 Data sources

Introduction

This chapter contains a matrix which lists the main sources of information that currently provide data on the knowledge and skills topics.

Data source matrix

The aim of this matrix is to identify which topics are well covered and which are not. The circles identify where a survey or data source provides information on some or the entire topic question but does not imply magnitude of coverage.

Solid circles indicate that the data source provides information that informs an enduring topic. Hollow circles are used in some fields for the Household Labour Force Survey supplements. These indicate where data across topics can be linked, but show the supplement did not collect new information; if the supplement provides information on an enduring topic beyond the HLFS questions, then a solid circle is used to show this.

The row totals count how many enduring topics are informed by each data source, and the column totals show how many data sources there are for each enduring topic. The hollow circles in the HLFS supplements are not counted in this row and column totals.

For more detail on the each of the surveys and data sources see Appendix 2.

Table 2: Data source matrix

Data source and type	Enduring topic number														Total no. of topics inform-ed by source
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Ongoing surveys															
Trends in International Mathematics and Science Study (TIMSS)	●	●					●	●					●		5
Programme of International Student Assessment (PISA)	●	●					●	●					●		5
Progress in International Reading Literacy Study (PIRLS)	●	●					●	●			●		●		6

Data source and type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
National Education Monitoring Project (NEMP)	●						●	●				●			4
NZCER National Survey of Secondary Schools							●								1
Population Census	●	●	●	●								●	●	●	7
Household Labour Force Survey HLFS)	●	●	●	●								●	●		6
New Zealand Income Survey (HLFS Supplement)	○	○	○	○								●	○		1
Survey of Family, Income, Employment Dynamics (SoFIE)	●			●				●		●		●			5
Household Economic Survey (HES)	●			●								●			3
General Social Survey (GSS)	●			●			●	●				●			5
Household Disability Survey	●			●		●						●			4
Business Operations Survey					●									●	2
Research and Development Survey														●	1
NZVCC Graduate Destinations Survey (now ceased)												●			1
Te Hoe Nuku Roa	●			●					●			●			4
Dunedin Multidisciplinary Heath and Development Study								●	●		●	●			4
Christchurch Health and Development Study								●	●		●	●			4

Data source and type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Competent Children Competent Learners				●			●	●		●	●	●			6
University Graduate Destinations Survey												●			1
New Zealand Health Survey												●			1
Youth 2000							●		●						2
One-off surveys															
Adult Literacy and Life Skills Survey (ALL) 2006	●	●	●	●	●	●	●	●				●	●		10
International Adult Literacy Survey (IALS) 1996	●	●	●	●	●	●	●	●				●	●		10
Education and Training Survey 1996 (HLFS Supplement)	○	○	○	●	●	●	●					●	○		5
Childcare Survey 1998 (HLFS Supplement)	○	○	○	○	●	●					●	○	○		3
Childcare Survey 2009 (HLFS Supplement)	○	○	○	○	●	●					●	○	○		3
Survey of Working Life 2008 (HLFS Supplement)	○	○	○	○	●					●		○	○		2
Culture Experiences Survey 2002 (HLFS Supplement)	○	○	○	○					●			○	○		1
Survey of Older people 2000 (HLFS Supplement)	○	○	○	○								●	○		1
Time Use Survey 1998/99	●	●		●	●										4
Time Use Survey 2009/10	●	●		●	●										4

Data source and type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Longitudinal Immigration Survey 2007-2009 (LisNZ)	●		●									●			3
Household Savings Survey (HSS) 2001	●											●			2
Health of the Māori Language Survey 2001				●	●	●	●		●			●			6
Health of the Māori Language Survey 2006				●	●	●	●		●			●			6
Social Indicators Survey 1980/81	●			●	●		●	●			●				6
Administrative datasets															
MOE enrolment and attainment data				●					●						2
Education Statistics of New Zealand	●			●					●		●				4
Annual early childhood education child and staff return				●					●		●				3
Tertiary Education Providers Data	●			●						●					3
Record of Achievement	●			●											2
Community Education Provided by Schools					●										1
Student Loans and Allowances data set (SLA)				●								●			2
Employment Outcomes of Tertiary Education (EOTE)				●						●		●			3
Ministry of Education Transitions Dataset										●					1

Education Review Office data											●				1
Benefit Data												●			1
Work and Income Training courses					●							●			2
Performance Based Research Fund (PBRF)														●	1
Reports															
OECD's Education at a Glance- international comparisons		●	●	●								●	●		5
Social Report (annual since 2001)	●	●		●							●		●		5
Review of Measurement of Human Capital	●											●	●		3
Human Capital Statistics	●			●								●		●	4
Pathways to Sustainable Employment										●					1
Labour Market Outcomes for Young Graduates										●					1
New Zealand schools sector report	●			●			●	●							4
Different Tracks										●					1
Census Mortality Study												●			1
A Profile of Immigrant Populations in the 21st Century: Data from OECD Countries	●	●	●									●	●		5
OECD Education of the immigrant population	●	●	●												3

Skills and education: How well do educational qualifications measure skills?	●														1
Community and Family Influences on Children's Achievement								●							1
Pathways in Tertiary Education 1998-2002										●					1
Financing education – Investments and returns													●		1
Ministry of Education Profile & Trends	●	●	●	●	●							●			6
Tertiary Education Strategy Monitoring Reports	●	●	●	●	●							●			6
Human Resources in Science and Technology in New Zealand														●	1
Research and Development in NZ: A decade in review 1994-2004														●	1
MoRST RS&T Scorecard														●	1
Surveys in development															
Māori Social Survey	●					●	●		●						4
Longitudinal Study of University Graduates												●			1
Total	31	15	10	29	16	9	16	14	11	10	11	35	12	8	

5 Gaps and recommendations

Gap analysis

Topics in the knowledge and skills domain are informed by a wide range of existing data sources which provide substantial information. However, as outlined in Chapter 1, there are many conceptual problems around measuring knowledge and skills. An abundance of information exists for a number of topics. However some topics, outlined below, have only limited information available. Collection of information for some topics, such as participation in non-formal learning, is inherently difficult due to the nature and context of the information desired. The introduction of administrative and longitudinal datasets has enhanced the coverage for some topics, such as participation in and economic outcomes from formal education.

A gap analysis was undertaken after reviewing all existing data sources and considering how these informed the enduring data needs (see Table above).

Extent of gaps in current information

A summary of the extent of gaps in current information sources for each enduring topic is presented in table 1, chapter 1. While many enduring topics are reasonably well informed, there are some topics with moderate or large information needs.

Almost all existing data sources cover formal education and recognised qualifications, as this tends to be easier information to collect. While knowledge and skills are obtained in formal education, it is not the only area of people's lives where knowledge is acquired. The Time Use Survey (TUS), Adult Literacy and Life Skills Survey (ALL), and Education and Training Survey (ETS) are the only sources to cover participation in non-formal learning, and only the TUS is being repeated. While a statistical standard for qualifications was introduced following the establishment of the New Zealand Register of Quality Assured Qualifications in 2003, the definition, measurement, and classification of non-formal learning remains problematic and costly.

There is very limited information available on the social outcomes of education and training for individuals. Most educational administrative datasets only collect information for the period of participation and lack systematic follow up of students, although creating integrated datasets overcomes this limitation. Historically the New Zealand Vice Chancellors' Committee and a number of other tertiary providers conducted graduate outcome surveys; however, response rates were low and surveys are not consistent.

New information has become available on the outcomes of education and training for individuals, along with information on field of study and economic relevance of the qualification. The continual development of administrative collections such as the Student Loans and Allowances (SLA) integrated dataset provides good quality longitudinal data on economic outcomes for at least 20 years after students have completed their education. However, this information is only available for those who have had a loan or allowance.

The Employment Outcomes of Tertiary Education (EOTE) dataset combines tertiary education and industry training data with Statistics New Zealand's Linked Employer

Employee Dataset (LEED), which contains data on income, transitions, job tenure, and multiple job-holding for employees and the self-employed. This also provides data on the economic and labour market outcomes of tertiary education.

Both the EOTE and SLA datasets have been able to close some gaps on information for work-based training and education, non-formal education, and transitions between education and work. These datasets, which record multiple qualifications, have also been able to close a gap in the pathways topic area where survey information recorded only the highest qualification as standard practice.

There is a dearth of information on attitudes to education and learning in the adult population. The only current source of information is the General Social Survey (GSS) question that asks respondents to state how important they believe education is.

For Māori, information continues to be predominantly about Māori as individuals aggregated into a sub-population (either all Māori or iwi) rather than information about Māori as collectives (whānau and hapū) or for Māori as they deem necessary, such as the importance of a tikanga based approach to learning models.

Analysis of qualifications data across and within the census and national surveys is severely limited by a lack of consistency of questions and classifications. The current minor review of qualification data standards and classifications is attempting to address operational issues and inconsistencies. However, it is difficult and costly to code qualifications for people of all ages using the classification system, so is infrequently used.

Overall, many information sources for the domain topics have been identified, and progress continues to be made, with data sources in various topics becoming even richer. Extended use of longitudinal data, such as the SLA and EOTE integrated datasets, and the Christchurch and Dunedin Health and Development studies, will continue to improve understanding of pathways, outcomes and other enduring topics.

External factors

Changes to the qualifications system over the last ten years, and the increased value of formalised qualifications, make it difficult to compare educational attainment back over time. The improved collection of individual participation and attainment data from senior secondary school years onward, with the implementation of a single national student number, as well as integration of education, student allowance and loans data will provide a much richer and more consistent longitudinal dataset in the future. However it will take 10 to15 years for this data to fully mature.

Thus, the quality and usefulness of education information has been improved recently with the:

- improved collection of individual participation and attainment data from senior secondary school onwards, providing a broad picture of the secondary school system
- implementation of a single national student number (NSN) in 2001, which allows all students information to be tracked and therefore facilitates longitudinal analysis

- integration of the student loans and allowances dataset which will reach maturity in 10 to 15 years and will provide a longitudinal dataset for looking at economic outcomes of those who borrow in order to study
- development of standardised core knowledge and skills questions for Statistics NZ's household surveys.

Recommendations

Priority 1: Move Employment Outcomes from Tertiary Education (EOTE) into production

The Employment Outcomes of Tertiary Education Feasibility Study was a joint project between Statistics NZ, the Department of Labour, Ministry of Education, Inland Revenue and Tertiary Education Commission. This project produced a dataset that integrates administrative data from tax and education records from 2003 to 2006 of sufficient quality to produce official statistics. It has the potential to inform many enduring topics by providing statistics and a research dataset that would allow longitudinal analysis of the economic outcomes of participation in formal learning, including pathways and transitions. Furthermore, because the dataset is comprehensive and detailed, it can be disaggregated to provide new insights. Further information about the EOTE dataset is available at www.stats.govt.nz.

Lead agency	Statistics NZ
Frequency	Annually
Objectives of the collection	Information from the integrated dataset could be used to inform on earnings experiences of recent participants in tertiary education and industry training. Longitudinal information on income levels with people completing tertiary education and industry training will be of interest
Population	Every student enrolled with a tertiary education provider and every person participating in industry training
Data collected (key variables)	Sex, age, ethnic group, type of tertiary institution at which enrolled, programme in which enrolled, qualification(s) in which enrolled, completion status, earned income, main source of income, industry of employer, main firm size, programme category, programme level, highest qualification, Industry Training Organisation
Topics Addressed	4,10, and 12

Priority 2: Add the Ministry of Education 'Transitions' dataset to Employment Outcomes from Tertiary Education (EOTE)

The Ministry of Education Transitions dataset contains records of secondary school students. Adding this to the EOTE dataset would enable secondary school performance from years 11 to 13 to be related to tertiary and workforce participation and outcomes, beginning with students who completed NCEA level 3 in 2005. Actioning this priority would inform monitoring of the transitions from school to tertiary education and work,

and in particular, better identify young people who are not successful in this regard. Eventually, it will be possible to incorporate data from early secondary, intermediate, and primary school.

Adding the Transitions dataset to EOTE would also allow innate ability to be statistically controlled for in analyses on the outcomes for students of tertiary education and training.

Lead agency	Statistics NZ
Frequency	Annually
Objectives of the collection	To give a complete picture of transitions from secondary school to tertiary education and the workforce
Population	All New Zealanders who have enrolled in NCEA subjects
Data collected (key variables)	As well as those in EOTE above, type of course, subject, achievement at secondary school, transitions to tertiary training and labour force
Topics Addressed	4, 10, and 12

Priority 3: Develop data sources which have information on tertiary education sector income for research and knowledge creation

There are established methods for analysing the quality of research outputs. But there is relatively poor information on the impact and outcomes of research activities, especially university research. Yet the most important priority in research policy relates to the extent of transfer and commercialisation of research findings. One good proxy for research impact is the extent to which businesses commission research – because businesses will only pay for research if they see a commercial value in the outputs. Information on sources of research income is not readily available, although some information on business expenditure on research and development is available.

Lead agency	Ministry of Education
Frequency	Annually
Objectives of the collection	To understand which parts of society and economy research and knowledge creation in the tertiary education sector is contributing to, by looking at their sources of research income
Population	New Zealand universities
Data collected (key variables)	Income for research and knowledge creation by source group (eg industry, central government departments, local government, government research funding, iwi, community, other) with internal and cross university transfers netted out
Topics Addressed	14

Priority 4: Combine quality measures of early childhood education with enrolment data

While the early childhood education topic (ECE) is reasonably well covered, most of the information is geared towards participation rates in ECE, which is only part of the picture. In order to assess progress towards the goal that every child has access to quality ECE, it is necessary to add information on the quality of ECE to participation rates. Quality reports from the Educational Review Office and training of education providers could be linked to enrolment data, to build a full picture of participation in, and quality of early childhood education.

The Ministry of Education is proposing to allocate National Student Numbers (NSNs) at the early childhood stage. If implemented, this would enable measurement of the value of ECE by comparing longer-term educational achievement with ECE characteristics.

Lead agency	Ministry of Education
Frequency	Annually
Objectives of the collection	To assess the quality of Early Childhood Education, and the number those with access to high quality ECE
Population	ECE providers and those enrolled in ECE
Data collected (key variables)	The ERO reports give an overall rating of the quality of the education provider
Topics Addressed	11

Priority 5: Expand the General Social Survey (GSS) learning question to include information on formal and non-formal learning

There is far less information available in the knowledge and skills domain on non-formal learning. This is an inherently difficult topic to collect data on and it is likely that administrative data will never be available to provide this kind of information. However, one way of improving available information is by measuring participation in non-formal and formal learning in the General Social Survey. The GSS asks participants if they are currently doing any study or training (referring to both formal and non-formal) but it is not possible to distinguish between the two. Modifying the study questions from the fourth survey iteration (2014) to produce information on non-formal learning would provide data on the proportions of the population learning outside of the formal education system.

Lead agency	Statistics NZ
Frequency	Two-yearly
Objectives of the collection	To assess participation in formal and non-formal learning, and link this to social and economic outcomes
Population	All New Zealanders
Data collected (key variables)	Current participation in formal and non-formal learning opportunities
Topics Addressed	4, 5, 7, and 12

Priority 6: Move to better consistency between Statistics NZ's household survey education questions

Statistics NZ's household surveys, including the population census, address many data needs. However, because knowledge and skills questions are asked in different ways, it is difficult to compare knowledge and skills statistics collected across surveys and over time.

Statistics NZ is currently working on a 'core' demographic module that would ensure a host of variables are collected consistently. Two questions in the proposed core relate to educational variables: highest qualification and current participation in study.

Beyond this, however, it is recommended that other knowledge and skills variables are also collected using consistent methods in new and re-developed surveys.

Lead agency	Statistics NZ
Frequency	N/A
Objectives of the collection	To ensure consistency of knowledge and skills questions asked in social surveys
Population	All New Zealanders
Data collected (key variables)	Highest school qualification, highest post-school qualification, current participation in formal education, current participation in non-formal learning
Topics Addressed	1, 2, 4, and 5

Priority 7: Repeat the 1996 Education and Training Survey (ETS) as a supplement to the Household Labour Force Survey (HLFS)

The ETS informed several enduring topics, including those for which there is less information for adults, such as the effect of attitudes on uptake of learning and barriers to participation. However, this data is out-of-date and cannot be used to inform current policy information demands.

Lead agency	Statistics NZ
Frequency	Five-yearly
Objectives of the collection	1. To investigate the socio-demographic and educational profiles of those people who: • have participated in education and vocational (work related) training in the last 12 months and/or those currently participating; and • have not participated in education or training. 2. To investigate the characteristics of the training and education being undertaken by people in the last 12 months 3. To investigate the factors which discourage participation in education and training for those participating and not participating in the last 12 months 4. To investigate expected outcomes for both those participating and not participating in education and training.
Population	All New Zealanders aged 15 to 64 years
Data collected (key variables)	Gender, age, ethnicity, highest qualification, number of qualifications, labour force status, occupation and industry, income, participation in formal, non-formal and government sponsored education and training in past 12 months, reason for learning, barriers or difficulties while learning, desired training, support from employer
Topics Addressed	5, 6, 10, and 12

Priority 8: Join the OECD Programme for the International Assessment of Adult Competencies (PIAAC)

The Adult Literacy and Lifeskills (ALL) survey provided valuable data not available from other sources, and research on this data continues to produce new insights. However, the information captured by that survey will be out of date by approximately 2016, and will leave a considerable gap in knowledge and skills statistics. Therefore, it is important to plan for the implementation of a new data source. New Zealand is not participating in the first wave of PIAAC, which begins in 2011. It is anticipated that second wave will begin in 2021, and will produce data that replicates and extends the information gained from the ALL survey.

Lead agency	Ministry of Education
Frequency	10-yearly
Objectives of the collection	To measure the knowledge and skills of adults not captured by highest qualification, facilitate international comparisons, provide insights into how skills relate to social and economic well-being of individuals and nations, and measure how education and training systems are meeting skill demands
Population	All New Zealanders
Data collected (key variables)	Literacy, numeracy, work-place skills, competencies in technology-rich environments, problem solving skills,
Topics Addressed	1, 2, 3, 4, 5, 6, 12, and 13

Table 3 Difficulty of implementing recommendations, and relative importance

Recommendations	Difficulty of implementation	Relative importance
		H M L
Move Employment Outcomes from Tertiary Education into production	Medium	
Add the Ministry of Education 'Transitions' dataset to Employment Outcomes from Tertiary Education	Medium	
Develop data sources which have information on tertiary education sector income for research and knowledge creation	High	
Combine quality measures of early childhood education with enrolment data	High	
Expand the General Social Survey learning question to include information on formal and non-formal learning	Medium	
Move to better consistency between Statistics NZ household survey education questions	Medium	
Repeat the 1996 Education and Training Survey as a supplement to the Household Labour Force Survey	Medium	
Join the OECD Programme for the International Assessment of Adult Competencies	High	

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Appendix 1 Glossary

Capital stocks: The measurable quantity of a resource that is both accessible and available for use at a particular moment in time.

Capital flows: Activities that cause changes in stocks (additions or reductions) from one period to the next. Flows are a record of resource production and consumption.

Formal, non-formal, and informal learning: Learning opportunities can be categorised as formal, non-formal, and informal. Formal learning is developed within a national curriculum and/or contributes towards the recognised qualifications framework, while non-formal learning occurs outside of a national curriculum and/or recognised qualification. Participating with an intention to learn, from the learner's point of view, is common to both formal and non-formal learning, but not informal learning. Informal learning happens through experiences at work, at home, and at leisure throughout the life-course.

Both formal and non-formal learning can be divided into situations where students are enrolled with an education provider (early childhood, school, or tertiary) and situations where students are learning at work or in the community. People, families, and communities also undertake a range of everyday activities that lead to self-directed learning.

The category of formal learning is consistent with the Education Division of the Australian and New Zealand Standard Industrial Classification (ANZSIC), and qualifications are classified using the New Zealand Standard Classification of Education (NZSCED).

Full-time equivalents (FTE): A measure of student enrolments in a way that is comparable across institutions.

Funded and non-funded: The government largely invests in formal education through the funding of early childhood education providers, schools, tertiary education providers, and industry training organisations. The government provides some funding for non-formal education, such as adult and community education. Non-formal education is also funded through community and charitable funds.

Full-time teacher equivalent (FTTE): One full-time teacher equivalent is a teacher employed for a full working week. At schools an FTTE is calculated by adding together class contact hours, dividing by 25, and rounding to two decimal places.

Human capital: "The knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being." (OECD, 2001, p18).

Knowledge and skills: The abilities, talents, and knowledge that individuals acquire through engaging in learning in both formal and non-formal settings and through other life experiences.

Māori-medium education: Students are taught curriculum subjects in both Māori and English (bilingual) or in Māori only (immersion) as well as learning te reo Māori.

Te ao Māori: Literally 'the Māori world', the Māori perspective; knowledge of Māori customs, culture, history, and language.

Appendix 2 Sources of knowledge and skills data

The purpose of Appendix 2 is to provide an overview of existing data sources and statistics on knowledge and skills that are currently available from the Official Statistics System. It also assesses their impact on enduring information needs.

Compared with other domains, a relatively high proportion of data is from non-Statistics NZ data sources.

This appendix gives details about the following data sources:

Ministry of Education

- Early Childhood Education Annual Census
- Annual Early Childhood Education Child and Staff Return
- Competent Children Competent Learners
- Data collected on students from the school sector
- School leavers
- Transitions dataset
- School enrolment projections
- Data on teaching staff collected from the school sector
- Trends in International Mathematics and Science Study (TIMSS)
- Progress in International Reading Literacy Study (PIRLS)
- Programme for International Student Achievement (PISA)
- National Education Monitoring Project (NEMP)
- Tertiary education providers data – Single data return
- Adult Literacy and Life Skills (ALL) Survey and International Adult Literacy Survey (IALS)

New Zealand Qualifications Authority

- Record of achievement
- NCEA statistics

Education Review Office

- School and ECE provider reviews

Tertiary Education Commission

- Tertiary Education Commission administrative data
- Performance-Based Research Fund (PBRF) data
- Community education provided by schools

Statistics New Zealand

- Census of Population and Dwellings (Census)
- Household Labour Force Survey (HLFS)
- New Zealand Income Survey (NZIS)

New Zealand Childcare Survey

Education and Training Survey (ETS)

Survey of Working Life

Survey of Family, Income, and Employment Dynamics (SoFIE)

Longitudinal Immigration Survey of New Zealand (LisNZ)

General Social Survey (GSS)

Household Economic Survey (HES)

Time Use Survey (TUS)

Household Savings Survey (HSS)

Cultural Experiences Survey

Māori Social Survey (MSS)

Household Disability Survey

The New Zealand Survey of Older People in 2000

Integrated Data on Student Loans and Allowances (SLA) dataset

Employment Outcomes of Tertiary Education (EOTE) dataset

Business Operations Survey

Research and Development Survey

Social Indicators Survey

Te Puni Kōkiri

Survey of Attitudes, Values and Beliefs about the Māori Language

Survey on the Health of the Māori Language (2001)

Survey on the Health of the Māori Language (2006)

Ministry of Social Development

Benefit data

Benefit dynamics data

Work and Income training courses

Other providers of knowledge and skills data

New Zealand Vice Chancellors' Committee (NZVCC) – University Graduate Destinations Survey

Ministry of Women's Affairs – Longitudinal Survey of University Graduates

University of Otago School of Medicine – Dunedin Multidisciplinary Health and Development Study

University of Otago School of Medicine – Christchurch Health and Development Study

University of Otago – Longitudinal Study of University Graduates

University of Otago Wellington School of Medicine – Census Mortality Study

Massey University – Best Outcomes for Māori / Te Hoe Nuku Roa

Ministry of Health – New Zealand Health Survey

Auckland University – Youth 2000

Ministry of Education

Early childhood education annual census

Lead agency	Ministry of Education
Collection type	Census
Frequency	Annual at July each year
Unit of measurement	All licensed and licence-exempt early childhood centres/services
Coverage	Total New Zealand
Size	180,910 enrolments in 4,890 licensed and non-licensed early childhood services in July 2009
Fieldwork	The Education Information and Analysis Group of the Ministry of Education collects data from licensed and licence-exempt early childhood education services, including kindergarten, playcentre, kōhanga reo, home based networks, and education and care centres
Key variables	Number of children, age, sex, ethnic group, number of teaching staff, highest qualification held by teaching staff
Relationship to information needs	Topics 5, 9, and 11
Notes and limitations	Children who attend more than one childcare centre will be double-counted in this information. When compared with population figures, apparent participation rates do exceed 100% for some groups, suggesting that double counting does happen and may happen to an extent sufficient to cause data interpretation problems. The returns provide aggregated information only. Data quality for licence-exempt services is poor.

Annual Early Childhood Education Child and Staff Return

Lead agency	Ministry of Education
Collection type	Administrative dataset
Frequency	Annual
Unit of measurement	Every student participating in ECE, staff, centre
Coverage	All New Zealand licensed kindergartens, licensed play centres, licensed education and care services, home-based care networks, playgroups, and The Correspondence School
Size	190,907 children, 4,479 centres, and 15,192 staff at licensed ECE centres; 4,153 staff at home-based care networks as at 1 July 2007
Fieldwork	Administrative form sent to all early childhood education services for completion in July each year
Key variables	Child: gender, ethnic group, age, enrolled hours, iwi affiliation

	Staff and centre: gender, ethnic group, qualifications, language of communication, registration, recruitment, relationship with schools, additional services
Relationship to 0information needs	Informs topics 5 and 11
Notes and limitations	

Competent Children Competent Learners

Lead agency	New Zealand Council for Educational Research (with funding from the New Zealand Ministry of Education)
Collection type	Longitudinal survey (commenced 1993)
Frequency	Roughly biennial
Unit of measurement	Individuals (with proxy responses from parents/caregivers in younger years)
Coverage	Wellington region
Size	About 500 young people
Fieldwork	Follows a group of children from near 5 years if age with data collection at 6, 8, 10, 12, 14, and 16 years
Key variables	Participation in early childhood education, skills and aptitude test results at each age, family income levels, changes over time, changes in families, how children initially took to school, how they used their time, how long they spent watching TV at 5 years of age, and their use of mathematics in the home
Relationship to information needs	Topics 4, 5, 7, 8, and 11
Notes and limitations	The information from this project is facilitating a large amount of research on the development of children, but the small non-national sample size limits its applicability nation-wide A further phase is currently underway collecting data from the sample of young people at 20 years of age

Data collected on students from the school sector

Lead agency	Ministry of Education
Collection type	Administrative data
Frequency	Twice a year
Unit of measurement	Students attending the school for tuition
Coverage	All New Zealand
Size	745,148 FTE enrolled students in 2,560 schools in March 2009
Fieldwork	Data is collected as a snapshot as at 1 March and 1 July, by the Education Information and Analysis Group. March data is used mainly for schools' resourcing purposes and the July

	data is used for analysis and reporting
Key variables	March returns *Regular students*: gender, adult students, alternative education students, international fee paying students *Māori-medium education*: total number by level of immersion and year of schooling *School leavers*: secondary leavers by highest attainment, year of schooling, gender, and ethnicity July returns *Regular students*: age, gender, year of schooling, ethnicity, type of school, type of student, and nature of attendance (full/part-time) *Adult students*: gender, year of schooling, nature of attendance *International students*: gender, year of schooling, country, type of student (international fee paying, exchange) *Ethnic group*: age and gender *Māori language learning/Māori medium education*: total number of students, number of Māori students, level of learning, and year of schooling *Pacific-medium education*: Number by language, level of immersion and year of schooling *Early childhood attendance of year 1 students*: type of early childhood service attended by ethnicity *Students in special schools*: Number by gender, age, year of schooling, type of special education provision, and ethnicity *Subject enrolments*: Subjects taken by secondary students by year of schooling and gender
Relationship to information needs	Topics 1, 4, 5, and 9
Notes and limitations	The roll includes students who are suspended for a period, attending a health camp or hospital class, or temporarily overseas. Students who attend more than one school are counted on the roll where the majority of instruction occurs (efforts are made to eliminate double counting). The school roll does not include those who are home-schooled, but there is a separate collection relating to children being home-schooled. All roll numbers in the March returns are measured in full-time equivalents (FTEs). The information is provided in the form of aggregate tables, not unit record data. The March data is mainly used for

	schools' resourcing purposes, while the July data is used more for analysis and reporting.

School leavers

Lead agency	Ministry of Education
Collection type	Integrated dataset of administration data that incorporates school leaver data with attainment data
Frequency	Annual
Unit of measurement	School leavers
Coverage	All New Zealand
Size	56,670 school leavers from 498 schools in 2007
Fieldwork	Data is collected in March by the Education Information and Analysis Group, and relates to the previous schooling year
Key variables	Highest qualification, age, sex, ethnicity, school decile
Relationship to information needs	Topics 1, 2, and 4
Notes and limitations	This is data provided by schools each year about the highest qualification of students who have left school. There is no information on whether the student has entered further education. Up until 2007 this was aggregate information; from 2008, unit record data is available

Transitions dataset

Lead agency	Ministry of Education
Collection type	Longitudinal dataset
Frequency	Annual (since 2005)
Unit of measurement	Students
Coverage	All New Zealand
Size	All students
Fieldwork	This dataset is constructed using the National Student Number (NSN), to link administrative data from NZQA, TEC, Ministry of Education, and tertiary providers.
Key variables	Leaving year and age, ethnic group, highest school qualification, school decile, type of tertiary study, level of tertiary study, tertiary study type (ie full or part time).
Relationship to information needs	Topics 4 and 10
Notes and limitations	Students who leave school with no qualifications are excluded from the dataset.

School enrolment projections

Lead agency	Ministry of Education
Collection type	Survey
Frequency	Annual
Unit of measurement	Number of students attending the school for tuition
Coverage	All New Zealand
Size	N/A
Fieldwork	Projections are based on data collected as a snapshot as at 1 July by the Education Information and Analysis Group, and projections are based on small area population data supplied by Statistics NZ
Key variables	*Regular students*: number by year of schooling for primary and intermediate; FTE by year of schooling for composite and secondary. *Adult Students*: FTE by year of schooling. *Māori medium education*: number of students (Māori and non-Māori) by level of learning
Relationship to information needs	Topics 4 and 9
Notes and limitations	This information is used for short-term planning, new classrooms, etc

Data on teaching staff collected from the school sector

Lead agency	Ministry of Education
Collection type	Survey
Frequency	Annual
Unit of measurement	Teaching staff
Coverage	All New Zealand
Size	2,560 schools in March 2009
Fieldwork	Data is collected by the Education Information and Analysis Group, via the March roll return, the July roll return, and derived from teacher payroll data
Key variables	State schools *Actual staff employed* (teacher payroll data): tenure, gender, designation, age group, salary scale, and mean salary *Teacher mobility survey* (July roll return): resignations, reasons for leaving, new teachers, and movement between schools *Staffing vacancies* (March roll return) *Full-time permanent teachers*: number of vacancies, number re-advertised, reasons for vacancies, and how position is

	covered *Limited term appointments*: degree of difficulty in obtaining limited term staff for full and part-time positions and casual relieving *Beginning teachers* (teacher payroll data): number by gender, tenure, FTTE, training institution, year diploma completed, type of school where employed *Supernumerary teachers*: (teacher payroll data) number Private schools (teacher payroll data) Full-time, part-time, and FTTE by gender
Relationship to information needs	Topic 1
Notes and limitations	This information is used for forecasting teacher supply and demand, and identifies where there are staff shortages

Trends in International Mathematics and Science Study (TIMSS)

Lead agency	Ministry of Education (under auspices of the International Education Authority (IEA) and led internationally by Boston College's Lynch School of Education, International Study Centre)
Collection type	International comparative study
Frequency	Every four years (since 1994)
Unit of measurement	Year 5 and year 9 students, their teachers and principals
Coverage	Sample of New Zealand Schools and a random sample of a group of students from each sampled school
Size	4,940 year 5 students from 220 schools in 2006/07; 3,800 year 9 students from 390 schools in 2002/03
Fieldwork	Data is collected by the MoE Research Division, with tests administered by staff at each school
Key variables	Student achievement in mathematics and science, student's beliefs about the subjects, attitudes, curricular intentions, school and classroom environments, family and home contexts
Relationship to information needs	Topics 1, 2, 7, and 8
Notes and limitations	The information shows how well New Zealand students are doing against other countries, as well as showing how performance has changed over time. Cohorts can be studied over two periods, at year 5 and year 9 of their schooling. New Zealand participated in TIMSS 2006/07 at the year 5 level only.

Progress in International Reading Literacy Study (PIRLS)

Lead agency	Ministry of Education (under auspices of the International Education Authority (IEA) and led internationally by Boston College's Lynch School of Education, International Study Centre)
Collection type	International comparative study
Frequency	Every five years (since 2001)
Unit of measurement	Year 5 students
Coverage	Sample of New Zealand schools and a random sample of a group of students from each sampled school
Size	6,256 students in 2005/06
Fieldwork	Data is collected by the MoE Research Division, with tests administered by staff at each school
Key variables	Student Achievement in Reading Literacy, students' beliefs toward the subjects, attitudes, curricular intentions, school and classroom environments, family and home contexts
Relationship to information needs	Topics 1, 2, 7, and 8
Notes and limitations	The information shows how well New Zealand students are doing against other countries, as well as showing how literacy has changed over time. For nine countries including New Zealand, a sub-study administered at the same time as PIRLS (on a different sample of students) and known as the 10-year Trends Study, partially replicated the IEA Reading Literacy Study (1990).

Programme for International Student Achievement (PISA)

Lead agency	Ministry of Education (under the auspices of the OECD)
Collection type	International comparative study
Frequency	Every three years (since 2000)
Unit of measurement	School students aged between 15 years and 3 months and 16 years and 2 months
Coverage	In 2006, 57 countries (30 OECD Member countries) participated.
Size	In 2006, 265,000 students worldwide; 3,667 students from New Zealand
Fieldwork	Data is collected by the MoE Research Division.
Key variables	Gender, ethnicity, interest, attitudes, engagement, motivation, learning strategies, family background (socio-economic measures, language), school environment; reading, mathematical, and scientific literacy

Relationship to information needs	Topics 1, 2, 7, and 8
Notes and limitations	The sample does not include correspondence schools, schools catering for students with high special needs, or home-schooled children. Within schools the study does not include students who were permanently physically disabled in such a way that they could not perform the test. Also students who school staff considered to be educable mentally retarded or have been tested as such. Students with limited proficiency in English were also excluded. Total exclusions met international criteria (<5%).

National Education Monitoring Project (NEMP)

Lead agency	Educational Assessment Research Unit at the University of Otago (on behalf of the Ministry of Education)
Collection type	Survey (since 1995)
Frequency	Annual, on four-yearly cycles of learning areas across national curriculum and skills
Unit of measurement	Focuses on students at two levels of education: year 4 (aged 8–9 years) and year 8 (aged 12–13 years)
Coverage	All New Zealand
Size	3,000 students from 260 schools
Fieldwork	The surveying takes place in the second half of the school year, between August and November
Key variables	Sex, ethnicity, and geographical zone, assessment result in subject areas across the curriculum, interest and attitude towards subject areas, size of community, socio-economic index for the school, size of school, type of school
Relationship to information needs	Topics 1 and 7
Notes and limitations	This information is used for national monitoring of competency in subject areas across the curriculum and over time.

Tertiary education providers data – Single data return

Lead agency	Ministry of Education – sector returns
Collection type	Census
Frequency	Annual
Unit of measurement	Polytechnics, colleges of education, universities, wānanga, and private tertiary education providers
Coverage	All New Zealand
Size	
Fieldwork	Data is collected by the Education Information and Analysis

	Group. Data is collected from tertiary education providers, that receive MoE tuition subsidies or have courses approved for student loans or allowances, three times a year (as at 30 April, 31 August, and 31 December).
Key variables	Students enrolled in formal qualifications: *All Students*: Age, gender, ethnicity, disability, attendance status (full/part-time, internal, external, extramural) EFTS use, year of study (teacher trainees only), first year at the tertiary institution, source of funding, and residency status. *First year students*: Highest secondary qualification and year attained, main activity prior to enrolment, last secondary school attended, and year last attended. *International students*: By country of citizenship and form of assistance. Qualification enrolments: By programme of study, level of qualification, field of study and sub-field, qualification award category, first and last day enrolled in qualification, date of expected completion of qualification. Qualification and course completions: Most variables listed above are available Tertiary Staff: Academic and support staff, full and part-time numbers and FTTE, gender, designation (eg professor, lecturer) Community education: (provided by tertiary institutions): Age, gender, and subject taught.
Relationship to information needs	Topics 4, 5, and 10.
Notes and limitations	This information covers tertiary students who are entitled to student loans and allowances, training opportunities, and youth training participants working towards a recognised qualification. It is unit record data, using the national student number (NSI) as identification.

Adult Literacy and Life Skills (ALL) Survey and International Adult Literacy Survey (IALS)

Lead agency	Ministry of Education, NZ (under auspices of OECD)
Collection type	International comparative study
Frequency	Ten yearly (not repeating)
Unit of measurement	New Zealand adults aged 16–65
Coverage	Total New Zealand (excluding offshore islands, onshore islands, waterways, and inlets)
Size	About 7,000 people in 2006, about 4,000 people in 1996
Fieldwork	Data was collected by the MoE Research Division through

	face-to-face interviews. Conducted in 1996 and 2006 in New Zealand consisting of a background questionnaire, and literacy (prose, document, and quantitative) tests.
Key variables	Literacy, numeracy, problem solving, contextual information about education (qualifications), linguistic (language of the home), parental (qualifications), labour force (status, occupation), adult education and training (type of programme), and household (income), as well as demographic (gender, age)
Relationship to information needs	Topics 1, 2, 3, 4, 5, 6, 7, 8, 12, and 13
Notes and limitations	The strength of the ALL survey is that it dealt with levels of literacy right across the range, not just at the lower end. There was also a very comprehensive background questionnaire, with inter-generational information about the respondent's parents The ALL survey has been replaced by the OECD's Programme for the International Assessment of Adult Competencies (PIAAC). New Zealand is not participating in the first wave, which begins in 2011

National Survey of Secondary Schools

Lead agency	New Zealand Council for Educational Research (funded by Ministry of Education)
Collection type	Survey
Frequency	Three-yearly
Unit of measurement	Principals, teachers, parents, school trustees
Coverage	All New Zealand state and state-integrated secondary schools
Size	Census of principals and board of trustee chairs, sample of teachers, parents, school trustees
Fieldwork	Self completion questionnaire
Key variables	School size, decile, opinions on student motivation and engagement
Relationship to information needs	Topic 7
Notes and limitations	Survey questions and themes vary across years

New Zealand Qualifications Authority

Record of achievement

Lead agency	New Zealand Qualifications Authority
Collection type	Administrative data
Frequency	Continuous
Unit of measurement	Learners undertaking unit and achievement standards and qualifications registered on the National Qualifications Framework (NQF)
Coverage	All New Zealand
Size	Approximately three million learners (as at October 2009)
Fieldwork	When a learner undertakes a unit or achievement standard or qualification that is registered on the NQF details are provided to the NZQA, if learner does not have an existing National Student Number (NSN) then one is issued.
Key variables	Date of birth, gender, and ethnicity; names/s and levels of qualifications awarded including any endorsements; names, level, credit values and results for unit and achievement standards and the subject areas these standards sit whin.
Relationship to information needs	Topics 1 and 4
Notes and limitations	This database contains cumulative achievement data for all learners undertaking unit or achievement standards or being awarded qualifications registered on the NQF including New Zealand's national senior secondary qualification – NCEA. The data is submitted by secondary schools, polytechnics, wānanga and private training establishments (and very occasionally, universities). As of 1 July 2010, the NQF will be changed to the New Zealand Qualification Framework (NZQF) which will also include the Register of Quality Assured Qualifications.

NCEA statistics

Lead agency	New Zealand Qualifications Authority
Collection type	Administrative data
Frequency	Continuous
Unit of measurement	Learners undertaking achievement or unit standards contributing to NCEAs at levels 1, 2, and 3, and University Entrance (UE)
Coverage	All New Zealand
Size	Learners who have undertaken achievement or unit standards to contribute to NCEAs at levels 1, 2, and 3, and University Entrance (UE)

Fieldwork	When learners undertake achievement or unit standards to contribute to NCEAs their results are reported to NZQA
Key variables	Date of birth, gender, ethnicity, and school information; NCEAs, UE, and any other national qualification/s awarded including any endorsements of NCEAs; the names, levels, credit values, and results for contributing achievement and unit standards and the subject areas these standards sit within
Relationship to information needs	Topics 1, 2, and 4
Notes and limitations	Information on schools, learners, subjects, standards and qualification completion data is able to be interrogated through the publicly available statistics application on NZQA's website. There is a separate database that gives the outcomes of the older style senior school examinations (ie School Certificate, University Entrance, Sixth Form Certificate, University Bursary, Higher School Certificate) that occurred before the introduction of NCEA in 2002. The past five years' data is publicly available while the remainder can be obtained through NZQA.

Education Review Office

School and ECE provider reviews

Lead agency	Education Review Office
Collection type	School reviews
Frequency	Every three years on average
Unit of measurement	Schools and early childhood education providers
Coverage	All of New Zealand
Size	
Fieldwork	Review officers visit the schools and file a publicly available report.
Key variables	Practices, curriculum, children's language, areas of good performance, areas for further development, overall rating
Relationship to information needs	Topic 11
Notes and limitations	Reviews are undertaken more frequently where the performance of a school or centre is poor and there are risks to the education and safety of the students. Education reviews focus on school improvement, and ERO reports are designed to make it easier for schools to see what they are doing well, where they need to improve, and what they should do next.

Tertiary Education Commission

Tertiary Education Commission administrative data

Lead agency	Tertiary Education Commission
Collection type	Administrative data
Frequency	Continuous (since 1993)
Unit of measurement	Young people aged 16–24 years
Coverage	All New Zealand
Size	2,500 post-compulsory school training programmes offered by 500 providers nationwide. 220,000 people participated between the years 1993 and 2000 (plus Modern Apprenticeships and Industry Training schemes)
Fieldwork	
Key variables	Age, sex, ethnicity, school qualifications, field of training, measures of outcomes (ie number progressing to further tertiary training, employment, unemployment).
Relationship to information needs	Topic 4, 5, and 10
Notes and limitations	Data also includes information on *Training opportunities*: aimed at clients of the Department of Work and Income who are 18 years or older and who have a history of unemployment and low qualifications. *Youth training*: aimed at school leavers under 18 years of age, with low qualifications *Skill enhancement*: vocational training for young Māori and Pacific peoples.

Performance-Based Research Fund (PBRF) data

Lead agency	Tertiary Education Commission
Collection type	Administrative data
Frequency	Two dimensions are collected annually. The third is collected every six years
Unit of measurement	For two dimensions: tertiary education organisations. The third is eligible academic staff in tertiary education organisations
Coverage	Tertiary education organisations that maintain a research programme.
Size	31 tertiary education organisations
Fieldwork	Data is supplied by tertiary education organisations and their eligible staff to the Tertiary Education Commission
Key variables	Number of research degree completions each year; amount of external research income earned each year; listings of each staff member's research outputs, and the assessment of them

	by a peer assessment panel
Relationship to information needs	Topics 1, 2, 3, and 14
Notes and limitations	The information is used to determine the amount of research funding each participating tertiary education organisation will receive. The data shows how well each participating tertiary education organisation is performing against its research and knowledge creation objectives.

Community education provided by schools

Lead agency	Tertiary Education Commission
Collection type	Administrative data on enrolments in community education courses
Frequency	Annual
Unit of measurement	Student enrolments
Coverage	All New Zealand
Size	
Fieldwork	
Key variables	Students' sex and age group, ethnic group and school, subject of course
Relationship to information needs	Topics 5, 9, and 10
Notes and limitations	This collection provides information on the number of enrolments in adult and community education courses funded through schools. These courses cover: • Basic literacy and numeracy, English for speakers of other languages, te reo Māori and other languages • Secondary school subjects • Fitness, recreation, art, music, and crafts • Home management and maintenance • Parent education • Business, office, and work skills • Training of community volunteers.

Statistics New Zealand

Census of Population and Dwellings (Census)

Lead agency	Statistics NZ
Collection type	Census of population and dwellings
Frequency	Five-yearly
Unit of measurement	Every person and dwelling
Coverage	All New Zealand
Size	4.03 million people in 2006. The 2006 post enumeration survey shows that 98.0 percent of New Zealand residents in the country on census night were enumerated in the 2006 Census
Fieldwork	Date determined for each census; usually held in March in years ending 1 and 6
Key variables	Sex, age, ethnic group, highest school qualification, highest post-school qualification and subject, occupation, industry, income, location, current study participation
Relationship to information needs	Topics 1, 2, 3, 4, 12, 13, and 14
Notes and limitations	As a census, it is able to provide information on small sub-groups of the population. However, self-completion means there are quality issues. In addition, question changes limit comparability across time.

Household Labour Force Survey (HLFS)

Lead agency	Statistics NZ
Collection type	Household survey
Frequency	Quarterly (since 1985)
Unit of measurement	Individuals aged 15 years and over, households, families
Coverage	All New Zealand, excluding minor islands
Size	Around 15,000 households and 30,000 individuals (approximately 90 percent response rate)
Fieldwork	Continuous. Households remain in sample for eight quarters, with one-eighth of sample changing each quarter
Key variables	Age group, gender, ethnicity, region, labour force status, employment status, occupation, industry, highest school qualification, qualifications post-school qualification, participation in study toward a qualification in past week
Relationship to information needs	Topics 1, 2, 3, 4, 12, and 13
Notes and limitations	The Household Labour Force Survey (HLFS) produces New Zealand's official measures of employment and

	unemployment. It is designed to measure the number of New Zealanders in paid work, in unemployment, and not in the labour force. The figures are up-to-date, being produced on a quarterly basis and enabling changes over time to be monitored. Some regional analysis is possible from the HLFS. The HLFS is often used as the base for many of the ad hoc surveys that Statistics NZ produces.

New Zealand Income Survey (NZIS)

Lead agency	Statistics NZ
Collection type	Household survey
Frequency	Annual (since 1997)
Unit of measurement	Individuals aged 15 years and over, households, families
Coverage	All New Zealand, excluding minor islands
Size	15,000 households
Fieldwork	June quarter of HLFS (April to June)
Key variables	Age, sex, ethnicity, highest educational qualification, labour force status, actual and usual gross wages and salary, hours worked, government transfer income, and income from investments (from 2002)
Relationship to information needs	Informs topics 1, 2, 3, 4, 12, and 13
Notes and limitations	The New Zealand Income Survey (NZIS) is conducted annually as a supplement to the Household Labour Force Survey during the June quarter. The survey collects actual and usual gross income from wages and salaries (divided into ordinary time, overtime, and other job-related income) for the main job and up to two other jobs. To match this, information on actual and usual hours worked is collected. The information on wages and salaries relates to the respondents' most recent pay period. Due to its large sample size, the NZIS is a useful source of data for regional and sub-group analysis.

New Zealand Childcare Survey

Lead agency	Statistics NZ (on behalf of the Department of Labour and the National Advisory Council on the Employment of Women)
Collection type	Supplement in the Household Labour Force Survey
Frequency	Twice: 1998 and 2009
Unit of measurement	People aged 15 years and over
Coverage	All New Zealand
Size	3,089 households in 1998; 3,656 households in 2009
Fieldwork	July–September 1998; July–October 2009
Key variables	Sex, age, ethnic group, highest educational qualification,

	labour force status, early childhood education (ECE) and care, coping with disruptions to ECE and care arrangements, satisfaction with ECE and care arrangements, whether ECE problems are a barrier to work and education, work arrangements
Relationship to information needs	Informs topics 1, 2, 3, 4, 5, 6, 11, 12, and 13
Notes and limitations	The survey was designed to gather information from parents on the use of ECE and care for children under 14 years of age and on the relationship between labour force participation and the use of ECE and care. It consisted of two questionnaires: one about children (one for each child) and one about parents. Interviewing was stopped for two weeks during the quarter when there were school holidays. All the data can be linked to the HLFS questions.

Education and Training Survey (ETS)

Lead agency	Statistics NZ (with input from the Ministry of Education and The Treasury)
Collection type	Supplement in the September quarter of the Household Labour Force Survey, 1996
Frequency	Once
Unit of measurement	People aged 15 years and over
Coverage	All New Zealand
Size	22,500 (individuals, not households, were the sampling unit; 85.1 percent response rate)
Fieldwork	July–September 1996
Key variables	Sex, age, ethnic group, school study (for those still at school). For formal qualifications gained or studied for in last 12 months, work-provided training courses in the last 12 months, and other courses undertaken in the last 12 months to improve job skills, information is collected on: • type of institution • full-time/part-time status • whether employed at same time • what assistance employer provided • how training paid for • barriers • reasons for doing the training. Training desired, reason not participated, subject of course; training started but not finished, why, subject of course, who ran the course; training expected, why Existing qualifications, institution, year of conferment, reason

	for studying
	Number of years at secondary school, number of years of full-time study since leaving school, length of time with current employer, pay from current main job
Relationship to information needs	Informs topics 1, 2, 3, 4, 5, 6, 7, 12, and 13
	The Education and Training Survey provides information on employment-based training. It is a rare source of information on skills acquired outside the formal qualification system
Notes and limitations	The survey was one-off and its age is making the data minimally useful.

Survey of Working Life

Lead agency	Statistics NZ
Collection type	Household survey, supplement to the HLFS in March 2008 quarter
Frequency	One-off (with intentions to repeat)
Unit of measurement	Individuals aged 15 years and over, households, families
Coverage	All New Zealand, excluding minor islands
Size	14,510 individuals
Fieldwork	January–March 2008
Key variables	Age, sex, gender, job tenure, quality of working life, job satisfaction, highest qualification, wage/salary, participation in education and training in past 12 months, duration of education and training
Relationship to information needs	Topics 1, 2, 3, 4, 5, 10, 12, and 13
Notes and limitations	Respondents are asked if they participated in employer-funded training in past twelve months. If yes, they are asked to indicate cumulative duration using categories for length of time (ranging from one day or less to six months or more). While type of learning may be inferred from duration, this is difficult to do reliably.

Survey of Family, Income and Employment Dynamics (SoFIE)

Lead agency	Statistics NZ
Collection type	Longitudinal survey
Frequency	Annual interviews for eight years
Unit of measurement	People aged 15 years and over, household
Coverage	All New Zealand
Size	11,500 households selected in wave 1
Fieldwork	Annual survey 2002–2010.

Key variables	Sex, age, ethnic group, education, parents' education, self-assessed health status, net worth and savings, standard of living, labour market activity, employment spells, annual income, employee earning spells, government income
Relationship to information needs	Topic 1, 4, 8, 10, and 12
Notes and limitations	From the second interview, people who begin living with an original sample member (OSM) will also be interviewed, but only while they remain living with an OSM

Longitudinal Immigration Survey: New Zealand (LisNZ)

Lead agency	Statistics NZ
Collection type	Longitudinal survey
Frequency	One-off
Unit of measurement	Migrants aged 16 years and over who were approved for permanent residence in New Zealand from 1 November 2004 to 31 October 2005
Coverage	All New Zealand
Size	5,000 individuals in the first wave
Fieldwork	Respondents interviewed at 6, 18, and 36 months after taking up permanent residence.
Key variables	Age, sex, ethnicity, nationality, school and post-school qualifications held, participation in study towards formal qualifications, qualifications attained to improve job prospects, English language training and barriers to English language training, qualifications assessment, occupational registration and skill levels based on the Australian and New Zealand Standard Classification of Occupations (ANZSCO '06).
Relationship to information needs	Topics 1, 4, 6, and 10
Notes and limitations	The Longitudinal Immigration Survey: New Zealand (LisNZ) traces the pathways of recent migrants to New Zealand. The LisNZ gives detailed and ongoing information on social and economic aspects of migrants' settlement outcomes during their first three years of permanent residence in New Zealand

General Social Survey (GSS)

Lead agency	Statistics NZ
Collection type	Household survey
Frequency	Two-yearly (since 2008/09)
Unit of measurement	Individuals aged 15 years and over living in private household
Coverage	All New Zealand, excluding minor islands
Size	8,000

Fieldwork	April 2008 to March 2009, computer-assisted personal interviews
Key variables	Age, sex, ethnicity, highest educational qualification, labour force status, family and household composition, housing tenure, household income, personal income, sources of income, experience of material deprivation
Relationship to information needs	Informs topics 1, 4, 7, 8, and 12
Notes and limitations	The General Social Survey (GSS) is a new survey that collects information across the 12 social domains that make up the Programme of Official Social Statistics (POSS). An important objective of the survey is to enable cross-domain analysis of social outcomes and the factors associated with them. The GSS collects information about the respondent's satisfaction with their existing knowledge and skills, current training activity, barriers to further training and perception of the importance of education. The core modules collect information on highest completed secondary school, and highest completed qualification. The multi domain aspect of GSS means knowledge and skills data can be linked with other life outcomes and perspectives.

Household Economic Survey (HES)

Lead agency	Statistics NZ
Collection type	Household Survey
Frequency	Annual 1973–1998. Since 2001 the survey has been conducted triennially
Unit of measurement	People aged 15 years and over
Coverage	All New Zealand, excluding minor islands
Size	3,000 households with 3,500 in some years when Consumers Price Index (CPI) being updated
Fieldwork	1 July–30 June from 1973–1974, April–March from 1975–1998, July–June from 2000/01, June–July 2003/04, June–July 2006/07
Key variables	Sex, age, ethnic group, highest educational qualification, expenditure on a range of items and services, household composition, labour force status, household and personal income, living standards
Relationship to information needs	Informs topics 1, 4, and 12
Notes and limitations	Information from this survey was primarily used for deciding the basket of goods and services to be priced in the CPI. It started with a simple one-page income questionnaire, which has developed over the years into the most detailed

	questionnaire used in New Zealand. The small sample size makes it difficult to use this survey to obtain information about population sub-groups. The shift to a three-yearly cycle also reduces the usefulness of the survey for monitoring and evaluation purposes.

Time Use Survey (TUS)

Lead agency	Statistics NZ (on behalf of the Ministry of Women's Affairs)
Collection type	Sample survey of households
Frequency	Approximately 10-yearly
Unit of measurement	Individuals aged 12 years and over
Coverage	All New Zealand, excluding minor islands
Size	8,500 individuals
Fieldwork	Questionnaire and 48-hour diary, July 1998–June 1999, and Sept 2009–August 2010
Key variables	Sex, age, ethnic group, urban/rural, labour force status, government transfer status, family type, income, and time spent on paid and unpaid work
Relationship to information needs	Informs topics 1, 2, 4, and 5
Notes and limitations	The first wave of results from the 2009/10 survey will be available in mid-2011.

Household Savings Survey (HSS)

Lead agency	Statistics NZ (on behalf of the Retirement Commission)
Collection type	Household survey
Frequency	One-off (with intention to conduct 8–10-yearly)
Unit of measurement	People aged 18 years and over, one person per household. If their partner was living in the same household they were interviewed as a couple
Coverage	All New Zealand, excluding minor islands
Size	5,374 interviews including a Māori booster sample
Fieldwork	August to November 2001
Key variables	Net worth, value and type of assets, value and type of debt, sex, age, ethnic group, highest educational qualification, labour force status, income from wages and self employment
Relationship to information needs	Informs topics 1 and 12
Notes and limitations	A second HSS was planned as part of POSS for 2011, but budget constraints mean the survey is not going ahead at this time.

Cultural Experiences Survey 2002

Lead agency	Statistics NZ (on behalf of the Ministry for Culture and Heritage)
Collection type	Household survey (supplement to the Household Labour Force Survey)
Frequency	One-off
Unit of measurement	People aged 15 years and over
Coverage	All New Zealand, excluding minor islands
Size	13,475 individuals
Fieldwork	January–March 2002
Key variables	Sex, age, ethnic group, highest educational qualification, labour force status, income, location, participation in specific Māori cultural activities: mātauranga Māori (learning about traditional Māori customs, practices, history or beliefs); visiting a marae; visiting wāhi taonga (sites of historical importance to Māori); and viewing exhibitions of taonga (displays of Māori ancestral treasures).
Relationship to information needs	Informs topic 9
Notes and limitations	

Survey of Older People in 2000

Lead agency	Statistics NZ (commissioned by the Super 2000 Taskforce)
Collection type	Household survey (supplement to the HLFS in the March 2000 quarter)
Frequency	One-off
Unit of measurement	Usually resident, non-institutionalised population aged 65 years and over
Coverage	All New Zealand, excluding minor islands
Size	3,000 people aged 65 plus, with companion survey of 500 Māori persons aged between 65 and 69 years
Fieldwork	January–March 2000
Key variables	Highest qualification (information linked to HLFS to obtain this), health and disabilities; mood, mobility, family and social networks, financial support, family support, unpaid work, home production, accommodation, general insurance, superannuation, government allowances, overseas pensions, private superannuation or job-related pension schemes, regular paid employment and self employment, other sources of income, total income, assets, life history, recent financial stress, socio-economic status, self rating standard of living, whether respondents owned a range of items and participated in a series of activities, and their ranking of the

	importance of these
Relationship to information needs	Informs topics 1 and 12
Notes and limitations	Long term residents of homes for older persons, retirement homes, hospitals, and psychiatric institutions were excluded from the sample.

Māori Social Survey (MSS) – in development

Lead agency	Statistics NZ
Collection type	Post census household survey
Frequency	One-off (2011)
Unit of measurement	People of Māori ethnicity or descent, aged 15 years and older, living in private households
Coverage	All New Zealand, excluding minor islands
Size	5,000
Fieldwork	Face-to-face computer assisted personal interviews, bilingual collection
Key variables	Sex, age, Māori descent and ethnicity, family type, region, social marital status, personal income, tenure of household, household composition, labour force status, health, social connectedness, experienced discrimination and crime victimisation; highest qualification, current participation in education; engagement in Māori culture including: participation in Māori specific education; Māori language proficiency and use; non-formal learning about Māori culture; use of Māori broadcast media; marae attendance; perception of whānau well-being; perceived importance of being involved in Māori culture
Relationship to information needs	Will inform topics: 1, 6, 7, and 9
Notes and limitations	The Māori Social Survey incorporates elements of the discontinued Māori Language Survey.

Household Disability Survey

Lead agency	Statistics NZ
Collection type	Post census household survey
Frequency	Every five years (since 1996)
Unit of measurement	Usually resident population staying in private dwellings or group homes on the night of the census
Coverage	All New Zealand, excluding minor islands. The sample frame was aided by the two general disability questions asked in the census
Size	20,000 people

Fieldwork	Telephone interviews, proxy responses permitted. Child questionnaire for respondents aged up to 14 years; adult questionnaire for respondents aged 15 and over.
Key variables	Type of disability, multiple disabilities, cause of disability, duration, use of special equipment, severity of limitation, government assistance, job search methods, reason for not being in the labour force, work status (full-time/part-time), unmet need for special equipment, difficulties experienced travelling, help with everyday activities Census variables: age, sex, ethnicity, highest educational qualification, marital status, total personal income, total household income, occupation, family type, labour force status, usual household composition, source of personal income, means of travel to work
Relationship to information needs	Informs topics 1, 4, 6, and 12
Notes and limitations	The survey has undergone significant redevelopment for the 2011 iteration.

Integrated Data on Student Loans and Allowances (SLA) dataset

Lead agency	Statistics NZ
Collection type	Integrated administrative dataset
Frequency	Annual updates of the integrated dataset. Due to the nature and sources of data, some variables are not available in the earlier years.
Unit of measurement	Every person who borrows under the Student Loans Scheme and/or receives a student allowance
Coverage	All New Zealand
Size	476,376 enrolments in 2008, including 178,506 loan and/or allowance recipients
Fieldwork	Dataset that links enrolment and completion education data from the Ministry of Education with borrowing and allowance information from the Ministry of Social Development (StudyLink), and income and repayment information from Inland Revenue
Key variables	Sex, age, ethnic group, type of tertiary institution at which enrolled, programme in which enrolled, qualification(s) in which enrolled, loan draw downs/borrowing, loan balance, repayment details, non-resident borrowers, income, income source (employer and income details will be monitored beyond the time that a person is a student), allowance received in a year, completion status, region
Relationship to information needs	Informs topics 4 and 12

Notes and limitations	Information from the integrated dataset can be used to monitor the level of student loan borrowing and the speed with which the loan balance is being repaid. Longitudinal information on income levels of people with tertiary qualifications will also be of interest. The inclusion of statistics on non-resident borrowers will inform on the number of former borrowers living overseas as well as provide details of their loans, repayments and educational and demographic characteristics.

Employment Outcomes of Tertiary Education (EOTE) dataset

Lead agency	Statistics NZ
Collection type	Integrated dataset of administrative data
Frequency	Annual
Unit of measurement	Every student enrolled with a tertiary education provider and every person participating in industry training
Coverage	All New Zealand
Size	
Fieldwork	Integrated dataset that links tertiary education and industry training data to the Linked Employer-Employee Dataset (LEED).
Key variables	Sex, age, ethnic group, type of tertiary institution at which enrolled, programme in which enrolled, qualification(s) in which enrolled, completion status, earned income, main source of income, industry of employer, main firm size, programme category, programme level, highest qualification, industry training organisation
Relationship to information needs	Informs topics 4, 10, and 12
Notes and limitations	Dataset has no outputs in production, but available for research. Provider-based statistics are available for students enrolled from 2003. For workplace-based learners statistics are available from 2000.

Business Operations Survey

Lead agency	Statistics NZ
Collection type	Business survey
Frequency	Annual
Unit of measurement	Economically significant businesses
Coverage	All New Zealand
Size	7,000 businesses
Fieldwork	Postal survey
Key variables	Whether research and development (R&D) activity was

	undertaken, amount spent on R&D; Staff participation in training
Relationship to information needs	Informs topics 5 and 14
Notes and limitations	The former innovation survey has been incorporated into this survey.

Research and Development Survey

Lead agency	Statistics NZ (sponsored by Ministry of Research, Science and Technology)
Collection type	Business survey
Frequency	Two-yearly (since 1992)
Unit of measurement	Economically significant enterprises that carry out or fund R&D in New Zealand
Coverage	All New Zealand
Size	Over 3,500 businesses, universities and government organisations
Fieldwork	Postal questionnaire
Key variables	Organisation type, sources and value of R&D income, R&D expenditure
Relationship to information needs	Informs topic 14
Notes and limitations	There are four versions of the questionnaire: a business form, a government form, a crown research institute form, and a higher education form.

Social Indicators Survey

Lead agency	Statistics NZ
Collection type	Household survey
Frequency	One-off (1981)
Unit of measurement	People aged 15 years and over
Coverage	All New Zealand
Size	6,891 individuals. One person per private household interviewed (half of sample was the HES sample that year, and another 3,500 households were specially selected).
Fieldwork	October 1980–September 1981
Key variables	Sex, age, ethnic group, educational information, labour force status, income, health, housing and neighbourhood, personal safety and justice , leisure, social participation, family and social attachments
Relationship to information needs	Informs topics 1, 4, 5, 7, 8, and 11

Notes and limitations	The survey collected some education information, using the questions from the HES (people who were in the HES and the Social Indicators Survey were not asked the same questions twice, so data was taken from the HES records in that case). There were a number of general questions in addition to those in the education section.

Te Puni Kōkiri

Survey on the Health of the Māori Language (2001)

Lead agency	Statistics NZ (on behalf of Te Puni Kōkiri)
Collection type	Post-census household survey
Frequency	One-off
Unit of measurement	People of Māori ethnicity or descent 15 years of age and older living in private households
Coverage	All New Zealand
Size	5,000
Fieldwork	Data collection was undertaken May–June 2001
Key variables	Age, sex, languages spoken, how the respondent learnt to speak Māori, speaking proficiency, listening proficiency, use of Māori in the home, current use of Māori language outside the home, listening to Māori radio, watching Māori TV, reading proficiency, reading material, writing proficiency, writing material, learning Māori; revitalisation, region, religion, highest qualification, labour force status, industry, occupation, iwi, income, family type, and household composition
Relationship to information needs	Informs topics 4, 5, 6, 7, 9, and 12.
Notes and limitations	This survey was designed to describe the status of the Māori language by examining Māori language proficiency and Māori language behaviours and experiences. The survey also investigated the availability of Māori language materials and resources. Survey repeated in 2006 for Te Puni Kōkiri by Research New Zealand.

Survey on the Health of the Māori Language (2006)

Lead agency	Te Puni Kōkiri (conducted by Research New Zealand)
Collection type	Post census household survey
Frequency	One-off
Unit of measurement	People of Māori ethnicity or descent 15 years of age and older living in private households
Coverage	New Zealand districts with more than 2,350 Māori resident (leaving 40 districts)

Size	3,858 individuals
Fieldwork	
Key variables	Age, sex, languages spoken, how did the respondent learn to speak Māori, speaking proficiency, listening proficiency, use of Māori in the home, current use of Māori language outside the home, listening to Māori radio, watching Māori TV, reading proficiency, reading material, writing proficiency, writing material, learning Māori, revitalisation, areas, religion, highest qualification, labour force status, industry, occupation, iwi, income, family type and household composition, satisfaction with overall proficiency, role in choosing children's education.
Relationship to information needs	Informs topics 4, 5, 6, 7, 9, and 12
Notes and limitations	This survey was designed to describe the status of the Māori language by examining Māori language proficiency and Māori language behaviours and experiences. The survey also investigated the availability of Māori language materials and resources.

Ministry of Social Development

Benefit data

Lead agency	Ministry of Social Development
Collection type	Administrative data (includes receipt of Unemployment Benefit – Training)
Frequency	Captures all change events from mid-1996. Selected statistics are summarised quarterly
Unit of measurement	Individuals receiving income support
Coverage	All New Zealand
Size	Official counts show a total of 310,296 working age main beneficiaries at the end of June 2009, and a further 541,774 people receiving New Zealand Superannuation and Veterans' Pensions
Fieldwork	Continuous
Key variables	Sex, age, ethnic group, educational attainment, type of benefit or subsidy, start and end dates (giving duration on benefit), amount paid, Work and Income region, presence of spouse and or children.
Relationship to information needs	Informs topic 12
Notes and limitations	This information provides a stocktake of those on a benefit. The benefit of interest to this domain is Unemployment Benefit - Training. Eligibility for this assistance is generally restricted to people aged 18–64 years. At the end of June

	2009 there were 7,356 working age recipients of Unemployment Benefit – Training. Work and Income clients may also access the Training Incentive Allowance (12,712 in the 2008 calendar year) and other forms of supplementary assistance to assist with costs of training.

Benefit Dynamics Data

Lead agency	Ministry of Social Development
Collection type	Administrative data (includes receipt of Unemployment Benefit – Training)
Frequency	Captures all spells on main benefits from 1993
Unit of measurement	Individuals receiving main benefits
Coverage	All New Zealand
Size	Official counts show a total of 310,296 working age main beneficiaries at the end of June 2009, and a further 541,774 people receiving New Zealand Superannuation and Veterans' Pensions
Fieldwork	Continuous
Key variables	Sex, age, ethnic group, educational attainment, type of main benefit, start and end dates (giving duration on benefit), Work and Income region, presence of spouse and or children
Relationship to information needs	Informs topic 12
Notes and limitations	

Work and Income training courses

Lead agency	Ministry of Social Development
Collection type	Administrative data. Work and Income facilitates three categories of course groups: • *Development Services* eg careers guidance, job search skills, motivational training (this includes Limited Service Volunteers, Outward Bound etc), Conservation Corps, and lifeskills seminars • *Upskilling* eg industry partnerships, targeted skills training, and the Training Opportunities Programme run in conjunction with the Tertiary Education Commission • *Work Experience* that provides learning opportunities with a structured work based environment.
Frequency	Captures all change events. Selected statistics are summarised quarterly
Unit of measurement	Start events for individuals successfully referred to Work and Income courses

Coverage	All New Zealand
Size	54,000 start events were recorded for the above course groups within the fiscal year 2008/2009
Fieldwork	Continuous
Key variables	Age, sex, ethnicity, education level, field of training, administrative service centre, nature of disadvantage in the labour market, sole parent status, and placement to paid employment as a training outcome Note that additional data, for example the occupation and industry type of some training programmes, may be appended from other sources within the Ministry
Relationship to information needs	Informs topics 5 and 12
Notes and limitations	Note that some trainees may have started on more than one course. This data provides information on employment training, and is of particular interest in tracking the transition from benefit to employment for specific client groups.

Other providers of knowledge and skills data

New Zealand Vice Chancellors' Committee (NZVCC) – University Graduate Destinations Survey

Lead agency	New Zealand Vice Chancellors' Committee
Collection type	Survey
Frequency	Annual
Unit of measurement	University graduates
Coverage	New Zealand university graduates
Size	Samples all students who became eligible to graduate from a New Zealand university in the prior year
Fieldwork	The Graduate Destination Survey is usually conducted in the second quarter of the year after the students have completed programmes
Key variables	Field of study, level of study, type of employment, sex, employer group (industry), age, salary, university
Relationship to information needs	Informs topic 12
Notes and limitations	Response rates to this survey are typically low. This survey programme has been discontinued.

University of Otago School of Medicine – Dunedin Multidisciplinary Health and Development Study

Lead agency	University of Otago School of Medicine
Collection type	Longitudinal study
Frequency	Babies followed up at ages 3, 5, 7, 9, 11, 13, 15, 18, 21, 26 and 32 years (to date)
Unit of measurement	Individuals born in Dunedin, New Zealand between 1 April 1972 and 31 March 1973 at the Queen Mary Maternity Hospital, and their families.
Coverage	Dunedin
Size	1,037 individuals and their families. At follow-up at the age of 26, the retention rate of living members was 96%.
Fieldwork	Half or full day assessments for interviews (participants travel to Dunedin for all assessment phases), test, and examinations of the children (parents were also included until the children reached the age of 13); hospital records; police records; blood samples.
Key variables	Whether studying, type of study, educational institute, field of study, details of training scheme, high school leaving age, reason for leaving school, highest school qualification, other qualifications, future plans, public examination results, a wide range of health indicators, pre-school attendance, attitudes to preschool and age of commencement, school behaviour and adjustment, absences from school, number of teachers, parents' association and contact with school, teacher comments on child.
Relationship to information needs	Informs topics 8, 9, 11, and 12
Notes and limitations	The primary purpose of this research was to study the nature and prevalence of some development and health problems, and factors associated with them. Future assessments are scheduled for members at the ages of 38, 44 and on into the future.

University of Otago School of Medicine – Christchurch Health and Development Study

Lead agency	University of Otago School of Medicine
Collection type	Longitudinal study
Frequency	This cohort has been studied at birth, four months, one year and annually to the age of 16 years, then at 18, 21, 25, and 30 years
Unit of measurement	Babies born at Christchurch maternity hospitals during the period 15 April–5 August 1977

Coverage	Christchurch
Size	1,265 individuals and their families. At follow-up at the age 21years, the retention rate of living members was 82%.
Fieldwork	Parental interviews (birth to 16 years); teacher questionnaires (6–13 years); child and young person interviews (8–21 years); hospital records (birth to 16 years); police records (at 14 and 21 years)
Key variables	Perinatal health, social background, child health, child behaviours, parenting, family transitions, family material wellbeing, family socioeconomic status, family income, family violence, family planning, step-parenthood, family size, family disadvantage, ethnicity, child educational achievement, adolescent physical and mental health, crime, pregnancy/parenthood, substance use, employment, childhood sexual abuse
Relationship to information needs	Informs topics 8, 9, 11, and 12
Notes and limitations	The primary purpose of this research was to study the health, education, and life progress of the cohort.

University of Otago School – Longitudinal study of university graduates

Lead agency	University of Otago: The National Centre for Lifecourse Research and the Centre for Research on Children and Families
Collection type	Longitudinal survey
Frequency	Information collected from graduates in their final year at university, and anticipated to follow up at 3, 6, and 10 years post graduation
Unit of measurement	Final year students graduating 2011
Coverage	All New Zealand universities
Size	4,000–5,000 final year
Fieldwork	Participants to fill out web-based assessment
Key variables	Educational institute, field of study, demographics, financial, post degree ambitions, job and salary expectations, skills and knowledge acquisition, study-employment transition, future plans, migration, international vs domestic students, undergraduate vs postgraduate differences, sex disparities
Relationship to information needs	Informs topics 2, 7, 10, 12, 13, and 14
Notes and limitations	In development. Will replace the NZVCC Graduate Destinations Survey

University of Otago Wellington School of Medicine – Census Mortality Study

Lead agency	Wellington Medical School and Statistics NZ
Collection type	Anonymous and probabilistic data matching between mortality records and census records (NZHIS)
Frequency	1981, 1986, 1991, 1996, and 2001 census records have been matched with the mortality records for three years after each census
Unit of measurement	People aged 25–64 years
Coverage	All New Zealand
Size	The percentages of eligible deaths of those aged 1–74 years successfully linked to a census record were 70.9%, 73.7%, 76.3%, 77.6% and 79.6% for the five census cohorts, respectively
Fieldwork	Date determined for each census; usually held in March in years ending 1 and 6
Key variables	Sex, age, ethnic group, country of birth, marital status, highest educational qualification, tertiary qualifications, highest school qualification, income (personal and household), smoking (1996 only), labour force status, occupation, industry, housing tenure, dwelling type, car access, household income, residence, living arrangements, New Zealand deprivation index, New Zealand socio-economic indicator, cause of death
Relationship to information needs	Informs topic 12
Notes and limitations	The aim of the original study was to measure the association of deprivation, education, occupational class, housing tenure, car access, and income with mortality among those aged 25–64 years during 1991–94 in New Zealand Of particular relevance to education are the associated links between education and car access with mortality. Mortality gradients by education tended to be strongest among those aged 25–44 years, for all causes of death Since then other censuses have been matched, allowing a cohort approach. This will allow the strength or the relationship of socio-economic factors with mortality across time. The four cohort studies traverse a 20-year period of major macroeconomic and social change in New Zealand. The 1996 question on smoking will be used to investigate the extent to which smoking acts as an intermediate variable in the relation between socio-economic factors and mortality. The data also makes it possible to investigate possible contextual effects for variables such as neighbourhood deprivation and income inequality.

Massey University – Best Outcomes for Māori/Te Hoe Nuku Roa

Lead agency	Massey University (Te Pūmanawa Hauora Research Centre for Māori Health and Development)
Collection type	Longitudinal study (since 1994)
Frequency	Interviews every three years
Unit of measurement	Households in which Māori people live (ie, people who self-identify as being descended from a Māori ancestor)
Coverage	Northland, Auckland, Gisborne, Manawatu, Hutt City, Nelson/Marlborough Sounds and Southland.
Size	600 households, 1,600 individuals.
Fieldwork	Hour-long personal interviews
Key variables	Language, cultural identity and participation, living standards, employment, income, and housing
Relationship to information needs	Informs topics 1, 4, 9, and 12
Notes and limitations	The primary purpose of this research is to obtain a longitudinal study of Māori households that will allow cultural, economic, and personal factors to be correlated.

Ministry of Health – New Zealand Health Survey

Lead agency	Ministry of Health
Collection type	Survey
Frequency	Three-yearly (since 1992/93)
Unit of measurement	Adults (aged 15+) and Children (aged 0–14 years, by proxy) living in private households
Coverage	All New Zealand
Size	12,488 adults and 4,922 children in 2006/07
Fieldwork	Computer-assisted personal interview, 1992/93, 1996/97, 2002/03, and 2006/07
Key variables	Sex, age, ethnic group, income, health status, health conditions, highest school and post-school qualifications, labour force status, NZDep score
Relationship to information needs	
Notes and limitations	Different questionnaires and methodology have been used each time.

Auckland University – Youth 2000

Lead agency	Auckland University Adolescent Health Researchers' Group
Collection type	Survey
Frequency	2001, 2007

Unit of measurement	Youth in years 9 to 13 attending secondary school
Coverage	All New Zealand
Size	Over 9,000 respondents
Fieldwork	Computer-assisted self interview
Key variables	Age, gender, ethnicity, household composition, attitudes towards school, expectations of caregivers and teachers, self-reported school performance, teacher relationship, te reo Māori language ability, Māori medium education, Māori cultural knowledge, satisfaction with Māori cultural knowledge.
Relationship to information needs	Informs topics 7 and 9
Notes and limitations	