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Technical report: Survey methodological options for a) non-completers of VET and b) apprentices and trainees over time

Stephen Lamb
Centre for Post-Compulsory Education and Lifelong Learning, University of Melbourne

A National Vocational Education and Training **Research** and **Evaluation** Program **Report**

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Stephen Lamb
Centre for Post-Compulsory Education and Lifelong Learning
University of Melbourne

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Key messages

Current destination surveys of vocational education and training (VET) students in Australia tend to focus on course and module completers.[1] There is no regular national follow-up of students who drop out of VET programs without recording any educational achievement. Furthermore, there is little follow-up information on apprentices and trainees and where they end up in the longer term.

- Finding out about students who drop out of VET with no recorded achievement would be useful in developing strategies to reduce this occurrence. Considering all the methodological options, the author suggests a two-pronged approach, whereby administrative data on student enrolments are analysed regularly to indicate the size and broad dimension of student non-completions. A survey of non-completers is also undertaken every three years to determine the reasons for, and behavioural factors leading to withdrawal and non-completion.
- A longitudinal survey of apprentices and trainees is also useful for providing data to help us to better understand the long-term impact of a contracted training approach on career paths and earnings. The author recommends the Canadian National Apprenticed Trades Survey as providing a good working model for such an approach. The survey should be based on a sample of completers and non-completers of apprenticeship and traineeship programs determined through administrative data analysis.

[1] Those who successfully complete all or part of a course and then leave the VET system.

Executive summary

This report investigates the design and development of appropriate methodologies for two separate surveys: firstly, a national survey of students in vocational education and training (VET) who leave without completing any courses; and secondly, a longitudinal survey of VET students who pursue the apprenticeships and traineeships pathway.

There is a need for more information on both completion data as a key performance measure in VET and the impact of training on career paths, income and labour market experiences. Current destination surveys of VET students tend to focus on course and module completers; there is no national follow-up of those students who drop out of VET programs. Similarly, there is no adequate longitudinal data on apprentices and trainees to assist in estimating the long-term impact of contracted training on career paths and earnings.

The investigation was undertaken in several stages. The first stage involved an extensive review of research and literature detailing similar surveys conducted in Australia and overseas. The second stage comprised a series of workshops and interviews with a range of key agencies (including the Australian National Training Authority [ANTA], the Department of Education, Science and Training, the Victorian Office of Training and Tertiary Education, and the Tasmanian Office for Post-Compulsory Education and Training) to canvass views on the options and issues raised from the review of methodologies. The work undertaken as part of the initial stages was used to help prepare this report outlining the strengths and weaknesses of alternative methodologies and provide options on ways of conducting the two surveys.

The report is organised in three sections. Following the introduction, methods for undertaking the survey of VET non-completers are investigated. This section provides a broad overview from the literature of methodologies adopted for similar projects within Australia and overseas, including countries such as Austria, Canada, Denmark, England, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Spain, and the United States. It also raises definitional issues that need to be addressed in the design, development and conduct of the survey. It concludes with options for establishing and conducting the survey, based in part on the advice and views of the experts interviewed in the consultation phase of the project.

The third section of the report looks at longitudinal surveys of apprentices and trainees. It presents information and raises issues that have emerged from a review of similar surveys undertaken in Australia and overseas. Options for establishing and conducting the survey are given in this section, again based in part on the advice and views of the experts interviewed in the consultation phase of the project, as well as on international work.

Survey of VET non-completers

There are several main aims in undertaking a survey of VET non-completers. One is to obtain information on the characteristics of the non-completers—their backgrounds, courses of study, and enrolment patterns. Another is to find out the reasons why these students do not complete

their study or training, in order to assess whether the rate can be reduced through targeted support and other measures. A further aim is to examine the outcomes of non-completers to assess the effects on individuals of withdrawal from VET. Some of this information does not have to be collected from individuals themselves, but can be obtained through an analysis of administrative provider data on students assembled as part of the national VET statistics collection, and examined in the context of the Australian Vocational Education and Training Management Information System Standard (AVETMISS).

In analysing administrative provider data on students to determine non-completion rates, it will be necessary to target the non-completers more comprehensively to gain some measure of students' intentions for study. While it is still possible for students to change their intentions over time, the inclusion of an intentions question on the student enrolment form would provide a reasonable foundation for assessment of non-completion.

Through the analyses of administrative provider data on students, withdrawal or non-completion can be measured. The National Centre for Vocational Education Research (NCVER) has developed a methodology to link a student's records across different years using a number of demographic and other variables. The method assigns a unique identification to each person and thus allows links to be made between an individual's enrolment records across years. The course code, which is unique to each course across all years, allows identification of whether a student is continuing in the same course or not. Using the matched records it is possible to analyse non-completion by tracing the enrolments and records of students over a defined period.

The analyses of administrative provider data on student withdrawal or non-completion need to be supplemented by a survey of non-completers every three years to collect information on the experiences, views and outcomes of students who are identified as non-completers in the previous year.

Administrative data can tell us very little about the reasons for non-completion and the outcomes of non-completers. This information requires surveys of the non-completers themselves, surveys which attempt to establish the reasons for non-completion, the experiences of non-completers, and their outcomes. Such surveys do not need to be undertaken as regularly as those used to derive estimates of rates of non-completion using administrative data. However, they are important because they can provide valuable information on some of the underlying behavioural factors leading to withdrawal and non-completion of VET study.

The definition of non-completion is difficult in VET. Not all students who enrol in a VET course intend to complete the full qualification. Some undertake their study with a view to completing only some elements or modules of a course rather than the full qualification. This means that there are various groups of VET participants who have different intentions, and the notion of non-completion will vary according to the group of participants. For this reason, one possibility in a survey of non-completion is to undertake analysis based on different definitions, one option being for the survey to be undertaken in conjunction with and using the same methodology as NCVER's Student Outcomes Survey, but augmented to include students who meet the following criteria:

- ✧ those who were enrolled in a course in the public VET system through a technical and further education (TAFE) institute in Australia two years previously and were not enrolled in the target year and had not successfully completed any module
- ✧ those who failed at least one module two years previously, had not completed a qualification, and were not enrolled in the target year
- ✧ those who had not completed all of the modules required to graduate for a qualification two years previously, and were not enrolled in the target year.

Longitudinal survey of apprentices and trainees

The main aim of a longitudinal survey of apprentices and trainees is to provide data on their backgrounds, progress and outcomes in order to have a better understanding of the long-term impact of contracted training on career paths and earnings. The profiling of apprentices and trainees currently undertaken using administrative data provides important information on issues such as completion and non-completion. However, it does not provide data on the behavioural factors associated with completion and withdrawal, nor on the impact of apprenticeships and traineeships on career paths and earnings. This requires longitudinal survey data.

It is suggested that the Canadian National Apprenticed Trades Survey (Statistics Canada 1997) be used as a model for the survey. The Canadian survey collects information for comparing and contrasting the labour market activities of completers and discontinuers. It examines the relationship between apprenticeship training and occupation two to three years after apprenticeship, and the factors associated with discontinuing an apprenticeship program. The target population for the survey covers both completers and non-completers from a given period. Data are collected by telephone interview approximately two years after leaving or completing apprenticeship training. In an Australian context the sample could be drawn from NCVER's National Apprentice and Trainee Collection.

If based on the Canadian model, the approach requires selection of a stratified randomly selected sample of apprentices and trainees for a given target year. In 2003, according to national figures on Australian apprentices and trainees, there were 117 800 completions and 122 700 withdrawals from apprenticeship and traineeship programs (NCVER 2004). If the survey sample were to be stratified by state/territory, age and sex, then to derive state and territory estimates with a confidence level of 95% and a 5% confidence interval would require an achieved sample of approximately 3200 completers and 3200 non-completers. This would be based on an individual state and territory sample size of 400 completers and 400 non-completers. These sample sizes would provide robust and reliable estimates at a national level. If further stratification were desired to disaggregate the sample by training package or qualification level, then larger sample sizes would be required.

Introduction

Overview

The Centre for Post-compulsory Education and Lifelong Learning at the University of Melbourne was commissioned to investigate the development of appropriate methodologies for undertaking (a) a survey of vocational education and training (VET) non-completers, and (b) a national longitudinal survey of apprentices and trainees

Current destination surveys of VET students tend to be focused on those who complete their courses or who complete parts of their courses, such as modules. The annual Student Outcomes Survey, for example, provides information on the outcomes and experiences of students who graduate or complete at least one module of study or training (NCVER 2004). There is no national follow-up of those students who drop out of VET programs. VET non-completers are a difficult group to contact and survey, and yet there is a need to find out why, for example, they drop out, what other options they have pursued, what their intentions are towards work or further study, what their characteristics are and what courses they left. This information is important for providing planners with information to help improve delivery and provision. It is also important in providing benchmark data for evaluating how effectively the VET system is meeting current needs, and for monitoring improvements.

Similarly, there are no adequate longitudinal data on apprentices and trainees that can help in an understanding of the long-term impact of contracted training on career paths and earnings. This sort of information is significant in the context of concerns about the responsiveness of the apprenticeship and traineeship system to labour demand developments and how successfully it produces an adequate supply of well-trained workers. A longitudinal survey of apprentices and trainees is one way of gathering data on how effectively the apprenticeship and traineeship system is working to meet the needs of both the labour market and participants. It would provide valuable information on the returns to apprenticeship and traineeship qualifications. Since a tracking study is a major undertaking, an initial piece of work is needed to examine the options for such a study based on similar surveys undertaken overseas as well as in Australia.

This study was established to undertake an investigation into appropriate methodologies for a survey of VET non-completers and a longitudinal survey of apprentices and trainees.

The investigation of survey methods

The investigation was undertaken in several stages. The first stage involved an extensive review of research and literature detailing similar surveys conducted in Australia and overseas. It provided information on different approaches that have been used to undertake similar surveys, as well as raised issues that need to be considered in developing the methodologies. From this review an issues paper was produced outlining a range of options for consideration with respect to the development of the two surveys.

The second stage comprised a series of workshops and interviews with a range of key agencies (including the Australian National Training Authority [ANTA], Department of Education, Science and Training, Office of Training and Tertiary Education, Office for Post-Compulsory Education and Training) to canvass views on the options and issues raised from the review of methodologies. Consultations were also conducted with officers and senior managers from the following organisations:

- ✧ Queensland Department of Employment and Training
- ✧ Commonwealth Department of Education, Science and Training
- ✧ Tasmanian Office for Post-Compulsory Education and Training
- ✧ Victorian Office of Training and Tertiary Education
- ✧ Australian National Training Authority
- ✧ National Centre for Vocational Education Research.

The consultations canvassed views on the definitions of concepts and groups, dimensions of the surveys, the nature of samples, the focus of questions to be asked, methods of data gathering, desired response rates, and the frequency that data are required.

The final stage involved the preparation of a report outlining the strengths and weaknesses of alternative methodologies and provided options on ways of conducting the two surveys.

Structure of this report

The report is divided into three parts. The first part is an introduction. The second part deals with the VET non-completers survey. It presents the findings from the review of literature on non-completion studies undertaken in different parts of the world. It provides a broad overview of methodologies adopted for similar projects both within Australia and overseas. Overseas countries that have been examined include Austria, Canada, Denmark, England, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Spain, and the United States. Definitional issues that need to be addressed in the design, development and conduct of the survey are also considered. A particular focus is on how completion and non-completion is defined and examined. The author's suggestions for this survey are included in the last section of part 2.

The third part of the report looks at longitudinal surveys of apprentices and trainees. It draws together the findings from a review of similar surveys undertaken both in Australia and overseas; the author's preferred option is discussed in the last section of this part.

Basic requirements

The collection of data for providing information for (a) an evaluation of VET non-completion and (b) the longer-term outcomes of apprenticeships and traineeships must meet a number of basic requirements. These are listed briefly below and are discussed in the body of this report in relation to each of the surveys under investigation.

- ✧ There must be a clear view of the goals of the survey to help identify data requirements and frequency of data collection. There is little value in collecting information if its purpose is unclear.
- ✧ There must be clear definitions of the key concepts and categories covered in the survey.

- ✧ The samples must be structured to provide representation of the main categories of VET participants. This means that the samples must be large enough to provide reliable estimates of important groups and sub-groups.
- ✧ The method of data collection must provide accurate estimates of what is being measured. If the data are collected by survey, then there must be reasonable response rates.

Non-completers of VET survey

Introduction

The national objectives for vocational education and training, according to the ANTA national strategy for VET, *Shaping our future*, include the aims of encouraging stronger pathways in VET, and between VET and employment, and improving training and employment outcomes for all people (ANTA 2003). Data to measure how well the VET system is achieving these goals need to include information on the experiences, backgrounds, participation, motives and outcomes of those who do not complete their study or training as well as those who do. Currently, information is collected regularly on the outcomes and experiences of VET qualification and module completers, but not on those of non-completers.

Despite the expansion in participation within VET over the last decade and the growing output of graduates throughout this period, recent estimates indicate that the percentage of students who started a qualification or a module and did not complete has remained much the same (Foyster, Hon & Shah 2000). However, this now amounts to a considerable number of people who do not complete. There is a legitimate concern about the effects of withdrawal from VET upon the individuals concerned and how this rate could be reduced. Who are these leavers? Why do they leave and what happens to them subsequently? By having such information it will be possible to identify the reasons some participants discontinue their study and what effect this has in terms of their work and other activities.

For example, it will be possible to identify whether or not non-completion is linked in any way to particular groups of participants (such as the increasing number of non-traditional VET users) or to the quality of particular programs or delivery of training. Such information has the potential to better target the needs of different groups of participants and the provision and delivery of VET programs. It will also be possible to examine the consequences of non-completion in terms of the relative effects on employment and earnings.

Therefore, one of the main aims of a survey of non-completers of VET is to collect information on the characteristics and outcomes of those who undertake VET courses but who do not complete them. Developing and undertaking such a survey raises sets of definitional and methodological issues that need to be examined. The next section will present some of the definitional issues. The following sections will outline some of the approaches taken by other researchers and the methodological issues they raise for conducting a survey of non-completion in Australia. The final section of this part of the report contains the author's suggestions regarding a survey of VET non-completers.

Definitional issues

Internationally, the drive for accountability now encourages a stronger emphasis on completion data as a key performance measure in VET. However, completion and non-completion have

become less easy to define. For a start, patterns of education and work have become more varied. Some people are taking more time to study and spending varied periods of time in and out of education and training courses. These patterns make it more difficult to establish 'cut-off' points for estimating non-completion. Another issue is related to intentions. Some participants enrol in certificate courses but only ever intend to complete components of the course, such as a module (or modules). While such participants are certificate non-completers, they are completers in terms of their original intentions.

In an environment where lifelong learning is promoted and encouraged, with increasing emphasis on credit transfer, recognition of prior learning, and articulation between courses and sectors, traditional measurements and conventional indicators may be inadequate. Lifelong learning theory in particular promotes the notion of the individual as embodied educational capital—a continuing work in progress, an individualised portfolio of acquired skills and dispositions. But our modes of measurement tend to be both institution-based and dependent on inflexible measures of training use, which are unable to reflect behaviours such as movement between courses or extended programs of study with significant breaks between modules—both of which would generate 'non-completion' status.

In reflecting on these factors in the context of further education, McGivney (1996, p.25) has argued that 'increasing flexibility conferred on individual learning patterns by credit transfer schemes, modularisation and different learning modes has made it difficult to fit student behaviour into narrow definitions of completion and non-completion'.

Added to these factors is the issue that VET provision itself is becoming increasingly complex. There are:

- ✧ a broader range of users, increasingly diverse across different age groups and educational backgrounds
- ✧ a broader range of participant needs, for example, pre-vocational, labour market entry, reskilling, applied studies
- ✧ a broader range of courses and programs
- ✧ a stronger focus on relationships with labour markets, requiring more responsive, more effective programs and delivery.

There is also the issue of coverage and the increasingly diverse range of VET providers that can include:

- ✧ TAFE colleges
- ✧ higher education institutions
- ✧ other government providers (for example, agricultural colleges)
- ✧ community providers
- ✧ government-funded registered private providers
- ✧ schools funded through the government allocation to TAFE
- ✧ group training providers.

Australian and overseas approaches to surveying non-completers

Research into non-completion in some sectors of education, such as higher education, is well developed. However, comparable research into non-completion in the VET sector is more

difficult to find and certainly less systematic in the Australian context (see McInnis et al. 2000). However, in Australia and overseas there has been a growing awareness of the need for the monitoring of levels of non-completion and investigation of the destinations of non-completers. Several approaches have been taken to surveying non-completers.

Australia

One approach in Australia is based on the use of administrative data. Student progress, completion and non-completion in different VET programs have been undertaken using the national VET provider collection of student information reported against the Australian Vocational Education and Training Management Information Statistics (AVETMIS) Standard. The study of student flows by Foyster, Hon and Shah (2000) examined completion rates by taking the final achievement of students who commenced courses in 1994 as at the end of 1996. Students who re-enrolled in 1996, but did not complete their course by the end of the year were classified as continuing.

Using administrative data in this way to examine completion and non-completion, it is possible to gain quite detailed estimates disaggregated by provider-based classifications such as institution, state, region, field of study, stream, and certificate level, as well as by broad participant group, such as males, females, age, employed/not employed, location, disability and language background. Accepting the difficulties associated with definitions of completion and non-completion, such analyses can tell us a lot about the size and broad dimensions of non-completion. Statistical modelling using such data is also possible (see, for example, Foyster, Hon & Shah 2000).

There are some difficulties in estimating completion and non-completion using centralised data, due to 'inadequacies and complexities in the administrative data collections' (Ray et al. 2000, p.4). Outside the issue of the adequacy of administrative data, and accepting that such data can provide important information on some of the dimensions and characteristics of non-completion, there is the issue that analyses using such data can tell us very little about the reasons for non-completion and the outcomes of non-completers. To do this requires surveys of the non-completers themselves, surveys which attempt to establish the factors behind decisions to abandon study, their activities, and their outcomes. Several types of surveys have been undertaken in Australia to obtain such information: longitudinal, cross-sectional, case study, and key agency.

Longitudinal surveys

There are several examples of longitudinal surveys of VET participation relevant to examining non-completion and outcomes.

Davies (2001) reports on a longitudinal survey of VET students undertaken by the Educational Outcomes Research Unit at the University of Melbourne. The national study is organised around students' experiences of learning in TAFE and their own reporting of their study intentions and their outcomes. It draws on data derived from 7566 technical and further education (TAFE) students around Australia. Groups of students were selected by their institutions for participation in the survey on the basis of their enrolment in particular certificate levels (certificate I through to advanced diploma) and fields of study (VET multi-field, business, engineering, hospitality). Students responded to an extensive self-complete questionnaire during class in June 2000 and are being followed up each year by telephone interview. From the follow-up it is possible to identify non-completion, the reasons for non-completion and the outcomes for non-completers.

Data from the Longitudinal Surveys of Australian Youth (LSAY) conducted by the Australian Council for Educational Research have also been used to estimate non-completion and outcomes. Using data covering four periods—the late 1970s, early 1980s, late 1980s and early 1990s—Lamb, Long and Malley (1998) examined completion and non-completion rates across a range of VET programs. They also examined the outcomes of participants. The sample covers students participating in a wide range of programs; however, they are restricted to young people (ages 15 to 30). The survey is useful for examining what happens to non-completers as well as completers, but it has limitations. One is that the survey covers a cohort of young people, not only those who participated in VET. It means that sample numbers of VET participants, particularly when broken down into separate programs or categories of young people, can become small, and the disaggregated estimates of non-completion and of outcomes less reliable. Also, information on program participation (for example, Australian Qualifications Framework [AQF] levels, fields of study) has changed over time and is not sufficiently or consistently tracked to provide for good estimates across the variety of categories of VET. While the method of data collection has varied over time in these longitudinal surveys, annual telephone interviews are the main form of data collection after initial school contact using self-complete survey instruments.

Cross-sectional surveys

There have been quite a few surveys of VET participants and non-completers. Grey et al. (1999) in their study of traineeship non-completion undertook a survey of approximately 1700 trainees who did not complete their traineeship. The survey was undertaken in December 1997 and covered a sample of full-time trainees who left their traineeship without completing during the three months up to and including September 1997. The sample was identified from the administrative data held by the then Department of Employment, Education, Training and Youth Affairs and the survey was undertaken using a telephone interview.

The Student Outcomes Survey undertaken by NCVER is a survey of completers rather than non-completers. However, the approach is an example of a cross-sectional sample survey used to collect information on the outcomes of VET participants. The survey is a national survey of students who undertook VET during the previous year at a TAFE institute in the public VET system in Australia. Information is collected on two groups of students: graduates and module completers. Graduates are defined as students who completed the requirements for their course during the previous year in a TAFE institute in Australia or were awarded a qualification as recognition for prior learning. Module completers are students who successfully completed at least one module during the previous year and were not a graduate of a TAFE institute. The survey involves the mailing of questionnaires to a randomly selected sample of graduates and module completers. The sample is derived from the Australian Vocational Education and Training Management Information Statistics Standard database. In 2001, the sample was stratified by TAFE institute, field of study, gender and age.

Another example of a cross-sectional survey is provided in the study undertaken by Grant and Foyster (2001) on VET course non-completion in three states. Initially in their study they undertook a statistical investigation of the numbers of non-completers, using data provided by further education and training state authorities in New South Wales, Victoria, and Western Australia. The statistical investigation, dealing with course outcomes, sought to identify the structural factors of the course which impacted upon its completion. The authors identified issues associated with the identification of completion and non-completion from administrative records:

> There are differences in the ways in which states collect and record data, and the ways in which the samples for this study were drawn, making comparisons between the states inappropriate. Thus the NSW sample was drawn on the basis of courses in which students were enrolled using centrally maintained records of course completions. In Western Australia, while the sample was drawn from course enrolments, the record-keeping system

> is directed towards module completions, and the recording of course completions requires a student initiative. In Victoria course enrolments are inferred from module enrolments, and course completion data will reflect this. Because of these variations in practice, the emphasis in this study is upon the identification of factors within a given state.
>
> (Grant & Foyster 2001, p.4)

A second phase of the study involved telephone interviews with a sample of non-completers identified from records provided by authorities in each of the states. Participants had been enrolled in TAFE courses at one point in time and had left study before completing their courses. The interviews were designed to collect detailed information about reasons for non-completion.

Callan (2000) employed a similar design in the study of apprenticeship and traineeship non-completion in Queensland. He estimated the levels of non-completion using information from the state training authority database (DELTA) which tracks every recorded training agreement to its outcome. He then distributed a mailout questionnaire to a stratified sample of 1500 apprentices who completed their training and 1500 trainees who did not complete their training. The responses led to a final sample comprising 542 trainees and apprentices who provided information on six main areas of information: opinions on the training provided by the employer; opinions on the training gained off the job; general satisfaction levels; reasons for non-completion; current work situation; and background information.

A more recent study by Callan (2004) examined the characteristics and motivations of VET students in 2002 who did not complete any of the subjects they had been enrolled in. A range of methods were used in the study, including interviews with TAFE teachers and administrators, as well as with students who had no record of achievement. The Queensland and national Australian Vocational Education and Training Management Information Statistics Standard databases were used to identify students who did not complete any of the subjects they had been enrolled in. Analyses were then undertaken, comparing this group against TAFE students as a whole to identify differences in characteristics. A key component of the study was a mailout questionnaire to a sample of the 2002 VET non-completers in Queensland. The final number of responses (508) represented only about 12% of the original sample, but the survey responses provided detailed information on the reasons for withdrawing from study as well as factors that would have encouraged continuation.

Case studies (including focus groups)

In contrast to the large-scale survey approach, in-depth case studies of either providers, small groups of participants or both have been used to explore issues of non-completion.

Schedvin (1985), for example, examined the withdrawals of first year students at the Lincoln Institute of Health Sciences. While in the higher education rather than VET sector, it represents an example of the case study approach. In-depth interviews were held with 20 of the total number of 58 students. The group included both students who were described as temporary and those described as permanent withdrawals. Schedvin identified five basic types of reasons for withdrawal, including commitment to a prior goal, the need for 'time out', reality-testing a career, academic difficulty, and family-related factors.

Single-college studies such as that of Schedvin provide a useful source of information on non-completion. However, they do have some limitations, one of the main ones being that they are usually one-off and do not allow trend analysis.

Case studies involving small groups of participants have been conducted to explore a range of issues—quality of training, satisfaction, transition, as well as non-completion. Schofield (2000), for example, used focus groups involving small numbers of participants to examine the issue of

the quality of training in Victoria's traineeship system. Focus groups provide an opportunity to explore issues in much greater depth than can be done using questionnaires. As such, they offer potential to provide richer sorts of information on particular issues—significantly, in exploring the reasons for decisions such as course withdrawal. However, they tend to limit the number and range of people who can be included.

In-depth individual interviewing has also been used to explore circumstances and behaviour of non-completers. Schedvin's study of interviews with non-completers is one example. Such techniques can also be used within a longitudinal survey design. Holden and Dwyer (1992) studied a small group of early school leavers using lengthy face-to-face individual interviews to collect information. The group of respondents was followed up annually using the same procedure to examine pathways and changes in circumstances and outcomes. Again, such approaches can provide illuminating descriptive material on choices and outcomes. Coverage of the range of institutions, courses and categories of participants remains an issue.

Key agency surveys

A further approach to the investigation of non-completion is the use of key agency surveys. Key agency surveys are sometimes used in the study of welfare needs. For example, a study of youth needs in the Gippsland Region of Victoria (Lamb 1987) employed a survey of agencies and individuals involved in the provision of services to young people. The survey included interviews with agency staff and questionnaires on the factors shaping youth needs across a range of areas of social welfare.

An example in the area of VET non-completion is provided by Callan (2000) who conducted, as an initial part of his survey of apprenticeship and traineeship non-completion, a survey of staff from the regional offices of the Queensland Department of Employment, Training and Industrial Relations. Respondents included regional directors, assistant directors, district managers and regional training consultants. The survey sought the insights such personnel had on the issue of non-completion. Respondents in the Callan survey nominated a range of difficulties with employers as responsible for low completion rates. These difficulties ranged from a lack of understanding on the part of employers of their responsibilities, the role and need for commitment to incidences of bullying, abuse and non-payment of entitlements. However, changes in the interests or circumstances of the apprentices and trainees, as well as personal problems were also cited as causes of non-completion.

United States

In the United States, at a national level, completion data for certificates in vocational studies are viewed as unreliable. Although certificates are most closely linked to labour market demands and are promoted in schools, community colleges and universities, there is no comprehensive nation-wide system to gather and report data on certificate enrolment and attainment, even for sub-baccalaureate or post-baccalaureate certificate programs operated by public colleges and universities, let alone private and industry-based providers (Wonacott 2000). This paucity of information contributes to some of the cloudiness regarding outcomes in vocational education—the vexed proposition, for example, that non-completion in areas of vocational studies actually yields more positive employment and salary outcomes than attainment of a credential (Wonacott 2000).

In view of the paucity of quality national administrative data on VET, approaches using other sources of data have been used to study completion and non-completion. There are two main approaches adopted in the United States to the analysis of non-completion. They can be described as provider surveys, and cohort studies. Provider surveys involve studies of students undertaken by individual colleges and providers or by local authorities based on small numbers

of providers. Cohort studies generally involve national samples of students using longitudinal survey designs.

Both provider surveys and cohort studies offer valuable data on completion and non-completion. At the institutional level they are geared toward monitoring institutional effectiveness, especially in relation to success (or otherwise) in dealing with particular groups of students. Increasingly, however, demands are being made for finer-textured analysis which is able to recognise and accommodate emerging features of post-secondary student populations and their behaviours.

Bailey and Keinzl (1999), for example, have recently examined the implications of the *Carl D. Perkins Vocational and Technical Act* of 1998. The act prescribes a set of performance indicators designed to promote continuous program improvement in vocational education, with a specific focus on improved accountability. Bailey and Keinzl argue that the conventional linear approach to various staging posts in post-secondary students' progress—enrolment/access, retention, completion and attainment—is not necessarily the best tool for dealing with contemporary students, their demands on their institutions and their approaches to their learning. They point, for example, to various aspects of student activity—especially in the context of vocational learning—which are only imperfectly reflected using conventional outcomes measurement. These include interrupted attendance, multiple cross-institutional enrolments and a growing use of non-certified training ('competence without credentials').

As such, they urge a more creative use of existing databases, together with the development of datasets which better reflect contemporary student circumstances. A more accurate picture of pathways, for example, requires supplementary information about student *objectives* when embarking on a qualification, proposed *timing* of the course, enrolment *intensity* (numbers of modules or units taken), continuity, credit, transfer data and employment status. It is also argued that individual-based data are of more assistance in developing accurate student profiles than institutional data which often fail to adequately report students' involvement with other educational providers or transfer information (exit or entry).

This view is supported by researchers such as Adelman (1999) who was able to establish (using longitudinal data sets) that over half of all community college students had attended more than one institution while undertaking their study. His work showed that in recent years increasing numbers of students had used more than one college to attain their qualifications or course credits. Institutional-based data, such as that collected for the Integrated Post-Secondary Education Data System, failed to reflect this phenomenon, instead reporting high numbers of 'non-completions' (National Center for Education Statistics 2000). The 'snapshot' nature of such data, it is argued, gives a much more pessimistic picture of college completion than is actually warranted.

Even so, the question could be asked: could students' needs have been better met if they had been able to undertake their study at the one institution? What prompted the peripatetic behaviour? Was it dissatisfaction with the initial provider, or inflexibility in delivery of the provider, or was it simply due to the general mobility among students?

In 2000, an evaluation program was formulated for the National Assessment of Vocational Education. Its brief was to increase accountability in vocational education and especially to document the effect of recent changes in vocational education funding on student participation, progress, outcomes and workforce development (National Assessment of Vocational Education 2000). For accountability purposes researchers are keen to explore economic benefits of occupational programs, and to gauge differences in returns by qualification level, field of study, completion status and student sub-groups. Thus key research areas are identified as:

- ✧ enrolment trends

- ✧ reasons for participation
- ✧ importance of degree or course completion
- ✧ labour market returns for completers and non-completers.

Other research issues focusing on behaviours and needs of student populations include:

- ✧ What are emerging post-secondary educational pathways?
- ✧ How efficiently do students progress towards goal completion (as opposed to course completion?)
- ✧ What are persistence patterns?
- ✧ Do students' completion rates or behaviours (for example, the extended completion pattern, taken over a longer period than might be expected) vary according to student characteristics?
- ✧ What are the factors contributing to stronger persistence or higher completion rates?
- ✧ How are they affected by differences in goals and pathways?

It is noted that all research questions would require use of institutional and student-based datasets, together with targeted case studies.

Provider surveys

The United States college sector has a history of provider-level survey work on student outcomes which provides a background for examining completion and non-completion. Provider-based studies are geared towards improving student outcomes but are not necessarily consistent in definitions or focus. Examples of the approaches are offered below.

One example is provided by the many colleges that 'follow up' students who fail to complete courses in which they enrol. This approach is exemplified by an instrument developed to survey students who were enrolled in the Indiana Vocational Technical College and who left prior to completing their program (Parker 1978).

The Task Force on Institutional Effectiveness Measures, established by the State Board of Directors for Community Colleges of Arizona, developed measures distinguishing completion and attainment—some students could 'complete' their course but not attain a satisfactory level of achievement to receive a certificate (McCown 1994). The measures included *completion* rates of vocational students, *numbers* of certificate and degree recipients, and *pass* rates of certification or examinations.

Other distinctions were highlighted in a localised study of institutional effectiveness in Arizona where different measurements were applied to vocational and other courses: outcomes were determined through ratios of enrolment versus success in vocational courses, and completion rates for degree and certificate programs (McCown 1994).

Completion need not be confined to full-course students. In 1992, a survey was conducted of two subgroups of students who had enrolled for less than six credits in one of the seven community colleges in Minnesota during Fall 1990, and who had not re-enrolled as of Fall 1992. The two subgroups surveyed included those classified as 'completers' (completing at least 60% of their credits at a specified grade point average), and those identified as 'non-completers' (not completing any courses) (Taylor & Flermoen 1993).

Other studies distinguish between those who graduate and those who, although completing, receive no formal award. In 1984, a follow-up survey was conducted to gather data about the activities and perceptions of Lane Community College students after leaving the institution. The

survey focused on graduates, 'no formal award completers' and 'early leavers' of the 50 vocational programs offered at this college (Jordan 1985).

The reporting profile required for conformity with the Carl Perkins legislation (which governs federal funding of vocational education) requires data returns on certificate program completion and on completion status. In Wisconsin, guidelines for administrators provide a range of completion categories for annual returns. For course completion status, options are reported as:

- Student has met course requirement and has been or will shortly be awarded a certificate.
- Student is continuing in program.
- Student left program before completion.
- Student completed program but did not meet criteria for award of certificate (Wisconsin Department of Public Instruction 2001).

Cohort studies

Nationally representative longitudinal studies have been undertaken by research bodies such as the National Center for Education Statistics. These track students through various phases of education, training and labour market participation, developing progressive profiles of outcomes over time. Examples include:

- the National Educational Longitudinal Study which studied a cohort of 25 000 8th graders in 1998 every two years until 1993, and then again in 2000
- the Beginning Post-secondary Students Longitudinal Survey which included students of all ages who enrolled in postsecondary education for the first time in either 1989–90 or 1995–96.

Both groups were re-surveyed some years later to establish pathways and outcomes.

Current datasets of relevance for scrutiny of vocational education performance include:

- Beginning Postsecondary Survey*
- National Household Education Survey*
- National Postsecondary Aid Survey*
- Baccalaureate and Beyond*
- National Education Longitudinal Study*
- High School and Beyond*
- Survey of Income and Program participation
- Current Population Survey
- Integrated Postsecondary Education Data System.

(The asterisked surveys are cohort-based longitudinal surveys.)

Canada

The main approach taken at a national level in Canada to the collection of information on VET completion, non-completion and outcomes is through sample surveys and administrative records.

Sample surveys

Statistics Canada undertakes a national Adult Education and Training Survey. The survey is attached to the Labour Force Survey (Statistics Canada 1997). Interviewers for the Labour Force survey conduct telephone interviews for approximately 46 000 households (this number varies by survey year). Within each household one respondent, aged 17 or older, is randomly selected to respond to the questions regarding adult education and training. The survey population is all persons aged 17 years and older living in the ten provinces, excluding persons living on Indian reserves and excluding full-time institutional residents.

The Adult Education and Training Survey aims to provide a comprehensive picture of adult education and training in Canada. The survey enables analyses to be conducted in areas such as age, sex, marital status, income, educational attainment of participants, employer commitment, method of learning, types of activities, field of study, hours invested in learning and more. The large number of variables contained in the survey database permit analyses which are quite specific (for example, number of persons with pre-schoolers in the home who are enrolled in university programs) or very general (for example, participation rates of females in adult education and training in Canada). Survey data also permit extensive comparisons to be made between adults who participate in education and training and those who do not participate. Information gathered through this survey can enhance interpretations developed through other research activities on labour force transitions, industrial change, the impact of technology, changing funding from governments for education and so on. Respondents provide information for all credit and non-credit programs, courses, seminars, workshops, tutorials etc. taken in the previous calendar year. Included in the data is information on course completion and non-completion and current activities.

Statistics Canada also undertakes periodic graduate surveys and follow-up surveys. The graduate surveys are undertaken two years after graduation and the follow-up surveys five years after graduation (Statistics Canada 1997). The objectives of the follow-up surveys are to obtain information on the exposure of graduates to additional training, employment and occupation, the relationship between education/training and labour market activities and the longer-term labour market experiences of graduates.

The survey's base population is graduates from Canadian postsecondary education institutions who completed the requirements for degrees, diplomas, or certificates. The population excludes:

- ✧ graduates from private postsecondary education institutions
- ✧ those who completed continuing education courses at universities or colleges (unless they led to degrees or regular diplomas or certificates)
- ✧ those who took part-time trade courses while employed full-time
- ✧ those who completed vocational programs lasting less than three months
- ✧ those in apprenticeship programs
- ✧ graduates of basic training or skill development programs
- ✧ graduates of military colleges.

The follow-up surveys use telephone interviews to collect information from graduates. Interviewers attempt to contact all respondents from the previous National Graduates Survey. The 1991 follow-up group survey was able to obtain information from 88% of the 40 814 graduates of the 1988 National Graduates Survey. On the other hand, the 1995 results were derived from 85% of the 36 280 individuals included in the 1992 National Graduates Survey.

Administrative data

Two sources of data are available through administrative records: the Community-College Student Information System and enrolments in trade/vocational programs (Statistics Canada 1997).

Using administrative data, the Community-College Student Information System database provides enrolment and graduate statistics Canada-wide from community colleges and other institutions generally considered part of the publicly funded Canadian college system. These data are collected from college or provincial ministries of education administrative records, electronic files or from a questionnaire completed by a representative from the agency. The data are provided by all institutions offering non-university postsecondary programs in every province and territory. The survey identifies returnees to the community college education system (those who have left their initial cycle of education, whose main activity in the last twelve months was not attending school and who have now returned to the formal college education system) and contains information such as demographic variables, types of programs taken, years invested in learning, previous educational experience and duration of program. Comparative analyses are possible between returnees, continuing students and new students. The survey reports on all students registered for programs which are eligible for academic credit in a diploma, certificate program or in a university transfer program. Also included are students registered in co-op programs who are on a work assignment at the time of the survey. Students registered for diplomas or certificates awarded by a professional body are reported if such programs form part of the regular offerings of the institution.

For the survey of enrolments in trade/vocational programs enrolment information is gathered on an annual basis from community colleges, public vocational institutions, schools for nursing assistants and other special vocational schools in Canada where trade/vocational programs are offered. Variables include age, sex, marital status, full- or part-time attendance status, field of study, enrolment, number of completers and discontinuers, type of programs, duration of studies, sponsorship, geographic source of student and so on. Data are available at an individual level.

The survey population covers all students in full- or part-time trade/vocational programs at public post-secondary institutions. Although information is gathered about students, the information is collected through administrative records of trade/vocational education institutions. For the survey, individual and aggregate data are collected for enrolments. In the event that student records cannot be collected, institutions are asked to provide enrolment numbers by program level. Aggregate data received from the institution are then disaggregated to the individual level. Information on completion and non-completion is compiled from the records.

England

There has been growing interest in the United Kingdom in the collection of data on completion and non-completion in vocational education and training. As with the schools and higher education sectors, the further education sector in the United Kingdom places a strong emphasis on benchmarking among colleges and other vocational education providers. This has made administrative data the main source of information on completion and non-completion. A survey of colleges showed that, in response to funding body requirements, colleges now collect detailed information on student retention and withdrawal patterns (McGivney 1996). Key measures include *retention* and *achievement*.

The Learning and Skills Council was created in 2001 to assume the role earlier played by the Further Education Funding Commission. With a brief to improve quality and standards in VET,

it has established a fairly rigorous data-collection system enabling analysis of individualised student record returns. Using these data, the council releases extensive reports documenting completion, non-completion and outcomes by college, qualification level, region etc. 'The distribution of national benchmarking data on student retention and achievement allows colleges to assess their performance and assists their planning of action to improve the retention and achievement rates of their students' (Learning and Skills Council 2004).

Using this centrally collated administrative data, reports have been produced showing that lower-level courses have lower completion rates (around 75%), with completion rates rising by qualification level to around 93% for higher diplomas. Completion does not automatically entail 'achievement'—analysis and benchmarking reports highlight differences between these two measures.

For measures of completion and non-completion, retention rates provide important indicators; these are calculated on numbers of students continuing or completing divided by those who initially commenced the qualification.

Other measures such as achievement are more problematic. Two measures of 'achievement' are made—one taking qualification achievement rates of all who complete, and one taking qualification achievement rates of all those who complete and for whom there is a known outcome. Current benchmarking excludes partial completion as a measure (unlike earlier Further Education Funding Commission measures) and that partial completion (such as modules) is registered as non-completion. The baseline achievement rate is the number of qualifications students have fully achieved divided by the number of completed qualifications with known outcomes. Thus a 76% achievement rate means 24% of completers have failed their course.

As part of the student data-collection system requirements, information is collected as a matter of course on completion intentions. Student data collected at the institutional level include a field on qualification aims, so that it is possible, on follow-up, to ascertain the degree to which aims have been met.

Key Learning and Skills Council documents on this area include:

- ✧ student numbers
- ✧ in-year retention
- ✧ achievements and destination at colleges in the further education sector
- ✧ external institutions
- ✧ further education student numbers in higher education institutions in England.

As with recent United States literature, key research themes in the United Kingdom deal with issues involved in adequately and accurately reflecting a sector whose functions and client base are much more diverse than those of either the schools or the higher education sector.

Researchers point to the ever-widening group of further education students, the diversity of their demand—workforce preparation, workforce re-entry, preparation for study, up-skilling for current workers, and retraining. They emphasise the effect of 'new' learners in the colleges—non-traditional learners who may have had little experience of further education or study. The realignment of schools, further education and higher education in changed articulation arrangements (through credit transfer, recognition of prior learning and the movement of students from VET to university) and the assumption of responsibility for new learning populations are also themes of particular relevance in an expedited flow of students on new pathways between or within the sectors.

Here the focus moves beyond data collection to more precise concern about students' own objectives: what do they want out of their study; how do they propose to achieve those ends; to what extent are they assisted or impeded by current institutional structures and how do they experience their learning? With better data on student aims and outcomes, is it possible to develop a more appropriate pedagogy designed to optimise their objectives? (Green & Lucas 1999).

Ireland

Several studies using sample survey designs have been used in Ireland to examine non-completion.

One example was concerned with factors likely to contribute to student withdrawal from vocational courses in colleges of further and higher education (Adamson & McAleavy 2000). The method involved posting questionnaires to all non-completing students from colleges across Northern Ireland. The questionnaire was designed to elicit responses in six specific areas: biographical details, motivational disposition, initial interactions, perceived satisfaction with course and college, reasons for terminating, and current status. The aim was to provide an account of students' backgrounds, their expectations, perceptions and experiences of both the vocational course and college, and to compare reasons for withdrawal with previous findings from research. The survey obtained 165 responses from non-completing students. Findings indicated that non-completion was not driven by pre-entry deterministic factors, but, rather as a result of a complex decision-making process with an array of factors impacting on the student.

Another example was a study which monitored training outcomes for people with disabilities who left European Social Fund or Training Opportunities Programmes between July and December 1998 (EIM Business and Policy Research 2002). The fieldwork for the follow-up survey of 1998 leavers was carried out between July and September 1999. It involved a questionnaire mailed out to participants identified from institutional records. The main findings were as follows: 37% of 1998 leavers were in a job, compared with 34% in 1996 and 1997; the proportion who were at home/unemployed decreased from 31% in 1996 to 26% among the 1998 leavers, while the proportion attending a centre was similar to the previous year—33%; over half of the 1998 leavers who indicated that they were attending a training centre at the time of the survey were back in Training Opportunities Programmes training again, and 27% were engaged in sheltered work; over 40% of leavers who had been on Level 2 and Level 3 training were in a job at the time of the survey; as in previous years, Training Opportunities Programmes leavers were the most likely to be back in a centre; in contrast with other years, unemployment for level 3 leavers was high at 35%. Those with a learning or a physical disability were more likely to be in a job than those with a mental health difficulty as in previous surveys. Attitudes to the training received by participants were positive. There has been a continuous improvement since 1995 in the proportion of leavers in a job receiving certification as a result of a training course but less than one-third of unemployed leavers in 1998 received certification as a result of their training.

Other European countries

As some European countries don't maintain a post-secondary vocational education system as such, comparability is limited in many cases. Apprenticeships or dual systems of training have declined in importance in countries such as the Netherlands, the United Kingdom (although a resurgence is occurring) or France (despite recent signs of reinvigoration), while others (Germany a most marked example, but also Austria, Denmark) focus their very strong vocational education programs on initial secondary school provision followed by workplace-based learning.

Within those parameters some attention has been given to issues of attrition in VET, completion of programs, and identification of means of combating non-completion.

In Holland the 'achievement rate' in VET in the mid-1990s was 86%—14% left early with no qualifications in their initial enrolments (Research Centre for Education and the Labour Market 1997). Not all in this group of early leavers were 'dropouts', almost half returning to undertake a different program (Research Centre for Education and the Labour Market 1997). Reasons for non-completion and premature exit included:

- ✧ participants themselves (lack of motivation)
- ✧ poorly designed courses (uninteresting)
- ✧ attraction of other courses
- ✧ attraction of labour market.

In Denmark recent studies carried out by the trades unions confederation show 'disturbingly high' rates of dropout among trainees doing company-based training—around 25%.

International comparisons of completion and non-completion have become more possible because of the introduction of agreed formats in administrative data collections. The Vocational Education and Training Data Collection was implemented as a database covering 238 VET programs in 15 European Union Member States. It has become an annual data collection. The main purpose is to gather comparable data on vocational education and training programs in the European Union. The statistics are compiled program by program. The main characteristics of each VET program, such as duration, completion, place of training and funding are collected. Detailed statistical data on participation in VET as well as some descriptive information are compiled. The data are based on individual state administrative databases.

Emerging methodological issues

Each of the approaches to measuring non-completion and the outcomes of non-completers has strengths and limitations.

Administrative data (such as that from the Australian Vocational Education and Training Management Information Statistics Standard database) provide a valuable means of estimating the levels of completion and non-completion, as well as information on patterns by provision (attributes such as program, qualification, provider, state, region, and field of study) as well as by student background (attributes such as gender, location, disability, employment, language background and age). However, it is not possible to examine employment and other outcomes, nor identify behavioural and other reasons for non-completion.

Longitudinal sample surveys (such as the Longitudinal Surveys of Australian Youth) provide a good means for measuring levels of completion and non-completion, as well as for exploring reasons for non-completion and short- and longer-term outcomes. Accurate estimates of completion and non-completion could be obtained by drawing a sample based on commencements and include information on intentions. Annual monitoring could then identify points of completion and non-completion, changes in status, transfers, and changes in institutions and courses with and without withdrawal—all issues that compound measures of non-completion. The main problems with longitudinal surveys relate to cost, sample attrition (which can be skewed), and breadth of coverage. The breadth of programs, fields of study and qualifications combined with the issue of sample attrition mean that large sample sizes would be required initially.

Cross-sectional sample surveys (such as the Student Outcomes Survey) can be undertaken by questionnaire (mailout or other) or by interview (telephone or other). They have the advantage that they can be flexible; for example, targeting specific groups of VET participants in one year, and other groups in another year. They can, like the Canadian follow-up surveys, be undertaken at any period following withdrawal or completion to examine outcomes and can collect information on reasons for withdrawal. One difficulty is that intentions and rationalisations reported by non-completers in this approach are collected retrospectively, making it more difficult to define completion/non-completion.

Case studies (of providers, programs, or students) can offer insightful, detailed and rich information on the reasons for non-completion (and the circumstances surrounding them) as well as outcomes, often in ways not possible using sample survey techniques. The descriptive and detailed information collected using case studies can often provide important theoretical and conceptual insights into issues. However, case studies are usually confined to small numbers and generalisability is a major problem.

Key agency surveys (such as that employed in Queensland) can provide important insights from key personnel involved with participants. Staff who have contact with groups of non-completers can often provide useful information on the reasons for non-completion and the circumstances surrounding patterns of withdrawal. This approach has limitations in providing detailed and accurate information on outcomes.

Within each approach, multiple methods can be employed. For example, it is possible to undertake longitudinal case studies, to employ longitudinal approaches using administrative data and to combine agency and case studies with sample surveys.

Some of the issues surrounding the approach are driven by the types of questions to be answered. For example, if the goal is to investigate national patterns of non-completion and outcomes and to derive national estimates of the reasons for non-completion, then case study approaches may not be appropriate. Similarly, if the focus is on exploring the motives behind decisions to quit programs, then in-depth interviews or focus groups may be better than mailout sample surveys.

Definition

An important issue is how non-completion is defined. Current definitions in the Student Outcomes Survey relate to graduates and module completers (who do not graduate). Recent surveys (for example, Grant & Foyster 2001; Davies 2001) suggest that some module completers intend to graduate, but withdraw and view themselves as non-completers. Others who do not graduate and do not complete modules can view themselves as completers. At what point is someone defined as a completer/non-completer? This has important implications not only in terms of estimating levels of completion and non-completion, but also in terms of identifying populations and drawing samples.

Another consideration is whether or not we need to know intentions upon entry into VET in order to be able to accurately classify non-completion. In the United Kingdom and Canada, a field is added to administrative data relating to the intentions to complete or not. If intentions are to be collected, it may well have methodological and design implications. For example, it would be preferable to collect study completion intentions upon entry rather than retrospectively upon exit, when all sorts of justifications and post hoc rationalisations may be applied.

Duration of time out of study is an issue. Harris et al. (2001) identify non-completion for apprentices through the use of a criterion linked to length of time out of study. They define a non-completer as an apprentice who 'leaves and does not re-commence within a two-year

period'. What happens with transfers, changes in courses, changes in institutions? What level of tracking is required to help identify different types of non-completion?

Finally, there is the consideration of the point of time at which outcomes are measured. The Student Outcomes Survey is undertaken in the year following completion. But the effects of completion/non-completion may not be experienced on earnings or employment for several years. Is the Canadian approach of a second and fifth year post-study outcomes survey approach beneficial?

Sampling

Some surveys of completers and non-completers involve a census rather than a sample survey. The early versions of the Student Outcomes Survey, for example, involved mailout surveys to the population of identified graduates rather than to a selected sample. The more recent versions have been based on a sample survey technique. While a census may have value in terms of coverage, it may not be necessary for the purposes of obtaining reliable estimates across the different groups and categories of VET non-completers. Apart from the issues associated with definition and identifying the population for surveying, there are substantial differences in costs associated with undertaking either a census or sample survey.

If a sample surveying approach is adopted, then judgements will need to be made about the size of the sample. This will depend in part on the questions that need to be addressed with the data and the extent of coverage. If the aim is to compare patterns of non-completion across all VET programs and to be able to derive state as well as national estimates, then larger samples may be needed. To derive estimates for different programs, across states, and types of qualification, the samples will need to be stratified to enable valid and reliable estimates to be derived across the different groups and strata. If the samples are to be stratified, then it will be necessary to make decisions about the criteria which will define the strata.

Sampling frame

As well as the survey approach, it will also be necessary to define the sampling unit. Currently, the aim of the VET non-completers survey is to derive estimates at the individual student level. The Student Outcomes Survey uses individual participants as the sampling unit. However, it is also possible to consider providers as the sampling unit and to use a two-stage procedure which initially samples providers and then participants within providers. This would enable reliable comparisons of providers as well as of student populations. The same could be applied to VET programs.

A sampling frame will need to be used to derive the population and/or sample. The national provider collection on students in conjunction with data from the relevant state/territory training authorities is one possible sampling source. Grant and Foyster (2001) used data provided from the records collated by three state training authorities to derive their sample of non-completers. Many surveys (longitudinal and cross-sectional) derive samples directly from providers—derived for local, state or national surveys—to undertake surveys of non-completers.

A two-stage procedure using, at the first stage, a stratified random sample of providers and, at the second stage, a random selection of students from within these institutions is one possibility. If this were adopted, the Australian Vocational Education and Training Management Information Statistics Standard database, state authority records, and individual providers would all be possible sources for a sampling frame. An example is provided by the Longitudinal Surveys of Australian Youth for which schools are the first unit of sampling and then students within schools. Course-based sampling provides yet another option (Moy 1999).

Case study approaches could be used with samples derived from either centralised administrative data held by NCVER, or from individual providers.

Method of data collection

A key issue for consideration in undertaking a survey of VET non-completers is selection of the most appropriate data collection method. The Student Outcomes Survey involves a mailout questionnaire. This method is less expensive than personal interviews and therefore is often used with populations or large samples, but low response rates can limit its effectiveness. This may well be an issue with VET non-completers. The highest attrition rates in the Longitudinal Surveys of Australian Youth and the highest levels of non-response are among those who drop out of study.

Another option, if large-scale surveying is preferred, is the use of telephone interviewing. This is the approach used in the Canadian outcomes surveys. Telephone interviewing provides for more in-depth exploration of reasons for non-completion, course experiences and outcomes. However, it tends to be more expensive than self-answer questionnaire approaches.

Both approaches present language and translation issues. If telephone interviewing is the approach used, then for VET non-completers who cannot speak English, it will be necessary to have interviewers available from relevant language backgrounds. If mailout questionnaires are used, it may be necessary to have the questionnaires translated into relevant languages for VET non-completers from language backgrounds other than English.

Case study approaches could also be used involving face-to-face interviews and focus groups that could be tape-recorded or recorded on questionnaires by interviewers.

Many studies amongst non-completers, particularly those from overseas, have been undertaken at a provider level and adopt an approach involving both quantitative and qualitative procedures, such as mailout surveys and case studies (with individual interviews). The multiple-method approach is one way of gaining an in-depth understanding of non-completion.

Suggestions for a survey of VET non-completers

As a result of the review and consultations on a survey of VET non-completers, it is suggested that:

- a survey of VET non-completers is undertaken regularly based on administrative data collected as part of the Australian Vocational Education and Training Management Information Statistics Standard collection
- the National Training Statistics Committee responsible for providing guidelines on the collection of VET statistics is approached to seek approval for the inclusion of a compulsory question on completion intentions at the point of student enrolments
- a survey of non-completers is conducted every three years to collect information on the experiences, views and outcomes of students who are identified as non-completers in the previous year.

There are several main aims in undertaking a survey of VET non-completers. One is to obtain information on who the non-completers are—their backgrounds, courses of study, and enrolment characteristics. Another is to find out the reasons why students do not complete their study or training in order to determine whether the rate can be reduced through support and targeted improvement. A further aim is to examine the outcomes of non-completers in order to assess the effects of withdrawal from VET on individuals.

Some of this information does not have to be collected from individuals themselves, but can be obtained through an analysis of administrative data. Using administrative data for research purposes has several advantages. Records are often comprehensive in covering the populations of participants, at least in public VET systems. They can produce a broad range of variables covering background information, such as equity category (for example, language background, disability, highest school level completed), demographic group (ethnicity, gender, age, state, regional location), and course enrolment type (provider, state, qualification level, field of study, enrolment type, course load). Compared with sample surveys, the level of detail and accuracy of data are important features. Using administrative data to examine non-completion, it is possible to gain quite detailed estimates disaggregated by provider-based classifications and certificate level as well as by broad participant group. Accepting the difficulties associated with definitions of non-completion, such analyses can tell us a lot about the size and broad dimensions of non-completion.

The survey should be comprehensive and part of an ongoing collection of information used regularly as an indicator of VET performance. Withdrawal or non-completion can be measured through administrative data. NCVER has developed a methodology to link a student's records across different years using a number of demographic and other variables. The method assigns a unique identification to each person and thus allows links to be made of an individual's enrolment records across years. The course code, which is unique to each course across all years, allows determination of whether a student is continuing in the same course or not. Using the matched records it is possible to analyse non-completion by tracing the enrolments and records of students over a defined period.

Several models already exist to measure non-completion. The approach of Foyster, Hon and Shah (2000) using data from the national provider collection was to estimate non-completion by tracking student enrolments over a three-year period, defining non-completers as those who had completed less than 95% of nominal course hours, who had failed at least one module of study they enrolled for in their course, and who had discontinued the course. The rates of non-completion could then be examined by a variety of course, enrolment and demographic factors. A second model is provided by the studies of completion and non-completion of degree courses in higher education. One approach has been to examine non-completion by estimating the proportion of those who commenced an undergraduate degree in a particular year, had not graduated three years later and were no longer enrolled. A similar approach could be applied to non-completion of qualifications in VET, adjusting for differences in the length of the course of study. This approach, however, would not take account of those who were only planning to complete a component of a course rather than a qualification.

The definition of non-completion is difficult in VET. Not all students who enrol in a VET course intend to complete the full qualification. Some undertake their study with a view to completing only some elements or modules of a course rather than the full qualification. This means that there are various groups of VET participants who have different intentions, and the notion of non-completion will vary depending on the group of participants. For this reason, one option in a survey of non-completion is to undertake analysis based on different definitions. Three possible groups are: (1) those who enrol and withdraw without completing any module; (2) those who may complete a module but fail at least one module and withdraw before completing a qualification; and (3) those who withdraw from their course without completing a qualification.

The third group is a measure of non-completion of a qualification rather than non-completion of VET study. It will include those who were only planning to complete some elements of a course rather than a full qualification and who therefore may be considered to have completed the study they originally intended to complete. For this reason, a second option would be to restrict the analysis of non-completion to the first two groups above: (1) those who enrol and withdraw

without completing any module; and (2) those who complete a module but fail at least one module and withdraw before completing a qualification.

It is important in a study of VET non-completion to examine those who do not complete all components of a course but were intending to do so. Part of the difficulty in identifying, measuring and examining patterns of non-completion is that there is no record of the initial intention. At present it is not possible to identify those who may have completed a module (or more than one) and did not complete the qualification they were enrolled in, but were intending to do so and therefore were, for all intents and purposes, non-completers. One way to overcome this limitation is to ask students at the point of enrolment their intention (to complete one or more modules or the whole qualification). This question is asked routinely at the point of enrolment in the United Kingdom. It permits authorities in that country to measure non-completion based on intention. The non-completion surveys in the United Kingdom define non-completion using this item of information.

Over time it will be necessary to better target the non-completers by gaining some measure of the intention for study. While it is still possible for students to change their intentions over time, the inclusion of an intentions question will provide a reasonable foundation for assessment of non-completion.

Irrespective of the definitional issues in surveys of non-completers, there are other limitations associated with using administrative data for examining non-completion. Some of these are due to inadequacies and complexities in the administrative data collections. Data systems do not allow simple and effective monitoring of participation and outcomes. Data cannot be related back easily to a relevant commencing 'cohort', since, for example, courses can be of varying lengths. It is therefore not a simple matter to estimate the proportion of commencing students at any given point who, in time, actually complete.

Outside the issue of the adequacy of administrative data, there is the important issue of what the surveys will provide information on. They will give estimates of non-completion across various courses, including by field of study, stream of study, length of course and type of enrolment. They will also provide information on the characteristics of non-completers—such as state, age, gender, urban or rural location, equity category. What they will not provide is any information on the behavioural factors leading to non-completion and the consequences of non-completion. Administrative data can tell us very little about the reasons for non-completion and the outcomes of non-completers. To get this information requires surveys of the non-completers themselves, surveys which attempt to establish the reasons for non-completion, the experiences of non-completers, and their outcomes. Such surveys do not need to be undertaken as regularly as those used to derive estimates of rates of non-completion using administrative data. However, they are important because they can provide valuable information on some of the underlying behavioural factors leading to withdrawal and non-completion of VET study.

Some options

Option one

One option is for the survey to be undertaken in conjunction with the Student Outcomes Survey. The current Student Outcomes Survey is an annual sample survey conducted to collect information about TAFE students who completed training in the previous year. Completers are defined as either graduates—those who completed the requirements for their course (AQF certificate I or higher) during the previous year—or module completers—those who successfully completed at least one module of VET study in the previous year but did not graduate. The graduates are those who were eligible for a certificate I–IV qualification, a diploma, advanced

diploma or higher qualification. Module completers are those who must have completed at least one module in the previous year and not be a graduate.

The non-completers survey could be undertaken at the same time as the Student Outcomes Survey, but would be augmented to include students who met the following criteria:

- ✧ those who were enrolled in a course in a TAFE institute in Australia two years previously and were not enrolled in the target year and had not successfully completed any module
- ✧ those who failed at least one module two years previously, had not completed a qualification, and were not enrolled in the target year
- ✧ those who had not completed all of the modules required to graduate for a qualification two years previously, and were not enrolled in the target year.

The scope of the survey would exclude those enrolled in short courses (recreational or hobby) and those with an overseas address. For all categories, questionnaire responses would allow identification of those who do not intend to re-enrol in the course they had commenced and therefore can be viewed as non-completers.

The first category can be viewed as module non-completers and more clearly identified as non-completers. They are the equivalents in non-completion terms of the module completers in the current Student Outcomes Survey.

The second and third categories of non-completers can be viewed as qualification non-completers. They are the non-completion equivalents of the graduates in the current Student Outcomes Survey. These categories may well include some students who are currently defined as module completers—those who successfully complete at least one module, are not graduates, are no longer enrolled, some of whom have also failed at least one module and some who have not. A question on intentions would help isolate the true non-completers in these groups. In the absence of this information, the target groups may well have to include some students currently identified as module completers.

In line with the methodology employed in the current Student Outcomes Survey, the data would be collected by self-answer questionnaire. The 2003 survey was conducted using a self-answer mailout questionnaire distributed to a stratified, randomly selected sample. The same sampling proportions would apply for non-completers and the same approach, using initial mailout and follow-up procedures with reminders. The survey would be undertaken with the support of state training authorities who would provide the details on the target sample members.

It is likely that the non-response would be greater for non-completers than for the graduates and module completers currently surveyed in the Student Outcomes Survey. This would be due in part to the larger time gap between enrolment and identification for inclusion in the survey (up to two years). Several procedures may be required to address this issue, including some of those used in the current Student Outcomes Survey:

- ✧ the use of an 1800 (free call) number to survey respondents
- ✧ an additional mail follow-up involving sending a duplicate questionnaire and brochure to respondents
- ✧ a telephone follow-up of non-respondents specifically targeting the non-response issue.

The bias introduced through non-response would need to be addressed through analysis of non-response and careful post-stratification weighting.

The purpose of the survey is to obtain information on non-completion that could not be obtained through an analysis of non-completion using administrative data. This means capturing information on reasons for non-completion, outcomes including labour market activities, and

information on course experiences. Survey data would need to collect information on personal background characteristics, including:

- ✧ training and employment background
- ✧ training characteristics including course name, qualification, field of education
- ✧ attendance, length of time taken to complete the training, main reason for doing training, reasons for non-completion
- ✧ views on the impact of non-completion
- ✧ satisfaction with various aspects of the course of study and training
- ✧ current employment, including whether employed full-time or part-time, casual or permanent, occupation, income, length of time taken to find a job after training and whether the job is their first full-time job.

Option two

A second option for the survey of non-completers would be to undertake it as a stand-alone survey periodically, say, for example, every three years. For inclusion in the survey, non-completers would be required to meet the same criteria as those defined above.

The survey could be undertaken in the same way as the Student Outcomes Survey, or alternatively, telephone interviewing could be employed to assist in increasing the response rate. Since the main purpose of the survey would be to obtain information on the reasons for non-completion and outcomes, a stratified random sampling procedure could be used with sampling fractions similar to those employed in the current Student Outcomes Survey.

Longitudinal survey of apprentices and trainees

Introduction

The main aim of a longitudinal survey of apprentices and trainees is to provide data on the backgrounds, progress and outcomes of apprentices and trainees in order to reach a better understanding of the long-term impact of contracted training on career paths and earnings.

A key concern with the relationship between vocational training and the labour market is that the apprenticeship and traineeship system is responsive to labour demand developments and that it produces an adequate supply of well-trained workers in a cost-effective and timely manner. Pressures on this relationship are generated if there is a high level of attrition, wastage of training, and/or poor outcomes for participants. Generating data on the activities, progress and outcomes of apprentices and trainees is therefore an important undertaking. It provides valuable information on how well the apprenticeship and traineeship system is meeting the needs of both the labour market and of participants.

Such data should permit such analyses as:

- types of certificates granted
- durations of programs
- characteristics of registrants (age, sex)
- comparison of the labour market activities by trade and state/territory of training
- factors associated with completion and discontinuation of training
- examination of the extent of geographic mobility during and after apprenticeship
- determination of relationships between apprenticeship trade and later occupations and earnings.

This sort of information is important in the context of concerns about the responsiveness of the apprenticeship and traineeship system to labour demand developments and how successfully it produces an adequate supply of well-trained workers. A longitudinal survey of apprentices and trainees is one way of gathering data on the effectiveness of the apprenticeship and traineeship system in meeting the needs of both the labour market and participants. It would also provide valuable information on the returns to apprenticeship and traineeship qualifications.

As with the non-completers survey, some of this information does not have to be collected from individuals themselves, but can be obtained through an analysis of administrative data. Using administrative data it is possible to gain quite detailed profiles of apprentices and trainees, including type of training certificate, training agreement, field of training, employment status, occupation and industry group, state, and student background (such as age, sex, and prior educational attainment). It is also possible to derive estimates of completion and withdrawal classified by age, sex, occupation group, qualification level, duration of training and prior

educational attainment. This type of information is currently published as part of the annual series of statistics on apprentices and trainees by NCVER (for example, NCVER 2004).

The profiling of apprentices and trainees using administrative data currently undertaken provides important information on issues such as completion and non-completion. However, it does not provide data on the behavioural factors associated with completion and withdrawal, nor on the impact of apprenticeships and traineeships on career paths and earnings. This requires longitudinal survey data.

Developing and undertaking a survey of apprentices and trainees raises sets of methodological issues that need to be examined. Before outlining some of these issues, it is worthwhile examining some studies of apprentices and trainees that have already been undertaken in Australia and overseas to identify methodological approaches they use. The following section will outline some of the methodological considerations in undertaking a longitudinal survey of apprentices and trainees in Australia. The final section presents the author's view on how to proceed with a longitudinal survey of apprentices and trainees in Australia.

Australian and overseas research

Australia

A number of surveys of apprentices and trainees have been undertaken in Australia, focusing on a range of issues, including completion and non-completion, access and participation, skill development and labour market outcomes.

An example of a longitudinal survey is provided by Cully, Vandenheuval and Goodes (2000). They used information collected from the Department of Education, Science and Training's Longitudinal Survey of Completing Trainees to examine skill development and labour market outcomes. The survey on which the analysis was based involved a sample of trainees who had commenced their traineeship in March 1996 and who had completed their training in 1997. The sample was selected from a centralised administrative database held by the Department of Education, Science and Training. The sample was stratified into three age groups (15–19 years, 20–24 years, and 25 years and over) and differential sampling fractions were used to ensure an adequate representation of older trainees.

The survey was conducted over two waves, the first in 1997, about nine months after completion of the traineeship, and the second in autumn 1998, a year after completion. It was conducted using computer-aided telephone interviewing. In the first wave of the survey, 2382 took part, and of these, 2098 also took part in the second wave.

Several studies have examined the issue of non-completion, mainly using longitudinal designs based on administrative data. The two major research studies of attrition in apprenticeships and traineeships commissioned by the then Department of Education, Training and Youth Affairs (Grey et al. 1999; Ray et al. 2000) acknowledge that there are significant difficulties in estimating attrition due to 'inadequacies and complexities in the administrative data collections' (Ray et al. 2000, p.4). Data systems do not allow simple and effective monitoring of participation and outcomes, and consequently the reported statistics are confined to commencements, in-training and completions data reported in raw numbers for each year or quarter (for example, in the NCVER *Australian apprentice and trainee statistics* series). However, completions data cannot be related back to a relevant commencing 'cohort' since apprenticeships and traineeships can be of varying lengths. It is therefore not possible to find systemic data sets that allow a simple calculation to be made of what proportion of commencing apprentices and trainees in any given point in time actually complete.

A further difficulty in monitoring activity is what researchers have noted as time lags between commencement of apprenticeships or traineeships and the electronic processing and recording of registrations. At times, these delays may be due to administrative or clerical error or systems malfunctions (Schofield 2000); at others, they relate to the lengthy process required by the legal framework for contract approval, as noted by the New South Wales Department of Education and Training (NCVER 2000).

A similar design to Grey et al. (1999) has been employed at state levels using state authority data. A Western Australian Department of Training and Employment research study using its own administrative data came up with findings which closely match those of Grey et al. (1999), concluding that the rates of attrition from traineeship programs in Western Australia in 1996 and 1997 were 39% (Western Australian Department of Training and Employment 1999). Queensland studies have also estimated non-completion using administrative data (Smith 1998).

A survey undertaken at the University of Melbourne by Walstab et al. (2001) used a longitudinal design to examine non-completion among school-leaving age apprentices and trainees. The cohort of apprentices and trainees on which the study was based was made up of 903 school completers in Victoria from the 1997 and 1998 school years. The cohort was somewhat different from the general population of apprentices and trainees. Noticeably, all had completed Year 12 and most had graduated from the VET in Schools program. The cohort was also different from graduates of VET in Schools programs in other states, where the concept of VET in Schools is in most cases quite different from the Victorian one.

A tracking exercise was undertaken to monitor the movement of school leavers through their period of training and into the workforce or other destinations, and to investigate labour market outcomes. Respondents were contacted and interviewed by telephone.

A further example of a longitudinal study in Australia is provided by the Longitudinal Surveys of Australian Youth. Information on completion, non-completion and labour market outcomes, including employment and earnings, has been derived using these data (for example, see Lamb, Long & Malley 1998). At first sight, the longitudinal survey has some attraction for evaluating apprenticeship and traineeship participation and outcomes. It covers a year-level-based cohort of young people with a large sample size (around 13 000 at wave 1), and so offers the possibility of defining more than one comparison group. It has a nationally representative sample that can be weighted to correct for non-response. There is a longitudinal structure, with a well-developed set of questions on economic activity, work-based training and post-school qualifications, enabling us to track progress through apprenticeships and traineeships and to identify entrants at different ages, and those who drop out from training. There is also a reasonable set of variables on home background, some school variables, and attitudes to education, work and training. Among the weaknesses of this survey, however, are its high levels of sample attrition across waves. Sample attrition can reach 7–8% annually, and given that apprenticeships can take up to four years to complete, this can lead to heavy attrition. On top of this is the issue that apprentices and trainees only make up a modest percentage of the original cohort, so that it is difficult to derive reliable estimates (of participation, completion, outcomes) across the range of apprenticeships and traineeships.

Another survey providing information on apprentices and trainees is the Labour Force Survey and its affiliated Survey of Education and Training conducted by the Australian Bureau of Statistics (ABS). The survey covers all people aged 16 or over, is cross-sectional in design, and can be used to compare people who undertake apprenticeships and traineeships with those doing other sorts of training (ABS 2004).

The Labour Force Survey has very good data on the two outcome variables in the evaluation, namely employment and earnings, but has only a limited set of variables that could be used to control for the effects of selection into training. These include age, sex, ethnicity, age of leaving

continuous full-time education, qualifications gained in school (proxied) and possibly health and disability. The main problem for evaluation purposes is the limited amount of historical data: there is information on qualifications, household circumstances and health/disability at the time of survey, but no information that can be securely dated to the period before entry to training.

England

A major source of data on apprentices and trainees in England is provided by the Individualised Learner Record, a national collection of data on learners in different programs, including apprenticeships and other work-based schemes (Learning Skills Council 2002). The administrative data in this collection include start date, employment status, expected duration of training, planned training occupation, level and subject of qualification sought, sector, and training provider. When the apprentice leaves, information is added relating to leaving date, date of transfer to employed status if applicable, immediate destination on leaving as far as this is known, and qualifications gained in training. There can be a lot of missing information on the last of these fields, as many trainees are not awarded their qualifications until after they have left. Administratively collected variables on background include date of birth, sex, whether the individual has a limiting health problem or disability, ethnicity, special training needs, previous participation, and whether in work.

Until 2001, information on outcomes was supplemented by data from a postal survey sent to trainees six months after leaving their training (Department for Education and Skills 2003). The survey asked for information on whether trainees had completed their training, usefulness of the training, their current activity and what qualifications they had gained. It included questions on whether the training was completed and agreed objectives met, views on the training, key skill units completed, details of current job (including earnings), relationship of their current job to the training received and training provided, and any qualifications now being sought.

Various surveys of apprentices and trainees have been conducted. An evaluation of Modern Apprenticeships in Wales in 2003, for example, was conducted using interviews with employers, interviews with providers and interviews with apprenticeship completers (Wiseman, Roe & Boothby 2003). There have been few longitudinal surveys of apprentices and trainees.

Canada

There are several collections of information related to apprentices in Canada.

Statistics Canada annually collects administrative information from the provinces and territories on registrants in their apprenticeship programs. Information is available on both in-class and on-the-job training for new registrants, continuers, completers and persons who withdrew. Analyses can be conducted with information on the types of certificates granted, duration of program, characteristics of registrants (age, sex) and more. The survey population includes all individuals registered with a province or territory taking apprenticeship training. Information is provided by registered apprenticeship administrators within provincial/territorial departments of education or labour. The survey uses administrative data, consisting of information for each individual registered in an apprenticeship program during the reporting year. Some data are reported in finer variable detail than other data, depending on the availability of the information from a particular province or territory.

On occasions, Statistics Canada also conducts surveys of apprentices and trainees. At times this body has conducted the National Apprenticeship Survey. The survey examines the additional education and training undertaken by individual apprenticeship registrants who completed or discontinued (without returning to complete) their apprenticeship training program. The survey

gives a detailed demographic and education/training profile of apprenticeship completers and discontinuers, and examines their subsequent labour market experiences.

In the last survey conducted in 1989, administrative records from the provinces and Employment and Immigration Canada were used to track completers and discontinuers of apprenticeship programs. Data collection took place in two rounds of telephone interviewing. The first collection took place in 1989, with an original sample size of 13 820. Due to a low response rate (37.6%), a second round of interviewing was carried out in the spring of 1990 bringing the total sample population to 23 220 people. From the sample of respondents who were screened in, the survey yielded a response rate of 97%.

A supplementary survey, the National Apprenticed Trades Survey, was also conducted. This special one-time survey was a continuation of the National Apprenticeship Survey. Data were collected by telephone interviews using computer-assisted telephone interviewing from a randomly selected sample of roughly 20 000 individuals. Individuals were surveyed approximately two years after leaving or completing the apprenticeship program. This provided more recent information on apprentices who completed or discontinued their apprenticeship program. Information from the National Apprenticed Trades Survey develops a profile of apprentices and allows such analyses as:

- ✧ comparing and contrasting the labour activities of completers and discontinuers
- ✧ examining the extent of geographic mobility after apprenticeship
- ✧ determining a relationship between apprenticeship trade and occupation two to three years after apprenticeship, including the effect of subsequent education and/or training, labour market activities by trade and province/territory of training and the factors associated with discontinuing an apprenticeship program.

The survey used the same sample as for the National Apprenticeship Survey.

Methodological issues

Design

It is important to determine whether a longitudinal study using cohort or panel data is needed, or whether a cross-sectional study with appropriate retrospective data would be more appropriate. A key issue here is the timing of the survey interviews relative to participation in training. In order to gain meaningful outcomes of apprenticeships and traineeships, sufficient time needs to have elapsed after completion or withdrawal. Against this, the greater the gap since leaving the course, the greater the problems of sample attrition in any survey.

Inevitably, the research design will need to balance these conflicting issues. In considering the design, the following issues need to be resolved. One relates to sample selection. At what point are apprentices and trainees sampled—entry, exit or some other time? Therefore, is the sample based on commencements (an entry cohort) or those participating at a particular point, irrespective of their enrolment date (cross-section)? If it is a sample based on commencements, then there is the issue of the use of a consistent entry date between sample groups; for example, between four-year indentured apprentices and those in 12-month programs, and for the timing of fieldwork to be consistent. There is a further consideration of breadth of participant groups to be surveyed. Should entrants of all ages and from all sectors be included in the sample?

Interviews among a single cohort would need to take place at regular intervals or at commencement, and then, in order to assess meaningful outcomes, at some date much later than completion or withdrawal. However, the longer the period needed between contacts, the higher

the likely sample attrition. This would also have implications for sample size in that numbers would need to be large enough to cope with sample attrition and retain reliable estimates of important subgroups. Sample size will depend in part on the questions that need to be addressed with the data and the extent of coverage. Will the samples need to be stratified? To derive estimates for different types of apprenticeships and traineeships, different types of training arrangements across states and different demographic groups, the samples will need to be stratified to enable valid and reliable estimates to be derived across the different groups and strata. If the samples are to be stratified, then the criteria of stratification need to be defined.

Any survey needs to obtain a reasonable response rate which may be difficult for apprentices and trainees, given sample attrition and the nature of the population concerned (more often young and mobile). Consideration needs to be given to what would be an acceptable attrition rate, the steps needed to minimise attrition and the sample size needed to maintain the integrity of the original strata design in a stratified sample.

Data collection methods

Face-to-face interviewing

Face-to-face interviewing is one option for the survey. An advantage of this method, at least according to some methodologists, is that it often provides the opportunity for collecting a greater volume of data and more detailed and complex information (for example, see Green & Krosnick 2001). As well as offering these advantages, a face-to-face method is generally preferable for long interviews. In addition, face-to-face fieldwork may help with the problem of sample attrition. However, this approach is likely to be expensive, particularly with a relatively large sample size. Costs could be contained by incorporating some clustering of addresses into the sampling process, although this depends on the number of cases which need to be sampled, the number available in the eligible sample frame, and the geographical distribution of these addresses. In general, fieldwork is more efficient with a clustered sample, but could introduce a sample bias in the results unless appropriately adjusted. An unclustered design has an impact on fieldwork costs, as this affects the amount of time interviewers spend travelling between addresses, in turn restricting the number of interviews that can be achieved per fieldwork shift.

Telephone interviewing

Telephone interviewing is an alternative to a face-to-face method of data collection. Generally speaking, telephone interviewing is more cost-effective and quicker to carry out. A potential disadvantage with telephone interviewing is the accuracy and currency of telephone details provided on enrolment databases. While large numbers of telephone numbers may be available on enrolment databases, it is likely that a proportion will be missing or incorrect. This is even more likely with non-completers whose details may be more out of date. It is possible to increase the proportion of up-to-date or accurate listings by using electronic telephone listings, such as electronic white pages, to match and add telephone numbers to names and addresses.

Mailout questionnaires

Mailout surveys are less expensive than telephone or face-to-face interviewing. Therefore, they can often facilitate the use of larger sample sizes. This can have associated benefits in terms of targeting larger numbers of respondents across sampling strata. The main disadvantage of a postal survey, however, is a likely lower response rate. Differential response rates across different groups of apprentices and trainees is also an issue.

Sampling and sample size

There are several sources of data for deriving samples of apprentices and trainees. One source is the administrative data collection on apprentices and trainees held by the Department of Education, Science and Training. Another source is the records of individual state and territory training authorities. Sampling is also possible through the National Apprentice and Trainee Collection maintained by NCVER. This provides a national database similar to the one maintained by the Department of Education, Science and Training.

If the aim is to provide estimates covering the various categories of apprentices and trainees and the different employment sectors and regions, the overall sample size that is needed is likely to be relatively large.

As discussed above, the survey may need to use a cohort of participants with a consistent start date. This may mean an 'annual' cohort, for example, from September of one year to August the following year. This would ensure that the sample covers a full representation of participants in terms of circumstances and entry routes, and would level out any seasonal variations in entry.

Maximising the response rate is essential to obtaining reliable data. Some previous longitudinal surveys have had low response rates. The difficulty of obtaining up-to-date addresses is often one of the main reasons for this. Mobility of certain groups is another.

Suggestions for a longitudinal survey of apprentices and trainees

A good working model for a longitudinal survey of the impact of apprenticeships and traineeships on occupations and earnings is provided by the Canadian National Apprenticed Trades Survey (Statistics Canada 1997). That survey is designed to collect information in order to compare and contrast the labour market activities of completers and non-completers, examining the relationship between apprenticeship training and occupation two to three years after apprenticeship, and the factors associated with discontinuing an apprenticeship program. The target population for the survey covers both completers and non-completers from a given period. Data are collected by telephone interviewing approximately two years after leaving or completing apprenticeship training. The sample is drawn from the national register of apprentices—the Registered Apprenticeship Information System, which is similar to the Australian national collection of statistics on contracts of training and apprentices and trainees.

Based on the Canadian model, the approach requires selection of a stratified randomly selected sample of apprentices and trainees for a given target year. In 2003, according to national figures on Australian apprentices and trainees, there were 117 800 completions and 122 700 withdrawals from apprenticeship and traineeship programs (NCVER 2004). If the survey sample were to be stratified by state/territory, age and sex, then to derive state and territory estimates with a confidence level of 95% and a 5% confidence interval would require an achieved sample of approximately 3200 completers and 3200 non-completers. This would be based on an individual state and territory sample size of 400 completers and 400 non-completers. These sample sizes would provide robust and reliable estimates at a national level. If further stratification were desired to disaggregate the sample by training package or qualification level, then larger sample sizes would be required.

Based on the response rates achieved in the Canadian study, and on previous examples in Australia (for example, Cully, Vandenheuvel & Goodes 2000), the selected sample sizes would need to be 4900 completers and 4900 non-completers to reach the achieved sample sizes. This assumes a 65% response rate achieved with a sample contacted by telephone. Telephone

interviewing using the computer-assisted telephone interviewing system is an appropriate method of data collection for the survey. It would be far less costly than face-to-face interviewing and likely to obtain much higher response rates than those obtained using a mailout survey. This approach would require the assistance of the state and territory training authorities to provide sample member details.

If the Canadian model were followed, the sample would be surveyed approximately two years after completion or withdrawal. This would permit analysis of data on the impact of apprenticeship and traineeship programs on labour market activity, occupation and earnings. Data could be collected relating to:

- ✧ training undertaken prior to the apprenticeship or traineeship and after (to help isolate the impact of the apprenticeship and traineeship training on outcomes)
- ✧ current employment status, income, employment and unemployment experiences between completion/withdrawal and time of survey
- ✧ views on the quality of the training received, and among the non-completers, reasons for withdrawal.

Information on prior educational and work history could be collected to examine the role of apprenticeships and traineeships in career paths.

Longer-term outcomes could be examined if the sample was contacted more than once. Experience with longitudinal surveys of young people suggests that the problems in longitudinal surveys are located mainly in establishing samples and between initial contact and the first follow-up. Attrition can be as low as 5–6% annually if appropriate methods of sample maintenance are implemented, such as obtaining alternative telephone contact details. To examine the longer-term impact of apprenticeships and traineeships on careers and earnings, the sample of completers and non-completers could be followed over time.

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National Centre for Vocational Education Research Ltd

Level 11, 33 King William Street
Adelaide SA 5000

PO Box 8288 Station Arcade
South Australia 5000

Phone +61 8 8230 8400
Fax +61 8 8212 3436
Email ncver@ncver.edu.au

www.ncver.edu.au