

“Playing the right tune in VET research”: Using cognitive interviewing to improve our instruments

Abstract

The importance of using research instruments that ask the ‘right’ questions is critical in VET research. This paper focuses on the process of developing survey questionnaires and highlights the issues involved in getting the ‘right’ questions. It is based on recent research, undertaking an NREC project that involved a national survey of private providers of vocational education and training. The process of cognitive interviewing (Willis 1999) – in particular, verbal probing techniques – was used to fine-tune the survey instrument before a pilot study was conducted to further ‘test’ the tool under actual survey conditions. This paper reports the outcomes of this process, with particular emphasis on the process of cognitive interviewing – how it worked in practice, the advantages and disadvantages of the process and the resultant impact the outcomes had on the final survey tool that was used to collect data for the main survey.

Introduction

Surveys are one of the most extensively used methods for collecting data in educational research (Cohen and Manion 1994, p. 83). Regardless of their scope (local, national or international), surveys encompass a range of data collection methods including structured and semi-structured interviews, and self-completion, electronic or postal questionnaires. They can include the use of standardised scales to measure particular constructs. Regardless of these variations, the process of survey design proceeds through a number of clearly defined stages (Cohen and Manion 1994, p.84), usually commencing with defining the objectives of the survey, operationalising key concepts, making decisions in relation to sample design and examining data analysis processes. One of the next steps in this process is the design of the instrument.

This paper reports on the process used to design an instrument which was administered as part of a NREC-funded research study to examine the activities of private training providers in Australia. The purpose of the survey was to gather data on private providers and their recognised training. The following research questions were used to frame the study:

- ✧ What are the characteristics of private providers delivering VET programs recognised under the Australian Quality Training Framework (AQTF)?
- ✧ What proportion of their activity is AQTF-recognised training? What else do they offer?
- ✧ What are the characteristics of this recognised training (e.g. fields of study, modes of delivery, AQF levels)?
- ✧ How many students undertake this recognised training?

The paper focuses on the processes used to develop and refine a questionnaire administered to a national sample of 330 private training providers. The prime concern was the development of a tool that would be relatively easy to administer via a structured telephone interview and designed in such a way as to be applicable to as wide a range of providers as possible. As part of this process, cognitive interviewing was used to guide the refinement of a draft of the questionnaire prior to the conduct of a pilot study.

The process of cognitive interviewing

Cognitive interviewing is a process that has been in use for almost 20 years. It is defined as ‘a process used to study the manner in which targeting audiences understand, mentally process and respond to the materials that we present’ (Willis 2005, p. 3). As such, it has wide application including the development of marketing campaigns, public education and so on. It has most extensively been used in the development of survey tools as well as the materials (such as the primary approach letter) that can accompany such an instrument.

The process of cognitive interviewing is usually conducted as one part of a sequence of activities (referred to by Willis as cognitive testing) used to prepare an instrument for use in data collection. The key features of this sequence are as indicated below.

Focus	The cognitive processes used by respondents to answer survey questions – comprehension, recall, decision making, judgments and response processes. The goal is to detect problems with the survey questions
Timing	Cognitive interviews are usually conducted after preliminary drafting and feedback on the instruments, and prior to further testing (for example, a pilot study)
Conduct	Cognitive interviews are conducted by trained interviewers working with a sample of volunteers drawn from the same population that will be used for the main study
Characteristics of the volunteers	The volunteers are usually selected so they represent the diverse range of characteristics that are of interest in the study
Processes used in the interviews	A range of verbal probing or ‘think aloud’ procedures (see below) are used with volunteers
Environment for the interviews	Interviews are usually conducted either in a context of the volunteer’s choice or in a location dedicated for this purpose (a ‘laboratory’ setting)
Sample size	Small numbers of interviews are usually conducted – numbers recommended in the literature vary from 5 – 15.

Source: Willis 2005, pp.6-7.

Two techniques are used in the cognitive interview. One is verbal probing, which entails the interviewer asking

...target questions... the subject answers it, but the interviewer then follows up (either immediately or at the end of the interview) by probing for other specific information relevant to the question or to the specific answers given (Willis 2005, p.47).

The other technique is the ‘think aloud’ protocol. This requires an interviewer to read aloud each question and then to record *verbatim* the subject’s verbalisation of their thinking as they respond (Willis 2005, p.43). This is a particularly valuable process when research questions are asking respondents to recollect when they last undertook a particular task or to quantify the number of times they might have undertaken a particular task (for example, the number of professional development courses they had completed in the past 12 months).

Verbal probing rests on three assumptions. First, the way in which a particular question is designed will have an impact on the cognitive processes used by a respondent to develop an answer. Secondly, we assume that we are able to examine (‘probe’) the processing undertaken by a respondent to answer a particular question as a way of tapping sub-processes such as comprehension, retrieval of information. Thirdly, we assume that the information we receive from the respondent is useful in that it provides a basis for judging ‘whether the question has been processed as intended’ (Willis 2005, p. 50).

It is important to note that cognitive interviewing does not ‘validate’ instruments *per se*. Its value lies in providing a systematic way of ‘inspecting’ survey tools and providing

information about potential problems which can arise during data collection. This information can then be used as a basis for making decisions about revisions to the tools prior to further testing and conduct of the data collection process.

Using cognitive interviewing in practice – a case study

The process of developing the instrument to be administered via a telephone interview with the private providers consisted of a number of related steps. In the first instance, initial drafts of the instrument and the primary approach letter were devised (see Attachment). These were then distributed to members of the Project Advisory Group for feedback. Feedback was also received via the External Reviewer's Report and from the initial application to the Statistical Clearing House (SCH) of the Australian Bureau of Statistics.

Based on the procedures outlined by Willis (1999), a cognitive interview protocol was designed. The protocol relied on the use of verbal probes to test both the primary approach letter as well as the content of the instrument. The cognitive interviews, each of just over an hour, were then conducted with three private training providers. The focus was on the cognitive processes that respondents use to answer the questions rather than on the results received.

Respondents were first questioned about the primary approach letter. The purpose of this letter was to introduce the survey to persons within the private training organisation. It outlined the reasons for the survey, details of the timing of the survey and the nature of the information being sought. Additionally details about how best to prepare for the survey, a guarantee of confidentiality and information about how the data would be used and stored were also included.

During the cognitive interview, respondents were asked a series of questions about this letter including:

- If a letter like this came into your organisation, who would get it?
- Would they be the person that would be able to provide the answers to the questions?
- If no, who would they pass it onto?
- How might the wording in the letter be changed to ensure that it gets to the person who would be able to provide this information when the telephone interviewer calls?
- Who in your organisation is the person most likely to be able to supply the answers to the questions?
- In relation to the dot points seeking information – are there any that you are not sure what they mean?
- Are annual reports the place where a person would look for the sort of information that is required for the interview? If no, where would people look?
- How long do you think it would take a person in your organisation to assemble the information listed in the letter and have it ready for the telephone interview?
- Is there anything in the information letter that you were not sure about?

Attention then turned to the tool itself. Respondents were asked a series of questions about each item. Depending on the content of each particular item, these included questions which:

- probed respondents' understanding of key terms (for example Question 2 – 'What does the term "non-government sources" mean to you?' or Question 7 - 'What do you understand by the term "higher education institution"?')

- examined how easy or difficult respondents found particular questions (for example, Question 3 - ‘Is it hard to think of the main reason?’ followed by ‘How much have you thought about the reasons why your organisation is registered to provide nationally accredited training?’ or Questions 5 and 6 ‘How difficult would it be for you to answer these questions?’)
- probed the certainty of respondents’ answers (for example – Question 8 – ‘In your own words, what is this question asking?’ followed by ‘How sure would you be of your answer?’), and
- ascertained the ways in which respondents came to their answer (for example, Question 16 – ‘How would you get the answer to this question?’ followed by ‘How sure would you be of your answer?’).

Outcomes of the process

In its initial form, the primary approach letter was most likely to go to the administration area of larger organisations where a decision would need to be made about whom to redirect it to for completion. It was suggested that the letter be addressed to a senior officer in the organisation such as the Director, Chief Executive, Managing Director, Senior Manager, Owner, a person possibly involved in decision-making within the organisation who would have access to the information required to answer the questions.

In relation to the dot points seeking information, two comments related to:

- some ambiguity about interpreting the question on ways in which their organisation provides training
- concerns about how to categorise the numbers of students enrolled in the different national qualifications.

In order to complete the instrument, subjects believed that various records in the organisation would need to be accessed. Annual reports were seen as one possible source but many private providers are private companies and do not produce an annual report. Similarly it was thought that much of the required information would not often be found in an annual report. As a result, answers would need to be sourced from various areas within the organisation such as student records, payroll records and reports to state training authorities. Subjects also agreed that some questions focused on areas which are not likely to be reported on by private providers in the general course of business and required answers that could only reasonably be made by a person with a sound understanding of the organisation, its operations and client base. Estimations of the time required to assemble the information required to answer the instrument varied from 30 minutes to an hour. In larger organisations, it was thought that information would be requested from the different sections of the organisation and a couple of days allowed for it to be assembled. As a result of this information, minor wording changes were made to the letter.

The table below summarises the information provided by respondents for each question in the survey instrument and the decisions that were made on the basis of this information.

Question number and focus	Information from cognitive interviews	Decision made
1. Are you currently registered as a training organisation that is able to deliver nationally accredited vocational education and training?	Subjects were able to understand the question	No modifications needed
2. Is your organisation also registered as? (a) higher education institution? (b) school?	Subjects were able to understand the question	No modifications needed
3. What is the main reason for your organisation being registered as a training organisation that is able to deliver nationally accredited vocational education and training?	Subjects who had given the question some previous thought were able to recall a main reason and select a suitable response was selected. In cases where subjects had not thought about the reasons prior to reading the question, they were faced with the task of first thinking about the reasons why their organisation had become registered, selecting the main one and matching that with the response sets offered. They invariably came up with a range of reasons and found it difficult to identify one of these as the main reason	Question discarded
4. Which one of the following descriptions best fits your organisation: adult/community provider? enterprise-based org.? industry org.? commercial training org.?	Subjects from organisations which are commercially driven and have clear business objectives found it easy to pick one description. However, this proved more difficult for others. The main problem was uncertainty about the meaning of the other categories.	Question revised to include definitions of each option
5. Approximately how many Australian students [that is, excluding those who are studying here on a student visa] were enrolled with your organisation in 2003? 6. Approximately how many of these Australian students were enrolled in: nationally accredited and non-accredited programs?	Subjects were unsure of what information question 5 sought in terms of dates and student status (full-time, part-time); definition of Australian students confusing	The term 'approximately' was removed from both questions and others. The term 'Australian students' was redefined. The subcategories of part-time and full-time were added to question relating to the number of students.
7. In the nationally-accredited programs, approximately how many students were in programs funded by: (a) government sources? (b) non-government sources?	Subjects reported that they struggled with the meaning of key terms in this question	Terms were clarified. Word 'approximately' was removed. Term 'Australian students' added. Additional category of 'self-funded' was added.
8. In which States/Territories did your organisation deliver nationally accredited training in 2003? Indicate which location had the most activity.	Subjects had no difficulty understanding this question and were either 'very' or 'quite' sure of their answers.	No modifications needed

Question number and focus	Information from cognitive interviews	Decision made
9. For which three main industries (or occupations) did your organisation provide nationally accredited training in 2003? (categories given)	Subjects had varying opinions about the difficulty of answering this question – some were confident, others did not recognise the categories as being applicable to their organisation	Question revised - 'fields of study' categories used instead.
10. Approximately how many students were <u>enrolled</u> in each of the following types of national qualifications with your organisation in 2003? (AQF levels given) 11. Approximately how many students <u>completed</u> each of the following types of qualifications with your organisation in 2003? (AQF levels given)	No-one had difficulty understanding the questions as posed. However, subjects experienced varying degrees of difficulty in answering these questions for a range of reasons, including nature of record-keeping used by organisation, nature of client groups (e.g. school students)	Question 10 deleted. Question 11 revised to include a reference to 'Australian' student. Removed the term 'approximately'. Reference to high school qualifications was removed from the list
12. How is training and assessment for nationally accredited programs provided by your organisation? (different categories given)	Subjects understood the question, but found categories confusing.	Reference to mixed mode delivery was removed. Term 'computer assisted' was amended. Term 'distance education' defined.
13. In your opinion, what is the <u>main reason</u> why students choose to do nationally accredited training with your organisation? (possible reasons given)	The difficulties associated with answering this question related to the need for the subject to make a judgement about the main reason – most felt answer would be anecdotal.	Question was discarded.
14. Did your organisation offer nationally accredited programs <u>off-shore</u> in 2003?	Use of word 'offer' was thought to be confusing	Question amended to read: 'Did your organisation deliver nationally accredited programs off-shore in 2003?'
15. What were the approx. numbers of full-time, part-time and casual staff employed in your organisation in 2003?	Some uncertainty about which staff the question refers to. Issues were raised in relation to the sensitivity of this information, the difficulty in giving accurate data unless a specific timeframe was provided.	Question revised to ask for details of staff members directly involved in training.
16. Which of the following services were provided by your staff in 2003? (a list given)	Some subjects found this question difficult to answer because they had problems with understanding the question and some of the terms used. Also, not confident of their answers.	Question was discarded.
17. What services does your organisation provide for students who are completing nationally accredited training with your organisation? (a list given)	All subjects believed that this is basic knowledge which they possess due to their position in the organisation and all were very sure of their answer.	No modifications needed.
18. How strong are the following factors as either <u>promoters</u> or <u>inhibitors</u> of growth in your registered training organisation?	Terms were understood; subjects were reasonably sure of their answers, though each qualified this by saying that it is personal opinion.	No modifications needed.

The information gleaned from the cognitive interviews proved invaluable. It provided insights into the ways in which potential respondents might understand key concepts being explored in the survey. It revealed that often apparently quite simple terms can be interpreted in a number of ways and therefore need to be defined carefully if meaningful responses are to be collected. The process also provided the researchers with different ways of expressing key concepts that were more understandable to the respondents. In short, it provided a way to step into the shoes of a potential respondent and see the world from their point of view. It was not always possible to reconcile the differing perspectives offered by the respondents and ultimately some judgements were needed by the researchers in relation to the final decisions to keep, modify or discard a question.

The process revealed a significant number of issues with the draft set of questions for the survey. The use of probing required the researchers to consider many different aspects of each question (is it understandable? what do respondents have to do in order to answer the question? etc.). Cognitive interviewing invites careful scrutiny of the exact nature of any problems (for example, is it just the wording of the question that is the issue, or is it that the answers are not attainable with any degree of accuracy or certainty?). This close scrutiny is more likely to result in the need for changes to questions.

While the process was successful, it nonetheless had some drawbacks. The process of conducting cognitive interviews is time consuming and has the potential to add significantly to the development costs for a survey. It also requires significant efforts in training interviewers. Finding respondents prepared to participate in this very detailed process, while not difficult, did require some additional work. There are also potential issues with the number of cognitive interviews that might be conducted. In this instance, three interviews were used – arguably perhaps too small a number given the diversity that is known to exist across private training providers.

Conclusions

The decision to use cognitive interviewing to develop the survey tool for our research with private training providers paid great dividends. The time taken to complete the interviews with respondents was reduced as far as possible, thus containing the costs associated with data collection. There were few if any reported incidents of respondents not understanding questions in the main study and the addition of detailed definitions of key terms in ways that were most meaningful for potential respondents provided the interviewers with additional information when clarification was needed.

The process of cognitive interviewing was also helpful in the process of negotiating permission to conduct the study with the Statistical Clearing House. Comprehensive information on each question to be included in the survey, including a rationale for the wording of each question, was able to be provided. Additionally, each question was also able to be justified on the basis that it would be able to provide the data needed to answer the research questions for the study. Refinement of the primary approach letter provided the Statistical Clearing House with greater assurances that the survey had a greater likelihood of reaching the person most able to provide the required information. The outcomes of the cognitive interviewing process, coupled with the pilot study which was able to provide detailed information on the response burden on respondents, provided a sound basis upon which judgements could be made about the likelihood of the research being able to attain its stated outcomes. In short, this process made us feel more confident than we would otherwise have been that we were ‘playing the right tune’ in our research.

References

- Cohen, L & Manion, L 1994, *Research methods in education*, Routledge, London.
- Willis, G 1999, *Cognitive interviewing. A "how to" guide*, short course presented at the 1999 meeting of the American Statistical Association, viewed 15 December 2005, <http://www.appliedresearch.cancer.gov/areas/cognitive/interview.pdf>
- Willis, G 2005, *Cognitive interviewing*, Sage Publications, London.