

RESEARCH AND DEVELOPMENT ISSUES FOR VOCATIONAL EDUCATION AND TRAINING IN AUSTRALIA

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A government-funded project to develop a national research and development strategy for vocational education and training has recently been conducted in Australia. This paper describes some issues that arose in the course of the project, carried out for a Working Party of the Vocational Education, Employment and Training Advisory Committee.

The background

Research and development in vocational education and training in Australia has spanned a remarkably diverse range of agencies, subject disciplines and research methodologies. This diversity is both a strength and a weakness – a strength because a wide and rich range of perspectives are obtained on the issues and problems facing vocational education and training practitioners and policy makers, and a weakness because there is little dialogue between researchers across subject disciplines and few cases of multidisciplinary investigation of the major issues requiring research in vocational education and training.

The main agencies conducting research and development in vocational education and training in Australia are:

- State and Territory vocational education and training authorities, and TAFE colleges;
- the Department of Employment, Education and Training (DEET);
- National Centre for Vocational Education Research (NCVER);
- universities;
- Industry Training Advisory Boards;
- private foundations and consultants.

and, to a lesser extent:

- some large private corporations and government departments;
- and

- employer and union bodies.

For many years most vocational education and training research was undertaken by researchers in state and territory TAFE authorities. Much research and development is still undertaken by these agencies, but an increasing proportion is being undertaken by a range of other organisations.

Of particular significance is the establishment of the TAFE National Centre for Research and Development in 1981 (now named the National Centre for Vocational Education Research). A decade ago people understood the need for a national focus for vocational education research. This resulted in the establishment of the Centre in 1981, and since then it has steadily expanded and developed its research and dissemination work. A remarkable feature of the establishment and funding of the Centre is the cooperation of the state, territory and commonwealth governments that is displayed.

In a sense, the Centre has been ahead of its time in that it has changed some of its focus from publicly funded vocational education to issues well beyond that, a move that has now been confirmed by its change of name.

Another significant development is the relatively recent increasing research activity in vocational education and training in some of the new universities. Academics in these universities are being encouraged to undertake research. The vocational education and training schools and departments are mostly located in these newer universities.

Most of the vocational education and training researchers come from the fields of education or vocational education and training. However, there are a few vocational education and training researchers from the fields of economics, industrial relations and business studies, and researchers in these related fields sometimes undertake vocational education and training research projects.

There is diversity, perhaps more than in any other field, in the disciplinary origins of vocational education and training

researchers, which include: psychology; sociology; economics; labour markets; industrial relations; physical sciences; philosophy; and history. Consequently, there is diversity in the range of research methods being used, reflecting in part the disciplines involved. Vocational education and training research uses the full range of methods of the conceptual and empirical (both qualitative and quantitative) types.

Research into vocational education and training has in some ways reflected some of the problems of vocational education and training itself. For example, vocational education has never really been accepted as part of the education profession or as part of the economic and labour market profession, and vocational teachers and trainers are less part of the general education

profession than others. Research problems arise partly from these issues, as well as the problem generally of vocational education and training generally having less 'kudos' attached to it, a problem that carries over into research.

Origins and aim of this project

The need for a national strategy for vocational education and training research and development was identified in the 1991 review of the TAFE National Centre for Research and Development. In 1991 the Vocational Education, Employment and Training Advisory Committee (VEETAC) established a National Research Strategy Working Party. The Working Party developed terms of reference for a consultancy and called for tenders in late 1991. In March 1992 the University of Technology (UTS) was selected to undertake the consultancy to develop a national research and development strategy, and Peter Kearns and Associates was commissioned to prepare a paper on overseas strategies and perspectives.

The terms of reference for the project are given in Appendix A. The overall aim of the project is to develop a national research strategy for vocational education and training. This involved:

- i. identifying the relevant issues, including the scope and purpose of the strategy, research themes for the next five years, research priorities for the next triennium, funding requirements and research requirements for public policy;
- ii. determining current research and development activities and infrastructure;
- iii. developing appropriate strategies to achieve the necessary research and development capacity and quality;
- iv. identifying appropriate dissemination mechanisms and a review process for the strategy.

Processes used in the project

The research team used a range of data collection methods for the project, and involved a wide range of organisations and individuals. As illustrated in Figure 1.1, the processes involved five primary research techniques:

- literature research;
- search conference;
- submissions;
- interviews;
- group consultations.

Figure 1.1 Flow chart of project

Literature research

The literature research involved review and analysis of the literature on vocational education and training research published in Australia. Comparisons with overseas literature and educational research literature were made. Reports and papers relevant to the issues covered in this project were collected and reviewed.

Search conference

The aim of the search conference was to bring together the various audiences and stakeholders – practitioners, policy makers and researchers – to identify research priorities and develop

strategies for the conduct and dissemination of research and development. The conference was held on 20 and 21 May 1992 in Sydney, and involved 27 people.

Submissions

A call for submissions was made in the national press and by personal letter to major stakeholders, both organisations and individuals. A total of 72 submissions were received from a wide range of organisations and individuals in all states and territories.

Interviews and group consultations

A total of 74 interviews were held with key stakeholders in all States and Territories – both individual interviews and group discussions – and including the Board of the National Centre for Vocational Education Research. Although there was an intention to keep an appropriate balance between interest groups, the many requests and opportunities provided for comment by small employers and employer organisations resulted in few contributions.

Workshop/conference

A workshop/conference 'Training Research in Higher Education' was jointly organised by the National Centre for Vocational Education Research and the University of Technology, Sydney in Sydney on 16 and 17 July, 1992. It was attended by a representative cross-section of about 40 vocational education and training researchers in universities and TAFE, as well as senior TAFE and DEET staff. Although the workshop was not an official part of this project, most of the issues discussed were relevant to the national research strategy, and therefore the workshop contributed much to the development of ideas for the proposed strategy.

Definitions

In producing the report, we have had to make some arbitrary definitions of both 'vocational education and training', 'research', and 'development', mainly to define the boundaries within which the report would be written.

a. 'Vocational education and training'

There is some disagreement about the meaning of the term 'vocational education'; to avoid misunderstanding, we have adopted the use of the term as most commonly used and understood. Vocational education, for the purpose of this project, is defined as all formal post-school education which prepares students for (or further develops their skills in) a specific vocation or for work generally, up to and including the level of paraprofessional occupations. Training has been taken to include both on-the-job and off-the-job training to a similar level.

The figure below, originally designed for human resource development, covers many of the fields which contribute to vocational education and training.

Figure 1.2A pictorial view of human resource development
b. 'Research and development'

We have been struck throughout the project by the different ways in which people responded when asked what research and development was needed. Responses focussed on gaps in our knowledge, on a need for evaluation of the large number of initiatives taking place at present, on the need for more directed research on curriculum issues, on the lack of data on which to base decisions, and on the pressing need for wider dissemination of research findings.

It is critically important, at this stage in the evolution of research in vocational education and training, that all parties take an eclectic and pragmatic view of the meaning of the term 'research'. For the above reasons we have adopted the broadest possible definition of 'research': we include under this heading all conceptual or empirical investigations which contribute to our knowledge about vocational education and training and the factors that are directly relevant to it, no matter how this knowledge is obtained, and the non-routine application of this knowledge. For example, the routine use of the DACUM technique

to obtain specific information about a particular occupation or course would not be classified as research under this definition, whereas an innovative application of DACUM which leads to new knowledge or insights on the research process would be classified as research.

On the other hand, 'development' projects take new knowledge obtained from research and/or other existing ideas and develop this into products or procedures that are readily used in the practice of vocational education and training. Often in vocational education and training it is hard to distinguish research from development and this issue is discussed in section 1.5.

Categories of research and development

To help us discuss the different types of research and development, we classify R&D under the following headings.

Applied research

Applied research is categorised as either 'general issues based' or 'client-specific'. Although there is sometimes some overlap it is useful to discuss them separately.

General issues-based applied research:

This type of research aims to provide principles or models that give an understanding of vocational education and training beyond specific contexts and results in research findings that have direct applications to educational policy and practice. The

findings could come from a single study or, more commonly, from a several similar studies conducted in a variety of settings.

Client-specific research ('internal research'):

Client-specific research, or internal research, aims to provide answers to a particular problem or provide understanding of vocational education and training in a specific context. It is carried out by TAFE systems, industry bodies, employers and unions for their own purposes, with little generalisability beyond the immediate context. Most current research in vocational education and training would be classified as client-specific research or development.

The scale of such research varies considerably. At one extreme is the large-scale level, in which resources outside the client organisation are normally used and considerable resources are expended in finding a solution. In vocational education and training this approach is commonly used by policy makers when consultants or academics are commissioned to research particular issues or problems. As discussed in Chapter 3, research commissioned for this purpose accounts for the largest amount of vocational education and training research in Australia.

At the other extreme, small scale investigations are carried out and outside resources are infrequently sought. This approach is used by individuals or small groups of practitioners in vocational education and training, and when the research is associated with changes in practice it is often called 'action research'.

Fundamental research

Fundamental research covers the formation of principles, broad conceptions and models that provide a basis for an understanding of vocational education and training; this is sometimes described as 'knowledge for understanding'. Although often of less obvious relevance to immediate issues, the results of good fundamental research are still available, and relevant, long after much applied research has ceased to have much meaning.

Development

As mentioned in the previous section, development leads to production of new products or procedures that are readily used in the practice of vocational education and training. It often builds on, and is closely related to, client-specific research. It is apparent that many projects in vocational education and training combine research with development. Client-specific research is usually carried out early in a project to provide a foundation for the development of a product or procedure. This means it is often difficult to distinguish applied research from development in vocational education and training.

Of these types of research, we have found that large scale client-specific research and development projects account for the bulk of research funding in vocational education and training in Australia.

The proposed strategies include all these categories of research.

Development projects which include an element of client-specific research also form part of this strategy. In this context, all references to a research strategy in this report should be understood to include this type of development project as well.

Current research expenditure

Only about half as much is spent on research in vocational education and training (as a proportion of recurrent expenditure) as is spent on research in the other sub-fields of education.

Vocational education and training compared to the whole of education and training (a) recurrent expenditure (b) research expenditure

This figure provides an estimate of the amount of money spent by governments on research in vocational education and training in Australia, compared with the amount spent on research in the whole education field. This figure excludes expenditure on development projects, research funded by other non-government agencies, unfunded research, and administration of research funds.

Nearly all of the funding is for problem-oriented commissioned research, and very little funding is directed to general issues based research or fundamental research in vocational education and training. Most resources are, in fact, allocated to development projects, particularly curriculum development at national, state or local level.

Furthermore, the proportion of total funding allocated to research is extremely small. The figure below shows research expenditure as a percentage of total recurrent expenditure in vocational education and training. The Strategic Review of Research in Education stated that education research expenditure, as a percentage of recurrent expenditure, is considerably lower than other fields. By comparison, the research percentage for vocational education and training is even lower at 0.22%. This suggests that the current level of expenditure on research in vocational education is low relative to education generally, and very low relative to research expenditure in other fields. This could be expected given the low status of the sector compared to education and other fields.

Research expenditure on vocational education and training as a percentage of recurrent expenditure

Current research output

In order to classify the field of vocational education and training it was first necessary to design a classification system which was appropriate. The classification scheme is as shown below.

Classification scheme for vocational education and training

Policy and Economics

(Includes government and industry policy; economic and financial issues; labour market issues;...)

Organisation

(includes vocational education and training systems and structures; level of provision; accreditation of courses; credit transfer arrangements; recognition of prior learning; management /administration of vocational education and training; links between different sectors of education; facilities, buildings and equipment; overall quality issues;...)

Industry Issues

(Includes needs analysis, skills audits and skills analysis; workplace literacy and numeracy; links between industry and TAFE, schools and universities; awards; links between training and productivity, industry skill trends,...)

Students and Trainees

(Includes who is being trained for what; career paths; unemployment; occupational identity; general access issues; women's access; access of disadvantaged groups;...)

Teachers and Trainers

(Includes the vocational education and training profession; competency standards for trainers and teachers; career paths for trainers and teachers; trainer and teacher education;...)

Curriculum Development and Delivery

(Includes teaching/learning issues; workplace learning;

assessment; competency based training and assessment; modes of delivery; evaluation of courses; educational and training psychology; training needs due to industry restructuring;...)

Research methods

(Includes methodologies for research in and evaluation of vocational education and training; comparative studies; data bases; implementation of research findings;...)

One indication of the quantity of research in vocational education and training is the number of research -based articles and publications entered into the Australian Education Index (AEI). The figure below shows the number of vocational education and training research articles in each of seven major subject categories, and compares this with the number of education articles (broadly covering training, vocational education, higher education and school education), entered into AEI since 1979. In total there were 974 vocational education and training research articles found in the database, which is 10% of the total number of research articles in education overall.

Research articles in AEI database since 1979

Shortcomings in Australia's current research

Information collected in the search conference, the interviews and the submissions indicates that there is a consensus on the perceived shortcomings of vocational education and training research in Australia. These are that:

- a. current research is fragmented;

- b. there is little fundamental and general issues based research in vocational education and training;
- c. the big issues in vocational education and training need much more intensive research;
- d. a strong critique of vocational education and training policies and programs is absent.

a. Fragmentation of current research

Current research is seen as too thinly spread over a wide range of topics, with many important issues being under-researched or not researched at all. This perception is supported by an analysis of the research literature in vocational education and training published 1987 to 1992; most research topics had five or less publications in the AEI and VOCED databases.

The analysis of the research literature also shows that few Australian researchers are researching each topic. In most of the areas of research seen as important, the number of researchers is seen as below the critical mass needed to make significant progress. Another feature of Australia's current vocational education and training research effort is the high proportion of researchers who research a wide range of topics over time. One likely reason for this is the high proportion of commissioned research in vocational education and training. Researchers are being funded to do research in issues or topics selected by the major commissioning bodies, and the issues or topics tend to be relevant to the commissioning organisation's short term information needs, which are prone to change from year to year.

A feature of Australia's current research effort in vocational education and training which contributes to fragmentation is the geographical spread of researchers and their location in a diverse group of organisational types. The communication between and within these groups of researchers is generally thought by those involved to be poor. There are a number of formal and informal networks of researchers in related organisations, but no single comprehensive network of researchers in vocational education and training. Furthermore, the networks that do exist are mostly within one or two of the organisation types listed above.

A variety of strategies for reducing the fragmentation of research in vocational education and training was suggested in

the project. These ideas included:

- setting national priorities for vocational education and training research;
- a larger pool of funding for general issues-based and fundamental research in vocational education and training, as well as commissioned research;
- coordination of Australia's research effort, including the establishment of a research consortium;

- improved communication between researchers.
- Each of these is discussed elsewhere in this report.
- b. Relatively little fundamental and general issues based research

People perceive that there is relatively little of the more fundamental and general issues based research (that is, research that builds theories or general understandings of issues that are applicable to a wide range of contexts) on vocational education and training conducted in Australia, and this is supported by statistical data (see Appendix C).

The research that is conducted is fragmented, and little of it receives funding. Some saw the need to reapply the outcomes of good research conducted in the past to current issues of concern, which will often require the adaptation of terms into today's language. Also, some fundamental research in other fields and disciplines may be applied to vocational education and training concerns.

The ARC was seen as an appropriate agent, for funding this type of research. However, a greater amount of fundamental research in vocational education and training should be supported by nominating vocational education and training as a priority area. This issue is discussed further in Chapter 4.

c. Concentrating on the 'big' issues

There was also agreement on the need to focus research resources on the 'big' issues in vocational education and training.

Examples of 'big' issues that were cited include

- the economic benefits of vocational education and training,
- the relationship between workplace training and productivity
- workplace changes and their effect on vocational education and training,
- the value of competency based training
- learning processes
- assessment of competency and key competencies.

This need is not unique to Australia. The following statement appears in a recent British book:

"With the imminent wide scale introduction of National Vocational Qualifications ... one might have surmised that Competency Based Learning would have assumed a prominent and important focus for research and debate in British universities. This is not the case ... Whilst there are isolated examples of CBL research undertaken by academics in some universities, this work appears to have had very little impact on outside publics."

Some expressed the view that to make significant progress in many of these issues, strong multidisciplinary teams of researchers should be established, including researchers from the disciplines of economics and industrial relations. Such multidisciplinary teams are not present in the present research effort, and

strategies to establish such teams are discussed in Chapter 4.

d. The lack of a strong critique of policies and programs
Another shortcoming is the lack of a strong critique of vocational education and training policies and programs in Australia. When the Green and White papers into the structure of Australia's higher education system were released in the late 1980s, there was a flood of articles and critique examining the proposed changes and in many cases attacking them. By comparison, the massive changes in vocational education and training over the last few years have attracted very little discussion or comment. If the changes to the sector are to be beneficial and long-lasting, there will be a need for an national debate, informed by research and theoretical perspectives, on the issues involved – no matter how uncomfortable this might be for some involved in policy formulation from time to time. The need for such a critique was seen by a wide range of people, including senior government officials, TAFE policymakers, practitioners and researchers.

The need for a strategic approach

a. Why do we need a research strategy?

Apart from the actual lack of research one widely-expressed criticism is that the research into vocational education and

training is too fragmented: it is spread thinly over a range of topics, with many important issues being under-researched or not researched at all. (One of the reasons for this is that there are almost no important research areas in which there are sufficient researchers to form a critical mass.) As a result, the research that is carried out results either from individuals' interests or from needs of particular TAFE systems, or government or industry bodies at a certain moment. What is lacking is the planning of research in the context of national needs, for both decision-making and for the development that will need to take place to support all new directions.

If resources are to be allocated to research in vocational education and training, the establishment of a strategic plan for research (and the development and dissemination of its results) will increase the likelihood of such research being well-focussed and implemented.

There is widespread support for this approach, which is seen, sensibly implemented, as giving a sense of purpose and accountability to research, ensuring that it has an impact, and sending signals to current and future researchers in this area. The use of strategic plans for research and development has been particularly successful in some agricultural industries, both in Australia and overseas, and is given as one of the two main reasons why research is valued by practitioners.

Setting priorities

There are three issues concerned with the setting of priorities

that require further comment:

- the case for setting priorities;
- the criteria for setting priorities and for how long they should last;
- what are the current research priorities in vocational education and training?;

The case for setting priorities

During the consultations involved in this project, none of the interviewees or submissions expressed any doubt about the need to set priorities for vocational education and training research. Nevertheless there was a concern that the priorities needed to take into account the fact that there were many stakeholders who might have differing views about what these priorities might be. We feel that there should be the opportunity for researchers to contribute to the setting of priorities, and the setting aside of a percentage of the total budget for researcher-initiated projects which may fall outside the existing priorities but which may influence them. Thus the setting of priorities is not incompatible with researchers being able to undertake research of their own choosing and which may on occasions be critical of current policies. This is particularly the case since we are recommending a pluralistic funding policy, in which research and development can be funded from various sources.

Criteria for determining priorities

The single most important criterion voiced by participants in the project was related to the short term imperatives imposed by the changing vocational education and training agenda. That is, the fact that directions have been embarked upon which lead to enormous changes in vocational education and training has meant that prior research, which should have been essential, has been missing. Such research could provide sound guidance on both the assumptions underpinning these changes and effective ways of implementing them. Another way to describe this criterion is in terms of the research gaps which currently exist.

Given the current circumstances, we agree with this criteria but at the same recognise that other criteria exist which might guide research both in the medium and longer term. The urgency of upgrading the national skill base would normally be only one criterion that could guide the setting of priorities and which might lead to a number of priorities. But in the case of

vocational education and training this urgency has already been translated into government policies and the commitment of vast expenditures which have in effect largely usurped the possible range of priorities. Thus the major priority in the short term is to examine the foundations of the new training reform agenda - particularly the issue of competency based training and assessment and the implementation of the Mayer and Carmichael reforms. This could include studies which may be critical of

government policies and which may move the government from its current directions as well as studies which will help practitioners to implement these policies in sensible ways. This raises a major issue of how to balance these short term emergency priorities with the longer term research needs of vocational education and training.

So far as the medium and longer term are concerned there are a range of other criteria which might guide research. In our view the one of most important of these criteria for vocational education and training research is the extent to which research undertaken can form a foundation for further research undertaken – either extensions of it or as more applied versions of it. The reason for elevating this criterion to such a high place is the dearth of this type of general issues based research in this field and the need to safeguard the quality of the inevitably increasing research effort carried out by people both inside and outside universities – in TAFE and in industry. We believe that this criteria would also be used to justify projects which were innovative methodologically as well as those concentrating on issues of substance.

Other criteria include the range of criteria identified in the Strategic Review of Research in Education which derive from the application, use and benefits of research. An example of such a criterion is equity and social justice.

Current research priorities in vocational education and training The project asked people to identify Australia's vocational education and training research needs over the next five years. Information collected from the search conference, interviews and submissions suggested a number of themes and topics which are widely perceived as needing research over the next five years. In our view, given the criteria for setting priorities identified earlier (and given the assumption that the ideas of all the stakeholders are represented,) we would argue that the highest priority should be given to research projects which examine:

- the assumptions underlying competency based education/training, ways of implementing competency based training (CBT), the nature of competency based assessment, and the implications for the post secondary sector and training of the implementation of the Mayer report and the Carmichael reforms;
- the nature of workplace learning . This would need to have a high priority on the grounds that there has been little conceptual work in this area and virtually no empirical work on which further studies can build. Clearly this area is of great importance in the national economic agenda and is an area in which an enormous expenditure is occurring;
- the management of the TAFE systems. All TAFE systems are following the prevailing orthodoxies of corporate management with little evidence of whether this is appropriate for public sector education;

- the economic benefits of vocational education and training – both at the micro and macro levels;
- community perceptions of vocational education and training, especially those of high school students, parents and teachers, and how these are formed;
- approaches to the dissemination and use of research in vocational education and training.

Clearly all these areas need research of the more fundamental or

basic kind which will set the research agenda for more applied client-oriented research. The project also identified a number of priority research topics within these themes and outside of these themes, and these topics are listed in the full report of the project.

From priorities to structures

The Report discusses the role of the various organisations and individuals in vocational education and training research, and the structural possibilities to ensure that practitioners and policy makers derive maximum benefit from research and development. A full description of these is beyond the scope of this paper, but they are described in full in the Report itself.

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This definition includes literacy and basic education programs, as they also prepare students for work generally.

From Jacobs, R. L. (1990)

The classification is adapted from similar classifications elsewhere; for example, G. Ramsey (1992) uses the terms 'research on general vocational education and training issues' and 'internal research' and P. Kearns and G. Papadopoulos (1992) talk of 'academic applied research' and 'client or problem oriented applied research'. The classification used also draws on J. Keeves (1990).

From Keeves, J. (1990)

The figures for both vocational education and training and for the whole of education are for research only (not development) but there is no reason to believe that the proportions would be much different if development was included in both cases. Given the difficulties of obtaining data on vocational education and training research expenditure, we have restricted estimates of research to research project expenditure funded by the major government agencies.

The total ARC funding for vocational education and training research, which could be classed as fundamental research, is only \$63,200 (in 1992).

For example, Stevenson, J. (1992)

Burke, J.W. (1989)

Carmichael, L. (1991) and Mayer, E. (1992)

McGaw, B. et al. (1992)