DOCUMENT RESUME

ED 419 988 CE 076 703

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TITLE No Small Change. Proposals for a Research and Development Strategy for Vocational Education and Training in Australia.
INSTITUTION Technology Univ.-Sydney, Broadway (Australia). Research Centre for Vocational Education and Training.
PUB DATE 1992-00-00
NOTE 102p.; Report prepared for the Vocational Education, Employment and Training Advisory Committee.
PUB TYPE Information Analyses (070)
EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS *Educational Research; Foreign Countries; Needs Assessment; Position Papers; Postsecondary Education; *Research and Development; *Research Needs; Research Utilization; State of the Art Reviews; *Strategic Planning; *Theory Practice Relationship; *Vocational Education
IDENTIFIERS *TAFE (Australia)

ABSTRACT

The state of research and development (R&D) in technical and further education (TAFE) in Australia was reviewed. Special attention was paid to the following: current R&D expenditure and output; shortcomings in Australia's current research; organization and funding of research in TAFE; and dissemination of R&D. It was concluded that a stronger research base would benefit TAFE by providing a better information base, critical analysis and accountability, improved cost-effectiveness, varied perspectives, better understanding of education and training processes, and a higher profile for vocational education and training (VET). Research on VET was receiving only about half the funding received for research in other categories of education, and the existing research in VET was fragmented, not focused on general issues, and not being fully used. Seventeen principles related to priorities and funding, R&D organization, and R&D utilization were proposed as underlying principles of a new national research strategy designed to increase the likelihood that research in VET will be focused and easily implemented. It was recommended that the highest priority be given to research projects examining the economic benefits of VET, the assumptions underlying competency-based training, the nature of workplace learning, management in TAFE systems, community perceptions of VET, and approaches to the dissemination and use of research in VET. (Sixteen tables/figures are included. The bibliography contains 152 references.) (MN)

No Small Change

Proposals for
a research and development strategy
for vocational education and training in Australia

A project commissioned by the
Vocational Education, Employment and Training Advisory Committee

Reprinted 1996

NO SMALL CHANGE

PROPOSALS FOR A RESEARCH AND DEVELOPMENT STRATEGY FOR VOCATIONAL EDUCATION AND TRAINING IN AUSTRALIA

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A report prepared for the Vocational Education, Employment and Training Advisory Committee to assist in the development of a national research and development strategy

Third printing, 1996

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FOREWORD

Like many countries, Australia has recognised the importance of vocational education and training—both as a vital part of our education system and for its industrial competitiveness. The result has been greatly increased resources directed to this sector in recent years by governments, and significant reforms at national and state level.

In this context there is a need for a good research and development base to guide the implementation of reforms and the best use of resources. This was the reason for the establishment by the Vocational Education, Employment and Training Advisory Committee (VEETAC) of a Working Party to develop a national strategy for research and development.

The Working Party commissioned the University of Technology, Sydney to assist in the development of this strategy. This report is the main outcome of the UTS project, and it has played a significant role in the development of the national strategy.

P HENNEKEN

Chairperson,
VEETAC Research and Development Working Party

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Printed separately and available on request

SUMMARY OF KEY ISSUES

Background

In the past few years we have seen the development of a national approach to vocational education and training, significant workplace reform in many enterprises and industries, restructuring of many TAFE systems, and increased recognition of the training roles and responsibilities of employers. As a result of these and likely future changes, the need for research into vocational education and training has never been more pressing. Developments that need to take place both to the culture and the organisation of research will represent no small change to the thinking of governments, employers, vocational educators and trainers. This report is designed to serve as a starting point.

The case for research and development

Although there is no simple relationship between research and its impact on policy and practice, and the benefits of research are often not predictable, it is clear that in the past research has influenced policy and practice, and will continue to do so. A stronger research effort will benefit the sector by providing a better information base, critical analysis and accountability, improved cost effectiveness, varied perspectives, a better understanding of education and training processes and a higher profile for vocational education and training.

The alternative to a strong research base in the sector is the danger of stagnation — in particular, the continuing use of outmoded practices or discarded theories and the adoption of practices from overseas.

The current state of research

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 categories of education. Furthermore, the proportion of total funding allocated to research in vocational education and training is extremely small, at 0.2% of total recurrent expenditure for the sector.
The perceived shortcomings of vocational education and training research in Australia are:

- that current research is fragmented;
- that there is little fundamental and general-issues-based research in vocational education and training;
- the research that has been carried out is not fully used;
- that the big issues in vocational education and training (as described below) need much more intensive research; and
- that there is no strong critique of vocational education and training policies and programs.

The need for a national strategy

Many enterprises in Australia are adopting a strategy for change focused on human resource development rather than on technology, and the major challenge for most organisations is the training of their workforce. However, little is known about vocational education and training. This has meant that many current dramatic reforms of vocational education and training have been based on assumptions and hopes rather than on evidence of their desirability.

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 focused and easily implemented. This would give a greater sense of purpose and accountability to research, ensuring that it has an impact and sending signals to current and future researchers in this field.

Principles underlying the R&D strategy

An R&D strategy needs to comply with the following principles:

Priorities and funding

- the setting of national research priorities through the establishment of a three year research and development plan;
- the majority of government funding of R&D to be focussed on the identified areas of high priority;
- the primary focus of Australia's research over the next three years should be to provide knowledge and understanding of workplace reform and the training reform agenda;
- government funding of R&D projects and infrastructure in vocational education and training be allocated on the basis of open competition;
- the strategy should provide an efficient use of resources;

R&D organisation

- research should draw on a range of perspectives provided by a range of researchers and institutions or groups;
- the significant expansion of general issues applied research in areas of high priority for Australia over the next five years;
- the strengthening of links between research in the various categories - that is, fundamental research, general issues applied research and client oriented applied research;
- fostering of high quality research;
- fostering of 'hard nosed' research of practical relevance to industry and vocational teachers and trainers;
- greater coordination of Australia's research effort;
- allocation of resources to achieve a 'critical mass' of researchers and research projects in areas of high priority;

- encouraging university researchers in a range of disciplines and fields to enter the vocational education and training research field;

Utilisation of R&D

- greater collaboration, at the local level, between industry, TAFE and university researchers;
- a shift of emphasis to more effective means of dissemination;
- the expansion of dissemination activities;
- the development of closer links between researchers, policy makers and practitioners.

A body to set priorities

A national body is needed to oversee the setting of priorities for research and development in applied general research in vocational education and training. It is important that this body reflect:

- the necessity for R&D to be tied in to desired outcomes — better information, wider perspectives and informed critique that will contribute to the development of this sector over the next decade;
- an understanding of applied research;
- the need for various stakeholders to be and to feel sufficiently represented; and
- the need for credibility with a range of policy makers, practitioners and researchers.

Three options for such a body are the Education and Training Research Board (recently proposed by the Strategic Review of Research in Education), the Board of the National Centre for Vocation Education Research (NCVER), or a new national body.

Future research

Highest priority should be given to research projects which examine:

- the economic benefits of vocational education and training — both at the micro and macro levels;
- the assumptions underlying competency based education and training, and ways of implementing competency-based training;
- the nature of workplace learning, and the place of language, literacy and mathematics in workplace reform and training;
- management in TAFE systems;
- community perceptions of vocational education and training, and how these are formed;
- approaches to the dissemination and use of research in vocational education and training.

The organisation and funding of research

The key players in the suggested strategies and options are:

- the National Centre for Vocational Education Research;
- universities;
- TAFE systems;
- TAFE teachers;
- industries and industry bodies; and
- the wider pool of researchers.

The proposed R&D strategy needs to address the following areas:

- establishment of a research and development plan;
- fostering the quality and increasing the quantity of research;
- fostering collaboration between industry-based, TAFE and university researchers;
- coordination of research and development;
- training of researchers;
- development of a greater appreciation of research; and
- disseminating the results of research in a way that effectively links it to policy and practice.

Fostering quality and increasing the quantity of research

Suggestions for fostering quality research and increasing the quantity of research and development include:

- the amount of vocational education and training research being significantly increased, partly by attracting competent higher education researchers from other relevant fields into vocational education and training research, to establish a base of independent researchers;
- vocational education and training research being more solidly grounded in theoretical research than previously;
- critical analysis of vocational education and training policies by independent researchers, and the introduction of new ideas;
- involvement of staff with research expertise from universities, TAFE and industry, to ensure that research choices are sensitive to overriding concerns of vocational education and training policy makers and practitioners while still retaining a focus on broader issues and concerns;
- ensuring that there is a critical mass of researchers in at several locations, to provide a base for high-quality and relevant research; and
- the use of multi- or interdisciplinary teams to address certain key issues.

Fostering collaboration

R&D needs to be promoted at both the local and the national level. At the local level, there will be considerable benefits to applied research on general issues if groups of

researchers and practitioners are formed to combine the perspectives and the research strengths of the different bodies, and to enable them to recognise that they share the same ultimate goals. Such groups could comprise one or more relevant university departments, one or more local TAFE agencies, industry groups (e.g. ITABs), and local industry.

Coordination of general-issues-based R&D

Beyond this, however, there is a need for a coordinated national approach, to ensure the best returns possible on funds allocated to research. Of the many options for a coordinating body, a national consortium of R&D partnerships is seen as having many advantages:

- by being spread across several cities the national Research Consortium would ensure that a critical mass of researchers was formed;
- assuming that effective local partnerships are established, the industry involvement should encourage 'hard-nosed' research of value to industry, and the injection of new ideas from partnerships;
- the amount of research would be increased as competent higher education researchers, from both education generally and from specific discipline areas are attracted into research in this field; this would most likely lead to applied research being more solidly grounded in theoretical research; and
- critical analysis of policies by independent researchers would be more likely.

Training of researchers

The following initiatives would encourage the training of vocational education and training researchers: development of special postgraduate courses for TAFE staff and industry trainers; enabling interested teachers to undertake an 'apprenticeship' with an experienced university researcher; TAFE systems including as desirable criteria for promotion to advanced skills teacher the demonstrated capacity to apply research findings in teaching practice; and employers providing scholarships to enable teachers and trainers at every level to undertake appropriate research and post-graduate degrees.

Development of an appreciation of research

In the course of this project it became clear that to large numbers of practitioners and policy-makers in vocational education and training, research and development are largely irrelevant.

The implementation of a national strategy involving close links among researchers in TAFE, industry, the NCVER and universities, will enhance the appreciation of the value of research and development in vocational education and training. Two requirements for all funded projects should be that research in vocational education and training needs to be strongly linked to the situations (in TAFE or in industry) to which it is relevant, and that bids for applied research projects must include dissemination and/or development strategies.

Funding of research and development

Overall, we believe that if we are to have the required amount of high quality research in this field, then the total amount spent will need to increase over a three year period

to approximately 0.5% of the total expenditure from all sources on vocational education and training in Australia. This is the level of expenditure required to undertake research and development on the topics identified as being of high priority. The figure of 0.5% is still well below the research allocation in other fields such as health and agriculture, but significantly higher than the present level of funding of 0.2%. While the time frame for increasing spending is short, it is justified by the urgency of the need to undertake research and development on high-priority topics. The suggested longer term target for funding of vocational eduction and training research, from all sources, is 1%.

Dissemination

The purpose of research and development in vocational education and training is to create new knowledge of vocational education and training which ultimately may lead to changes in practice. However, information collected in this project suggests that the use of new knowledge is retarded by:

- a perception of most practitioners that research is not very useful;
- relatively little research being undertaken by practitioners; and
- a lack of many effective linkages between researchers, practitioners and policy-makers.

In short, there is a lack of a 'research culture' in vocational education and training. The goal of the proposed dissemination strategies broadly is to develop a research culture in which there is a coalition of researchers, policy makers and practitioners.

Key principles for effective dissemination

A general principle for effective dissemination is that the focus of dissemination initiatives and strategies is the need to change people, not to deliver information. This "people come before products" approach means, for example, that the following three dissemination strategies are of decreasing effectiveness:

- getting people together to exchange and interpret information ('people centred');
- helping people in the field 'obtain information and make choices' ('people assisting');
- distribution of material ('information centred').

The implication here is not that 'information centred' and 'people assisting' initiatives and strategies are to be avoided, but rather that by themselves they are unlikely to prove effective. Their main value lies in the support that they offer to the strategies above them in the list.

Other key principles underlying the suggested strategies are:

- optimum effectiveness generally requires the use of multiple simultaneous approaches to dissemination of research;
- there needs to be an expansion of dissemination of R&D to improve its use by practitioners and policy makers.

Dissemination strategies and initiatives

The suggested strategies are based on the assumption that all three approaches to knowledge diffusion need to operate effectively if research and development are to make the fullest contribution to vocational education and training reform. This will require a shift of emphasis away from linear approaches to more interactive approaches in which the relationships between research, policy and practice are more intimate and more complex. The following initiatives have been proposed:

- fostering of quality action research;
- establishing various networks of vocational education and training researchers, practitioners and policy makers;
- enhancing and expanding the dissemination role of the National Centre for Vocational Education Research in order to support the expanded research effort in an effective and efficient way;
- monitoring and dissemination of useful overseas developments;
- inclusion of dissemination strategies in research briefs;
- an international network for vocational education researchers on Internet (through AARNET in Australia); and
- greater use of the media.

All of the suggestions on dissemination should be viewed as an integrated package of measures to improve the efficiency and effectiveness of knowledge diffusion in vocational education and training. To some extent the success of each innovation depends on the successful implementation of the other proposed innovations in knowledge diffusion.

ACKNOWLEDGMENTS

Many people have helped to produce this report, and we acknowledge the contribution of:

... the members of the Working Party, who, via a number of useful discussions, contributed most productively to the end result: Peter Henneken (chair), Joan Armitage, Don Brewster, John Dungan, John Fisher, William Hall, Martha Kinsman, Peter Noonan, and Perce Worsnop.

... the members of the Steering Committee, many of whom played a vital role in the original conception of the project: Gary Bennett, David Boud, Allan Pattison, Glen Rhodes, Hermine Scheeres and Richard Sweet.

... the many people who helped us by participating in the Search Conference, making a submission, or agreeing to be interviewed, as well as Alistair Crombie for conducting the Search Conference and members of OECD and the National Research Center for Vocational Education at Berkeley.

... those who, in addition to members of the Working Party and Steering Committee, have commented on our final draft: Peter Cullen, Geof Hawke, Michael Kaye, Barrie Ritchie, Kaye Schofield, Geoff Scott, Pauline Sedgwick, Peter Seidman.

... and finally, the project's research assistants Maire Sheehan and Claire Moffat, Bernard Cohen for advice on editing, and Carol McGregor for her considerable help in the management of the project.

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Paul Hager

Sydney, October 1992

CHAPTER 1
INTRODUCTION

1.1 OVERVIEW OF THE REPORT

In the past few years we have seen the development of a national approach to vocational education and training, significant workplace reform in many enterprises and industries, restructuring of many TAFE systems, and increased recognition of the training roles and responsibilities of employers. If anything, the rate of change will increase until at least the middle of this decade. As a result, the need for research into vocational education and training has never been more pressing.

Yet there are no national goals for research in vocational education and training, nor is there significant mention of research in the corporate goals of any major organisation. Furthermore, the recently developed *Common and Agreed National Goals for Vocational Education and Training in Australia*[1] contains no mention of research directions and activities.

This report does not argue that research is desirable for its own sake. Our justification is stronger than that: one of the clearest messages we received in gathering data for the report was that there is a need for the data, ideas and critique that good research provides, and effective mechanisms for making this available. Without this, the initiatives in vocational education and training do not have a high chance of long-term success.

This report is very much a creature of its time: many of the issues arise from the current state of research and development in this sector, the newly embraced national approach to vocational education and training, and our perception of present needs. Nevertheless, whatever organisational changes may occur to vocational education and training in the future, the need for a research strategy with similar goals will remain.

Changes both to the culture and the organisation of research will represent no small change to the thinking of governments, employers, vocational educators and trainers. This report is designed to serve as a starting point.

1.2 THE BACKGROUND

a. Research and development in vocational education and training in Australia

Research and development in vocational education and training in Australia spans a diverse range of agencies, subject disciplines and research methodologies. This diversity has been 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

1 Ministers of Vocational Education, Employment and Training (1992)

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
- TAFE colleges;
- the Department of Employment, Education and Training (DEET);
- the National Centre for Vocational Education Research (NCVER);
- universities and specialist centres within them;
- 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), and the relatively recent increasing research activity in vocational education and training in some of the new universities.

The disciplinary origins of vocational education and training researchers are highly diverse, including psychology; sociology; economics; labour markets; industrial relations; linguistics and applied linguistics, physical sciences; technology; philosophy; and history. The diversity of the research methods being used reflects in part the range of disciplines involved, and results in some research in this area being carried out in economics, industrial relations and business studies departments as well as education or vocational education departments.

b. The context of research into vocational education and training

Research into vocational education and training reflects 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 of classification, as well as the problem of vocational education and training generally having less 'kudos' attached to it, which carries over into research.

c. The National Centre for Vocational Education Research

This report acknowledges the substantial contribution made by the National Centre for Vocational Education Research (previously the TAFE National Centre for Research and Development) to research in vocational education and training in Australia. Its establishment a decade ago was a major national achievement. A noteworthy feature of its establishment and funding is the cooperation of the state, territory and commonwealth governments that is displayed.

With limited resources (its core funding is about $1 million per year) the NCVER has raised the profile of vocational education research, contributed to national debates, and provided a vital national focus for research and dissemination activities. The NCVER has been ahead of its time in broadening its focus from publicly funded vocational education to issues well beyond that, a move confirmed by its change of name in 1992.

It is interesting that no matter what comments individuals interviewed during the project had about the NCVER's work and focus, they agreed that it has a vital role to play in vocational education and training research and development. Naturally, the NCVER figures prominently in the proposed national research strategy. Because of its established position and activities, we have taken the NCVER as a 'given' and have concentrated on ways in which research and development efforts might be expanded overall in collaboration with it.

1.3 FUNCTIONS OF RESEARCH IN VOCATIONAL EDUCATION AND TRAINING

Financial support for social research in general and vocational education research in particular is awarded with the expectation that it will lead to some betterment or improvement in practice. In this regard, educational research is different from most research in science for example, where expectations are, generally, only that knowledge will be generated. It also differs from the sciences in that it will rarely generate unambiguous results which might provide answers.

Whether the extent of the expectations of educational research are reasonable, is questionable. Twenty years ago it was common to see the claim that educational research had the potential to solve deep social problems. The National Institute of Education in the USA, for example, was set up in the 1970s with the expectation that it would provide research data on which Government could base policies designed to overcome the effect of race and culture on educational achievement. The failure of extraordinary and naive expectations of this type, has led to quite widespread pessimism about the usefulness of educational research.

Explanations for this pessimism are quite varied, including such things as poor quality, inadequate support, the claim that most questions can be answered intuitively anyway, the different time frame of researchers and policy makers and practitioners, and so on. This pessimism is often based in fact. However, it is based on a highly simplistic view of the relationship between research and practical outcomes — one that assumes that data can be generated that will lead directly to some application which will solve pressing problems. Figure 1.1 shows the ways in which research can interact with and be influenced by other factors, and helps to show why a simple expectation of research leading immediately to change is naive. Research needs to be seen as part of a wider political process which sensitises policy makers to the use of systematically derived knowledge in the development of policy.

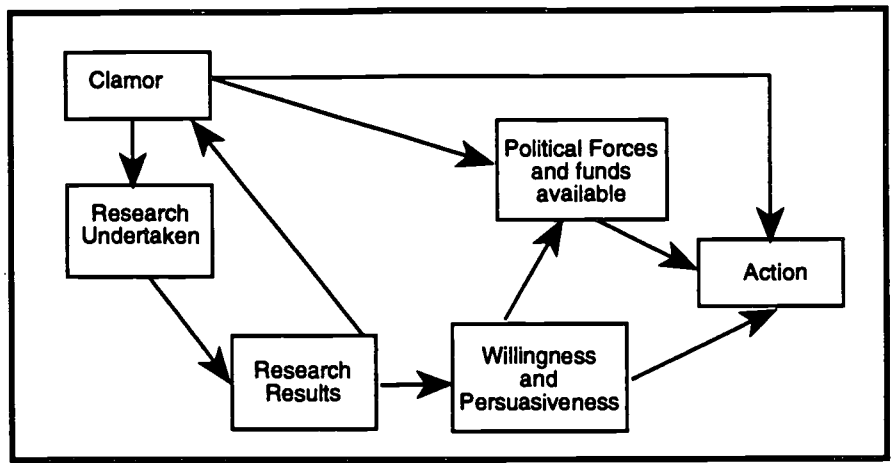

Figure 1.1
Research in a broad context[2]

There are, in fact, many examples of the impact of educational research on educational practice and policy, and the impact can be seen to emanate from both fundamental and applied research. It has been pointed out that fundamental research which generates concepts, theories and models contributes to the basic ways teachers (and policy makers) see things and thus indirectly alters classroom practices and the curriculum.[3]

However the fact that much good research has been undertaken but not acted upon means that the generation of the knowledge is not sufficient to make the applied research useful. What is needed is a different conceptualisation of the relationship between the practitioner/policy maker and the researchers. Research needs to be seen by both groups as a form of activity in which they interact to generate potentially useful knowledge which will be disseminated and then interpreted in a variety of contexts.

The case for research and development

Although there is not a simple relationship between research and its impact on policy and practice (see chapter 5 and the figure above), and the benefits of research are often not predictable, it is clear that in the past research has influenced policy and practice, and will continue to do so. A stronger research effort will benefit the sector in the following main ways:

2 Postlethwaite, T. Neville (1991)

3 Getzels, J.W. (1991)

A better information base

Data on Australia's vocational education and training system is more readily available now than before, and better information is becoming available on participation in training, particularly in the workplace, on expenditure on training and on the qualifications of the workforce. However, there is still a lack of data on many issues, which research can provide — for example, the costs and benefits of training in enterprises, the performance of TAFE-trained students in higher education, and the effect in the workplace of a linguistic and culturally diverse population.

In addition, research can lead to better methods of collecting, analysing and interpreting the data that is available.

Critical analysis and accountability

The major developments that have occurred in vocational education and training over the last half decade will change the sector forever. However, as yet there has been no careful analysis of the effects of the changes, or any critique. With research will come the evaluation and review that is necessary to ensure ongoing refinement and consolidation of the changes. It will also bring the necessary accountability.

Varied perspectives

There is a need to draw out different views of vocational education and training (see Figure 1.2). There is also a need to examine the different perspectives and approaches that are to be found overseas, in order to selectively adapt those ideas that are appropriate to Australia. Research has the capacity to place these varied perspectives in a framework to enable the best policy decisions to be made.

A better understanding of education and training processes

Much development remains to be done on the concepts of teaching and the relationships between training strategies and outcomes. A current urgent need is for an evaluation of workplace training and competency based training, but there are many others. The following example is but one of dozens on which more information is needed:

THE BENEFITS OF RESEARCH: A CASE STUDY

We know little of the needs of level 1 workers in Australia. Considerable resources are being employed to teach these workers literacy and numeracy skills and other things to enable them to participate in the award restructuring process. This is desirable on both efficiency and equity grounds, but teachers find that there is resistance amongst these workers. Why? Are they being taught the wrong things in the wrong way? What influences their learning — emotional as well as cognitive? How can an understanding of this be translated into more appropriate materials and training approaches?

Answers to questions like this are badly needed, and research of this type needs to be taking place irrespective of particular government policies such as workplace reform. The alternative, simply, is that much money spent on training

could be wasted by the use of inappropriate techniques used in an inappropriate way.

A higher profile for vocational education and training

Finally, it is important for the health of Australia's education systems that the standing of vocational education and training be more prominent than at present — both within the education system and within the community. A high research profile is one step towards this.

The alternative to research and development

The alternative to a strong research base in the sector is the danger of stagnation — in particular, the continuing use of outmoded practices or discarded theories and the adoption of practices from overseas. These alternatives are clearly incompatible with Australia's need to be internationally competitive. Rather, Australia's need is the opposite: to gain competitive advantages. Our vocational education and training policy has the potential to provide this, but only if we do the research which enables us to innovate instead of following the trends of others.

In summary, both fundamental and applied research can be of use in vocational education and training. It is self evident that decisions based on knowledge generated through systematic high quality research will be preferable to decisions made arbitrarily. However, for the knowledge generated to be actually used will require both policy makers and researchers to recognise that traditional assumptions about the direct applicability of research to specific problems are unrealistic.

1.4 DEFINITIONS

In producing this 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.[4] '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.

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

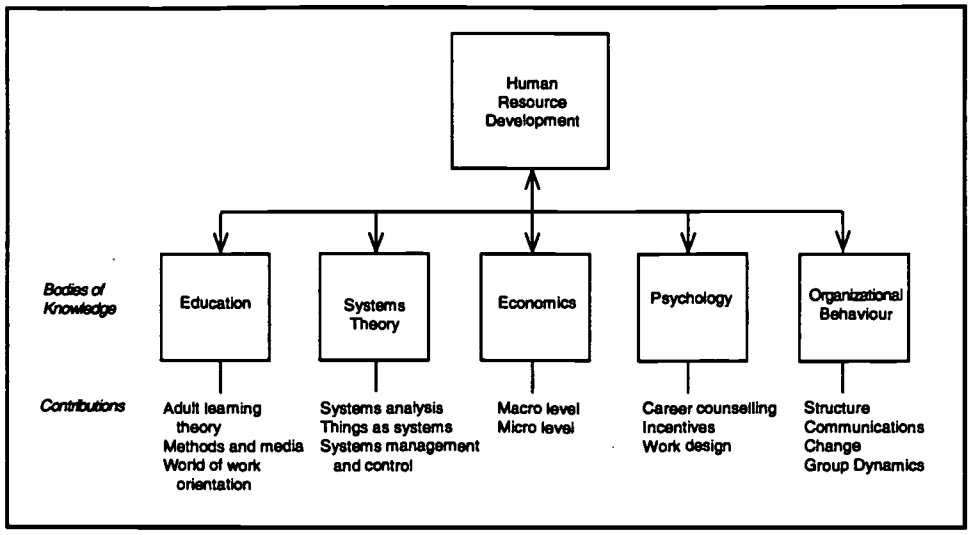

Figure 1.2
A pictorial view of human resource development [5]

b. 'Research and development'

Throughout the project people have responded very differently when asked what research and development was needed. Responses focused on gaps in 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 availability 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 factors directly relevant to it, no matter how this knowledge is obtained, and the non-routine application of this knowledge.

The key to this definition is the term 'non-routine'. 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 into the research process would.

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

5 From Jacobs, R. L. (1990)

1.5 CATEGORIES OF RESEARCH AND DEVELOPMENT

Our terms of reference indicate that the strategy should cover the fullest possible range of categories of vocational education and training research. In broad terms this would include fundamental research, applied research and development projects. There is some question as to whether 'fundamental' research can be conducted in an applied area such as vocational education and training. However, we see no sharp boundaries between fundamental and applied research, and between applied research and development, but rather a continuum, with a need for the full range of types of project to be undertaken. To help us discuss the different types of research and development, we classify R&D under the following headings[6]

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 research:

This type of research aims to provide principles or models that give an understanding of vocational education and training beyond specific contexts, and produces 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. Large-scale research normally uses resources outside the client organisation and expends considerable resources in finding a solution. In vocational education and training this approach is commonly used by policy-makers through commissioning consultants or academics to research particular issues or problems. As discussed in Chapter 3, this type of applied research accounts for the largest amount of vocational education and training research in Australia.

At the other extreme, small-scale investigations rarely require outside resources. 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'.

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

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'.[7] One strength of good fundamental research is that its results are still available, and relevant, long after much applied research has ceased to have much meaning. However, it is often of less obvious relevance to immediate issues. To quote a recent book on the connection between research and education:

> "The benefits of basic research are seldom if ever predictable in advance; they are often unanticipated and still more often the outcome of complex, discontinuous sequences of discovery, insight, and invention. Investment in basic research must be regarded as investment in a process that is expected to yield substantial contributions to individual and social well-being, but it cannot be regarded as a direct purchase of those contributions."[8]

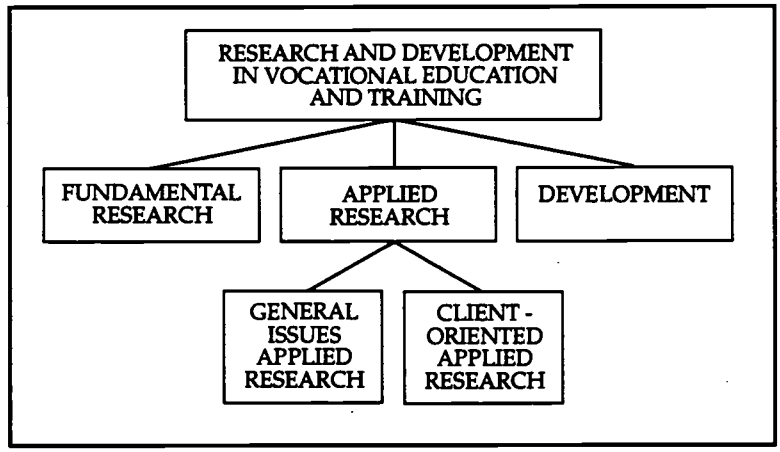

Figure 1.2
Types of research and development

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.

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7 From Keeves, J. (1990)

8 Committee on Basic Research in the Behavioural and Social Sciences (1991)

The proposed strategies include all these categories of research, and also development projects which include an element of client-specific research. In this report, all references to a research strategy should be understood to include development projects of this type.

1.6 THE PROJECT

a. Origins and aims

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.[9]

The Vocational Education, Employment and Training Advisory Committee (VEETAC) then established a National Research Strategy Working Party, which 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 a 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.

b. Processes

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 1.3, the processes involved five primary research techniques:

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

9 TAFE National Centre for Research and Development (1991)

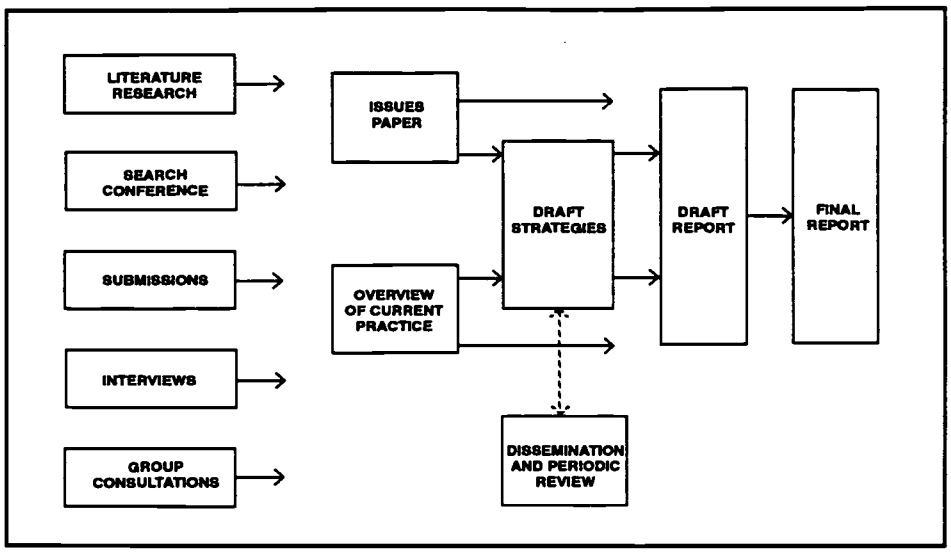

Figure 1.3
Flow chart of project

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 20–21 May 1992 in Sydney, and involved 27 people. The distribution of participants among the various interest groups is given in Appendix B.

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. The distribution of submissions among interest groups and State or Territory of origin is given in Appendix B.

Interviews and group consultations

A total of 82 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 among interest groups, the many requests and opportunities provided for comment by small employers and employer organisations resulted in few contributions. A full list of people interviewed is given in Appendix D.

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 and held in Sydney on 16–17 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.

CHAPTER 2
THE NEED FOR A RESEARCH STRATEGY

2.1 THE CURRENT CONTEXT

One of the factors behind the current period of significant change is Australia's low productivity compared with our major international competitors. A recent study of Australian firms compared with world best practice showed that, on average, Australian firms need to improve productivity by 25% to catch up with comparable countries[10], and to produce enough goods of the right price and quality to satisfy domestic consumers and replace demand for imported goods.

To meet these new market requirements and in response to increasing international competition, enterprises are introducing competitive strategies involving workplace reform — the introduction of new forms of work organisation based on a highly skilled workforce. For most industry sectors it is no longer sufficient merely to cut costs to become more efficient. To produce quality, become flexible, and innovate, firms will need to implement substantial changes in the workplace, such as:

- introduction of new technology;
- job redesign;
- restructuring of industrial awards or enterprise agreements;
- a more highly skilled workforce by means of vocational education and training and enhanced career paths;
- development of an appropriate structure and culture.

Many enterprises in Australia and other developed nations are adopting a strategy for change focused on human resource development rather than technology. Technological change will continue to be important for the competitiveness of most organisations through the 1990s, but the evidence suggests that this is not as central as it has been in the past. The major challenge for most organisations is the training of their workforce.

In a recent speech comparing the Australian economy to that of our neighbours in Asia, Prime Minister Keating claimed that the major long term advantage that Australia possessed was the quality of its education system. In recent times the view has been widely expressed that vocational education and training is a vital part of a national competitive strategy. Yet we know little about the relationships between productivity, workplace reform and training, and very little research has been focussed on these relationships. This lack of research cannot continue if the potential of the vocational education and training system to play its part in the overall national economic strategy is to be realised.

10 E. Shann and V. Fitzgerald (1990)

In recognising the key role of vocational education and training, the Federal Government has implemented a strategy of significant reform of vocational education and training in recent years. It has followed policies aimed at increasing the quantity of training, through the training guarantee legislation, and its quality, through the competency standards framework established by the National Training Board. The principles underlying these policies were taken up by the report of the Finn committee[11] which recommended increased participation rates in vocational education and the development of employment related key competencies for all young people. A key component of the reform process will be the implementation of the recommendations of the Carmichael report[12], which provides a blueprint for changes to initial vocational education. The recommended changes are increased participation in vocational education, flexible delivery arrangements, and a competency based approach.

To attain these objectives, the Federal Government has recently committed itself to fund a substantial expansion in student numbers in TAFE, and has negotiated with the State and Territory governments important changes to the administration and funding of vocational education. Recently implemented changes in vocational education and training, together with those that are planned, are potentially the most dramatic reforms in the history of vocational education and training in this country.

However, little is known about vocational education and training. Very little research has been undertaken about the TAFE system and virtually none about the less formal training arrangements and practices in industry. This has meant that in the past and currently, many dramatic reforms of vocational education and training have been based on assumptions and hopes rather than on evidence of their desirability. In the immediate future, research would greatly assist our understanding of how to best implement the proposed Finn and Carmichael reforms and other initiatives.

2.2 THE NEED FOR A STRATEGIC APPROACH

Apart from the actual shortage of research (see chapter 3) one widely expressed comment referred to the lack of 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 initiatives. As a result of this (and also because there are almost no important research areas in which there are sufficient researchers to form a critical mass) research is spread thinly over a range of topics, with many important issues being under-researched and some not researched at all. Further, the research that is carried out tends to arise either from individuals' interests or from the needs of particular TAFE systems or government or industry bodies at a certain moment.

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 focused and implemented.

There is widespread support for this approach, which would give a greater sense of purpose and accountability to research, ensuring that it has an impact, and sending

11 Finn, B. (1991)

12 Carmichael, L. (1992)

signals to current and future researchers in this field. The use of strategic plans for research and development has been particularly successful in some primary industries both in Australia and overseas, and is given as one of the main reasons why research in those areas is valued by practitioners in these industries.

2.3 PRINCIPLES UNDERLYING AN R&D STRATEGY

An R&D strategy needs to comply with the following principles, which are based on discussions held in the course of the project, and submissions received:

Priorities and funding

- the setting of national research priorities through the establishment of a three year research and development plan;
- the majority of government funding of R&D to be focussed on the identified areas of high priority;
- the primary focus of Australia's research over the next three years should be to provide knowledge and understanding of workplace reform and the training reform agenda;
- government funding of R&D projects and infrastructure in vocational education and training be allocated on the basis of open competition;
- the strategy should provide an efficient use of resources;

R&D organisation

- research should draw on a range of perspectives provided by a range of researchers and institutions or groups;
- the significant expansion of general issues applied research in areas of high priority for Australia over the next five years;
- the strengthening of links between research in the various categories - that is, fundamental research, general issues applied research and client oriented applied research;
- fostering of high quality research;
- fostering of 'hard nosed' research of practical relevance to industry and vocational teachers and trainers;
- greater coordination of Australia's research effort;
- allocation of resources to achieve a 'critical mass' of researchers and research projects in areas of high priority;
- encouraging university researchers in a range of disciplines and fields to enter the vocational education and training research field;

Utilisation of R&D

- greater collaboration, at the local level, between industry, TAFE and university researchers;

- a shift of emphasis to more effective means of dissemination;
- the expansion of dissemination activities;
- the development of closer links between researchers, policy makers and practitioners.

2.4 SCOPE OF THE STRATEGY

Chapter 1 outlines a number of different categories of research (applied research on both general issues and client-specific issues, and fundamental research) as well as development. An R&D plan should be comprehensive in the sense that it covers all categories of research and development. Nevertheless it will have a differing impact in different categories.

Applied research on general issues

It is here that there is the most potential for impact, partly because this represents the area in which there has been least coordination in the past, and in which the need is most pressing. For this reason this report tends to emphasise this area.

Development and Client-oriented applied research

There is already national funding and coordination of research and development in many aspects of client-oriented research and development; some examples are:

- Women's Standing Committee on Vocational Education and Training;
- Working Party on Competency Based Training;
- Working Party on Recognition of Training;
- Working Party on Research and Development;
- National Staff Development Committee;
- National Language and Literacy Institute of Australia;
- Australian Committee on Training Curriculum (ACTRAC).

Some of the research and development commissioned by such committees could be classified as general issues applied research, but most would be classified as client oriented because it usually addresses the policy concerns of the group of Commonwealth, State and Territory vocational education and training agencies.

The support of research and development by these national committees is seen by many as a welcome advance on previous arrangements because it helps to reduce wasteful duplication of research and development that may be conducted by individual agencies. Such national projects have the potential for higher quality because of the larger funding pool and inputs from several vocational education and training agencies. Some of these national committees have been established for many years but most have been established in the last two years under the VEETAC structure.

Fundamental research

The field of vocational education and training contains few areas for fundamental research that are specific to the field. However, some fundamental research in education and disciplines such as economics and psychology can provide valuable knowledge and understanding of concerns in vocational education and training.

2.5 STEPS TOWARDS A RESEARCH AND DEVELOPMENT PLAN

The production of this Report, together with the report on overseas developments[13] is one of the first steps towards the development of a research and development plan. Steps that could be taken from this point are:

a. establishment of a body to oversee the development of a R&D plan

b. decision on a process for setting priorities

c. agreement on the criteria for setting priorities

d. identification of priority areas for research.

The ideas set out below are intended to serve as a starting-point for the establishment of a plan. The need to differentiate between the different types of research, and between research and development, will make any plan appear convoluted. This cannot be avoided — the very nature of research means that many different bodies will be involved, explicitly or implicitly, in setting goals.

a. A nationally-oriented overseeing body

The prime requirement for a R&D plan is that both the plan itself, and the process by which it is developed, have the confidence of the many stakeholders: governments (as the bodies that will inevitably provide most of the funding), employers and industry groups, unions, TAFE systems, other vocational education providers, bodies concerned with vocational education and training, universities, and researchers themselves. While not representing a totalitarian approach to research, a body is needed to establish priorities and goals, and monitor progress.

Many of the comments made in submissions, interviews and the search conference would suggest that the most appropriate approach is one in which research priorities are set directly by the stakeholders in the field of vocational education and training. On the other hand, there is the view that vocational education and training is best viewed as a subset of the field of education, and priorities set accordingly. The arguments are summarised in Table 2.1.

13 Kearns, P. and Papadopoulos, G. (1992)

R&D in vocational education and training — how should its priorities be set?

Reasons for priorities to be set only within the immediate context of vocational education and training:

- A mechanism is needed through which a research strategy can be implemented in line with the national focus for vocational education and training.
- It is appropriate for a national body concerned with vocational education and training to discuss priorities and ensure minimal unnecessary overlap of research within its own area of responsibility.
- Research and development priorities need to be set in a way that reflects the diversity of views and activities in the sector.
- There is some disenchantment generally in the community with the value of past educational research.
- There is likely to be a need for a large proportion of the available funds to be spent on development and on research targeted to specific objectives.
- Vocational education and training has important links with economics and industrial relations as well as with much of education.

Reasons for priorities to be set within the wider context:

- Priorities in vocational education and training should influence the educational research agenda as a whole, and vice-versa.
- There is too small a number of researchers in all of education nationally, and in vocational education and training in particular, to separate this sector out, and there is much to be gained by having vocational education and training interests incorporated in the structure proposed by the Strategic Review, if accepted.
- Vocational education generally is seen as having less 'kudos' attached to it, a problem that carries over into research. As long as it is treated separately, there is the likelihood of it remaining the 'poor cousin' in the eyes of educational researchers.
- Research in vocational education and training needs to be in an environment in which some of its basic assumptions are subjected to a wider scrutiny.

Table 2.1
Setting priorities for research and development in vocational education and training

It is not the task of this Report to recommend the establishment of a particular body. However, it is important that a nationally-oriented body be created which reflects:

- the necessity for R&D to be tied in to desired outcomes — better information, wider perspectives and informed critique that will contribute to the development of this sector over the next decade;
- an understanding of methodological and applied research issues;
- the need for various stakeholders to be and to feel sufficiently represented; and
- the need for credibility with a range of policy makers, practitioners, and researchers.

There are three options:

The Education and Training Research Board

The recently-completed Strategic Review of Research in Education[14] recommended the establishment of an Education and Training Research Board at a national level, sponsored by the major stakeholders in education, financed by a small levy on educational expenditures, and with a Board broadly representative of the stakeholders in educational research (including TAFE). The Board's functions are described in the Report as being to:

> "• support and encourage research to foster long-term improvements in Australian education;
>
> • identify priority areas for research support;
>
> • improve the dissemination and application of research in educational practice; and
>
> • develop and implement strategies to ensure that research careers are attractive and that high-quality research training is provided."

Furthermore, the Report identifies 'Education, Training and Work' as one of the initial priority areas of the proposed Board.

As long as a specialist panel were created in the area of vocational education and training, it is likely that this proposed Board would meet most of the criteria outlined above; its credibility with stakeholders, however, would only be built up over time.

The Board of the NCVER

The Board of the NCVER has experience in governing the NCVER and, to an extent, overseeing the work done by the Centre. However it would not be appropriate for a body that conducts research to be responsible for coordinating and funding a substantial part of government investment in research. Even if the NCVER Board were to be broadened to enable such a broader role to be fulfilled, the NCVER's position could only be compromised by a responsibility such as this.[15]

A new national body

It would be possible for MOVEET to establish a broadly representative body to oversee the development of a R&D plan. However, it is vital that any such body be constituted with regard to the criteria listed above.

b. A process for setting priorities

The national level

During our discussions we encountered a number of concerns which need to influence the way in which research and development priorities are developed and overseen:

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14 The Strategic Review of Research in Education was a major review carried out under the Discipline Research Strategies program of the Australian Research Council, and financially sponsored by sixteen orgranisations with an interest in educational research. It was conducted during 1991-92 and the final report was released in September 1992. It appears in the Bibliography as McGaw, B. et al. (1992).

15 A similar argument was used in the Strategic Review of Research against ACER becoming responsible for allocation of educational research funds (McGaw et al. 1992).

- difficulties faced by peak bodies in providing, to an ever-increasing number of committees, representatives who have a thorough knowledge of all aspects of the industries they cover;
- some doubt about the effectiveness of tripartite bodies;
- concerns that the laudable aim of 'responsiveness to the field' can bring with it an inherent disadvantage — basing priorities on suggestions from practitioners, without considering the wider context, could lead researchers backwards into issues which need to have been researched more thoroughly in the past, but from which research now would not yield dividends; and
- concerns that research and development projects have often been commissioned by groups which do not contain R&D expertise in vocational education and training.

This leads us to suggest that the priority setting process needs to involve a number of steps: identification of areas of general inquiry; involvement of stakeholders in setting of research themes; identification of people (within each area) able to make a significant contribution to the debate; structured group meetings to clarify the issues; then use of an appropriate technique (e.g. Delphi) to reach some agreement on the relative importance of issues[16].

This approach acknowledges that within, say, TAFE systems, there are many different interests and perspectives: a director-general of TAFE will have a different perspective to a regional director, who will in turn have a different set of concerns and priorities to a senior head teacher, as to what research is lacking. The same argument applies to all stakeholder groups.

The results of such a process would be free of many of the criticisms made of current mechanisms.

Whatever strategy is adopted, priorities need to be reviewed regularly, but not so frequently that there is a lack of continuity and coherence in the research that is undertaken. We would suggest a triennial setting of a research themes in which priorities are identified, with an annual review of the priorities and the outcomes of research projects.[17]

However, the danger of any allocation of research funds by a widely-representative body is that, in the way familiar to those who serve on committees, decisions can owe more to compromise or expediency than to real national needs. For the next few years, Australia's prime need is for research to which particular groups are committed, and decisions on relative priorities are best devolved to those groups. Under this approach, most of the funds would be allocated to projects jointly agreed as being important, but a proportion of available research funds (say 20%) would be set aside for projects considered important by only one stakeholder:

- projects identified by industry bodies (e.g. ITABs);
- projects identified by governments and TAFE systems;

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16 Another approach is illustrated by the process used in the Netherlands, as outlined in Appendix G.

17 For example BIBB (the German vocational education research organisation) has a five-year program, with a number of annual activities within in (Keams and Papadopoulos 1992).

- projects identified by employers; and
- projects identified by unions.[18]

One of the prime needs is to 'second-guess' likely new developments, in order that research can be carried out before it is needed — an oft-quoted example is the need, now recognised, for research to have been carried out into competency-based training several years ago. It is likely that the use of the above strategy would increase the chances of such forward-looking research being carried out.

The local level

At a local level, there will be considerable benefits to applied research on general issues if groups of researchers and practitioners are formed to combine the perspectives and the research strengths of the different bodies, and to enable them to recognise that they share the same ultimate goals. Such groups could comprise one or more relevant university departments, one or more local TAFE agencies, and local industry. In many cases they could be built from existing informal partnership arrangements. Although universities should not dominate these partnerships, they have a responsibility to play a significant role because they usually have appropriate infrastructure, they have a central role in the training of researchers, they have an ongoing commitment to undertake research, they have established mechanisms for cooperative consortia, and they contain people with a range of perspectives.

Such an arrangement would provide the ideal linking of applied research and practice, would provide opportunities for the setting of goals, and would materially assist in the development of a vocational education and training research culture. It is possibly the only way to proceed to a greater understanding within industry of the benefits of R&D, and to overcome any doubts about the ability of universities to undertake 'hard-nosed' research which is of value to industry.

c. Criteria 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.

This is supported by the point, again made on many occasions, that while short term directions for vocational education and training had been set through client oriented research, research was needed urgently to enable implementation of the agenda to be based on sound evidence. This need could be met, at least in part, by an increase in 'general issues research' which is targeted to identified medium term priorities.

The danger of setting priorities is that there may be no room for researcher-initiated projects which may prove be of medium or long term value. In our view this is not a convincing argument against the setting of priorities — particularly in this case, where there will be limited resources, limited numbers of researchers in the short term, and very little existing work.

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18 This approach has been successfully used by the Centre for Working Life in Sweden.

However, not all worthwhile research results from strategic planning, nor do representative bodies always arrive at an ideal research plan. In any plan there needs to be room for research carried out at the discretion of researchers in whom there is confidence. We suggest that 20 per cent of the available funds should be allocated to specialised centres (see Chapter 4) to cover basic infrastructure and to enable research staff in such centres to initiate and undertake particular research projects in specified areas. Although such research may fall outside existing priorities, it has the potential to influence them in the longer term.

Suggested criteria

A number of factors need to guide the setting of priorities. As shown in Figure 2.1, it is not sufficient to identify research and development projects which could have potential benefits: the research must also be feasible (both in terms of potential and capacity) and there must be a good chance of it being used.

The criteria are:

- the potential benefits to vocational education and training, particularly focussing on topics for which there is a major research need, and also the extent to which research undertaken can form a foundation for further research — either extensions of it or as more applied versions of it; [19]
- the ability for the research to be utilised — this criterion would strengthen the case for projects which were innovative methodologically as well as those concentrating on issues of substance, and weaken the case for projects in areas in which there was little chance that research findings would be acted upon;

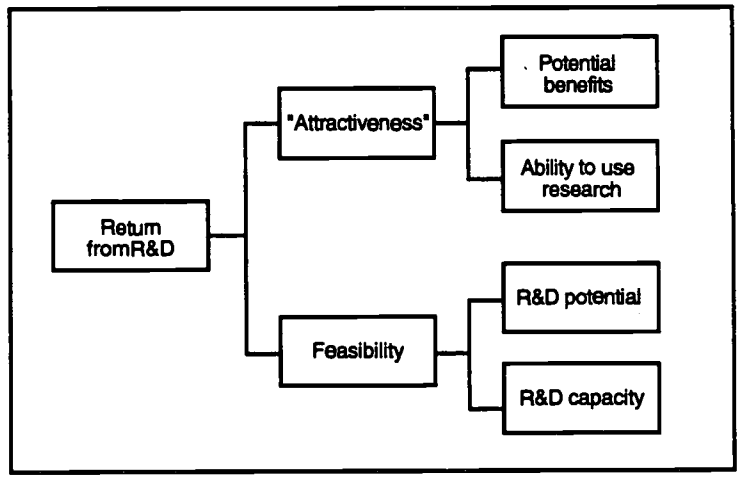

Figure 2.1
Criteria for setting priorities[20]

- R&D potential, in terms of the gap between what is known at present and what it is possible to find out;

19 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 in TAFE, universities and industry.

20 Adapted from CSIRO Five Year Plan (1992)

- R&D capacity, in terms of there being sufficient researchers with the required skills for a particular piece of research to be carried out.

All four criteria need to be satisfied for a particular R&D project to have a high chance of success in terms of its ultimate effect.

It is also important that, in identifying priority areas and projects, there be a balance between long-term and short-term projects, between high-risk and low-risk, and between researchers with different perspectives.

It is important to point out that not one submission or interviewee suggested that the research needed was of the single disciplinary type which is often seen as the orthodoxy in university research. Rather, the general view was that there were problems which needed to be examined and that it was likely that these could be best addressed by coalitions of researchers from different disciplines and different backgrounds. This point is examined in more detail in Chapter 4.

In summary, the following issues should be considered for the setting of priorities in vocational education and training research:

- the need for general-issues-based research which provides knowledge and understanding for other more client-oriented research;
- the provision of knowledge on effective ways of implementing vocational education and training reform;
- relevance to current government vocational education and training policies;
- current areas of research strength in vocational education and training in Australia;
- potential benefits to workplace reform; and
- equity and social justice.

d. Priority areas for research

A large number of possible research needs were identified during the data gathering for this project. These are have been analysed using the above criteria for setting research priorities, and are listed in section 3.4 in the next chapter.

As one of the themes of this report is that previous research has been too little tied into development and dissemination, the process of identification of projects needs to be accompanied by:

- setting of time-lines for review
- plans for development
- dissemination strategies.

e. The connection between priority-setting and funding

In any discussion on a research strategy, it is necessary to recognise the connection between the setting of priorities and funding decisions. In some cases those who will set R&D priorities are not the same as those responsible for funding R&D. The setting of priorities by one body will normally influence the allocation of funds by another, while of course the use of the allocation of funds as a *de facto* mechanism for setting priorities is well known.

Whatever body sets priorities for all categories of research listed above, some effect on the process is inevitable from those who will fund the different categories of research.

2.6 MONITORING AND REVIEW OF THE STRATEGY

Monitoring and review of the research and development strategy should be designed to indicate when and how to make refinements to the strategy, and to provide an overall indication of the success of the strategy. This could be achieved by:

- monitoring of the inputs (research expenditure, number of full-time and part-time researchers, number and location of research centres/partnerships etc.) and outcomes (number of research projects completed in each category, impacts on practitioners and policy makers, impacts on vocational education institutions and industry) by the national body which has the responsibility of developing and implementing a research and development plan. It is suggested that the monitoring be ongoing, or conducted at least annually;
- a review of the strategy after five years to determine its overall success and to provide a basis for renewal or revision of the strategy. This could be conducted by a national committee specially established for this purpose.

An improved system of recording of research and development expenditure would greatly assist the monitoring of research at national and state/territory level. One approach that should be considered is the central collection of information on all research and development projects, based on nationally agreed definitions of research and development. This could be achieved by the enhancement of the 'Projects in Progress' database of VOCED. An enhancement of the VOCED database, as suggested, could provide both useful information on research and development expenditure and a comprehensive database of all of Australia's research and development output in vocational education and training.

The monitoring of research and development should be undertaken by the same national body that has the responsibility for the setting of a research plan in which priorities are identified. As described above, this body also would undertake an annual review of research and development priorities and the outcomes of projects. The monitoring of research and development inputs and outputs, as suggested here, would support this annual and triennial review process.

CHAPTER 3
THE CURRENT STATE OF RESEARCH

3.1 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.

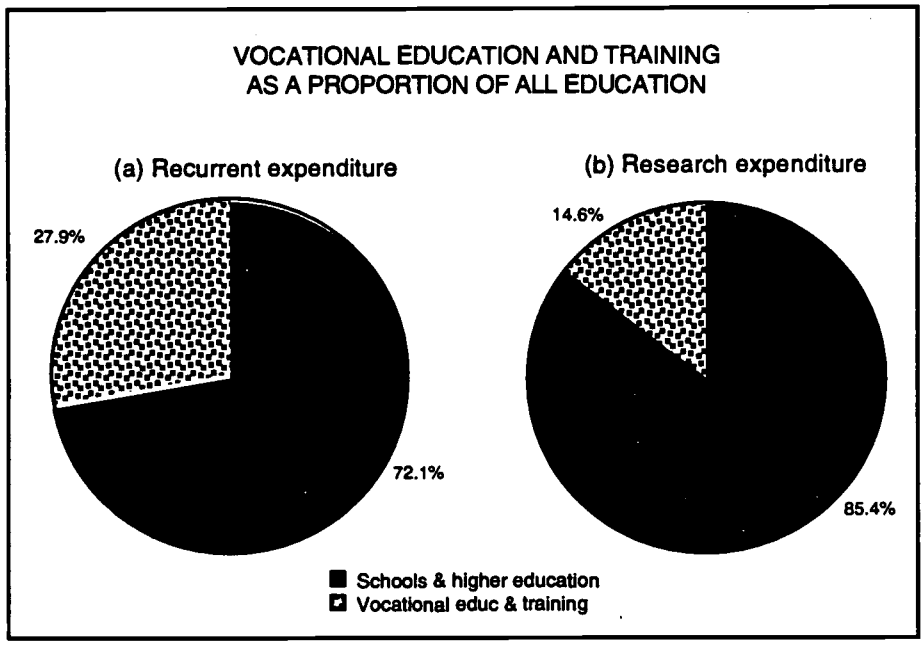

Figure 3.1
Vocational education and training compared to the whole of education and training
(a) recurrent expenditure
(b) research expenditure [21]

Figure 3.1 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.[22]

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21 The total recurrent expenditure is $19.2 billion, and the total research expenditure is $81.1 million. See Appendix C for details and sources

22 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.

The detailed figures on which the charts are based, and the sources of data, are given in Appendix C. 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 (these are listed in Appendix C).

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[23]. 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. Figure 3.2 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[24]. Further, the research percentage for vocational education and training is well under half the rate for education overall. 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 (see section 1.2).

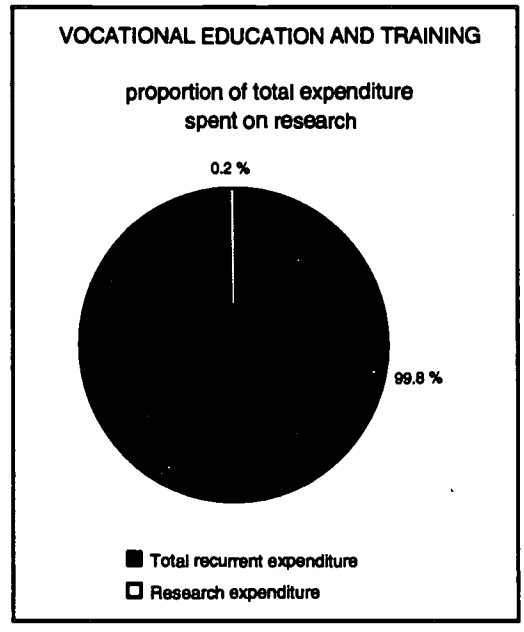

Figure 3.2
Research expenditure on vocational education and training as a percentage of recurrent expenditure[25]

The collection of data on vocational education and training research expenditure in Australia is hampered by:

- difficulties in defining precise boundaries for research;

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

24 For example, the report compared the education percentage (0.35% overall) with the health research percentage of 1.4%. See page 25 of McGaw, B. (1992). Using the recurrent expenditure figures from the AEC Review Committee (1991) report, and separating school and higher education from vocational education and training, we calculate the research expenditure for schools and higher education as 0.51%, and vocational education and training as 0.22%.

25 See Appendix C for details and sources

- the lack of any central statistical collection of research expenditure, with expenditure spread over a wide range of agencies.

The approach we have taken is to define research very broadly, but to exclude expenditure on development projects (such as curriculum development) which fall outside our research definition.[26]

TABLE 3.1

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 and/or administration of vocational education and training; links between different education sectors; 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;...)

The difficulties we encountered in collecting data on research expenditure highlighted the need for improved recording of research expenditure to obtain better monitoring

26 Many of the agencies that we contacted did not separate research expenditure from expenditure on development projects. Also, many of the agencies indicated that some of their development projects included a research component. We asked these agencies to make judgements of which project expenditures would be classified as research given our definitions. The Australian Bureau of Statistics collects information on research expenditure in Australia on Education and other major fields, but unfortunately ABS does not breakdown educational research into components. Thus, statistics on vocational education and training research can only be obtained by contacting all the agents known to fund or undertake such research. The agencies which have been contacted are listed in Appendix C.

of research at national and State and Territory levels. This would assist the future monitoring and review of the national research strategy. One approach that should be considered is the central collection of information on all research and development projects based on nationally agreed definitions of research and development. This could be achieved by the enhancement of the 'projects in progress' database of VOCED.

3.2 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 in Table 3.1.

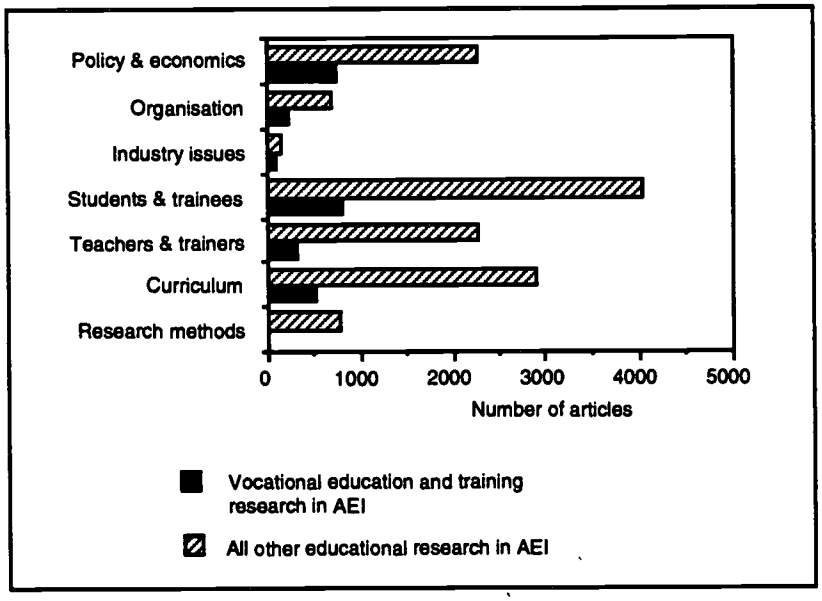

Figure 3.3
Research articles in AEI database since 1979 [27]

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). Figure 3.3 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.

Information on vocational education and training research projects conducted in 1991-92, was obtained from three main sources: the VOCED database[28], Australian

27 See Appendix C for details

28 The VOCED database collects information on completed vocational education and training reports and projects in progress in Australia. It also includes information from the Asia-Pacific region through ILO. VOCED information is also sent to the Australian Education Index (AEI). It is managed by the National Centre for Vocational Education Research.

universities, and the major government research funding agencies. Tables 3.2 and 3.3 give an overview of recent research in the seven categories of vocational education and training research.

Table 3.2
Research projects in progress
(planned for completion in the 1991–92 financial year)
listed in the VOCED database

Research category	Number of projects	Budget $'000
Policy and economics	0	nil
Organisation	6	208
Industry issues	5	268
Students and trainees	5	175
Teachers and trainers	2	67
Curriculum development and delivery	12	613 [29]
Research	1	18
TOTAL	31 [30]	1,349

It should be noted that none of the sources represented by each table provides anywhere near a complete picture of Australian research in the field. In fact, when the lists of projects are compared, there is almost no overlap between the three tables (see Appendix C). This suggests that significant areas of vocational education and training research are not being captured by the VOCED database. Our interviews indicated that the National Clearinghouse staff find it difficult to obtain project information from all vocational education and training agencies. An enhancement of the VOCED database, as suggested in the previous section, could provide both useful information on research and development expenditure and a comprehensive database of all of Australia's research and development output in vocational education and training.

29 Budgets for the 5 Competency Based Training Secretariat projects could not be obtained.

30 There were 31 research projects and 125 projects in the VOCED database completed in 1991-92. The VOCED database actually lists many more projects than this as "projects in progress", but in order to obtain an accurate one-year cross section projects are excluded which were not described as "completed" in the financial year 1991-92.
Most of the 125 projects in the database were curriculum development projects.

TABLE 3.3
Vocational education and training research thesis higher degrees being undertaken in 1992 in Australian universities [31]

Research category	Number
Policy and economics	0
Organisation	10
Industry issues	2
Students and trainees	3
Teachers and trainers	4
Curriculum development and delivery	36
Research	0
TOTAL	55

3.3 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:

a. that current research is fragmented;

b. that there is little fundamental and general-issues-based research in vocational education and training;

c. that the big issues in vocational education and training need much more intensive research;

d. that there is no strong critique of vocational education and training policies and programs.

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 from 1987 to 1992; most research topics had five or fewer publications in the AEI and VOCED databases.

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.

31 As provided by the Deans of Education, Business, Commerce and related faculties.

A peculiarly Australian feature which contributes to fragmentation is the geographical spread of researchers and their location in a diverse group of organisational types. Vocational education and training researchers are mainly located in the State and Territory capital cities, but some are based in regional cities such as Geelong, Lismore and Wagga Wagga. As mentioned in Chapter 1, the main organisations having researchers into vocational education and training 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, government departments and employer and union bodies.

Those involved generally believe that the communication between and within these groups is 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 among researchers.

Each of these is discussed elsewhere in this report.

b. Relatively little fundamental and general issues based research

The general perception of practitioners and policy makers is that there is relatively little research on the more fundamental and general issues in vocational education and training conducted in Australia.

Although significant advances are being made in researching general issues (see following sections) overall the research burden is being carried by a small number of people. 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.

A related problem is the lack of utilisation of the research that has been carried out. A recent paper[32] has pointed out that the lack of use of research is even more of a problem than the small amount of research, and has suggested that there is a need to reapply the outcomes of good research conducted in the past to current issues of concern, although this will often require the adaptation of terms into today's language.

32 Stevenson, J. (1992)

There is also potential to apply some fundamental research in other fields and disciplines to vocational education and training concerns.

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." [33]

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.

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33 Burke, J.W. (1989)

3.4 OVERVIEW OF CURRENT RESEARCH

This overview of current research in vocational education and training is divided into the seven areas described in Table 3.1. The focus is on current research and development, and so the overview below is generally restricted to work reported in the VOCED and AEI databases in the last five years.

a. Policy and economics

This category includes research in government and industry policy, economic and financial issues, and labour market issues.

There has been little study of Australia's vocational education and training policy. It is surprising that in recent years, during a period when there have been dramatic developments in vocational education and training, the study of this policy has received very little attention.

There are virtually no studies which examine vocational education and training policy from an historical or philosophical perspective. A recent book of essays on post-compulsory education (Poole 1992) is the exception. It contains interesting insights into post-compulsory schooling but little actual research on the processes and curriculum of the area. It also concentrates on the education of youth while the majority of participants in vocational education and training are adults.

Few studies examine the effectiveness of particular policies. Exceptions are the evaluations of the effectiveness of a variety of labour market programs introduced by Commonwealth Governments over recent years, such as *YES* and *Get Skilled*. Typical studies are those undertaken by the former NSW TAFE Surveys section (Thorn & Chapman 1988; Chapman & Clarke 1989).

Undoubtedly the greatest amount of research has examined the changes occurring in Australia's labour market(s), including the youth labour market. Here, State TAFE/Employment Departments have undertaken research examining changes in the need for labour in particular industries, occupations and/or regions and discussing the implications for planning in vocational education and training. The South Australian Department of TAFE has been very active in this area over the last few years. They have undertaken studies of the Youth Labour Market (1989), Unemployment(1988), Changes in employment in Adelaide (1989), Meeting the Challenges of the 1990s (1989), Horticulture (1991), and a recent series of 20 discussion papers on labour market and economic factors affecting vocational education and training (1991). Sweet et al. (1989) have also undertaken studies of the labour market and its implications for TAFE in NSW, and Sweet's own work in this area over many years is well known.

Whilst there have been one or two studies of the impact of award restructuring on training there has been very little systematic study of government policies on industry and industrial relations and their impact on vocational education and training, nor on the relationship between macroeconomic policies and vocational education and training. One of the important areas that has received very little study is the relationship between vocational education and training and productivity, though such studies are notoriously difficult to undertake.

The impact of vocational education and training policy on equity issues has not been investigated to any major extent. However, a number of significant studies have been commissioned under the National Plan of Action for Women in TAFE program. Examples include the studies by Robinson and Mageean (1992). There also appears to be a number of studies emerging on the impact of the NTB's competency framework and award restructuring on the role of women in society (Haines 1989, Reich 1992).

The social impact of current vocational education and training policies urgently needs investigation; for example, the effect of the decline of apprenticeship on families and the wider social structures.

Despite governments' commitment to Aboriginal education, little research has been done on the effectiveness of vocational education and training policies for Aboriginal Australians. One of the few studies is that of Mageean (1989) on rural Aboriginal women's access to tertiary education.

On the current policy agenda, particularly the desirability, cost effectiveness and feasibility of competency-based education, little research has been done. A recent study of the implications of competency-based training for facilities in TAFE (NSW TAFE 1992) provides evidence on its likely costs. Similar studies need to be undertaken for industry training. There are no known studies comparing the variety of methods for delivering competency-based training or for assessing it, though as regards the latter some speculative articles have appeared.

Overall we know very little about the factors that drive vocational education and training policy, its intellectual basis, its relationship with other government policy, and how effectively it achieves its aims.

b. Organisation

This category includes vocational education and training structures and systems; management and administration; state and territory differences in organisation; private and public provision; accreditation of courses; credit transfer, recognition of prior learning and recognition of training; links between sectors of education and training; buildings, facilities and equipment; and performance indicators and quality of provision. We have limited this overview to research on these topics reported in the VOCED and AEI databases in the last five years.

There were very few studies on vocational education and training structures and systems recorded in the VOCED and AEI databases. There was one significant national study by Durham and Jackson (1991), and the Victorian Pathways Project has recently been published (Deveson 1992). The Durham and Jackson study also compares the administrative arrangements for TAFE and training of the states and territories.

A few reports on management and administration of TAFE were included in VOCED. These were specific to state TAFE systems (namely NSW, Qld, SA and WA) or TAFE colleges. A UNESCO study (Hayton and Loveder 1989) examined the administrative and educational application of computers in vocational education, using South Australian TAFE as a case study. We expect that many more studies of vocational education and training management and administration are conducted but are not published and not included in VOCED or AEI. (An example of an important study

which was published but not included in VOCED or AEI is the Scott report (1989) on the restructuring of NSW TAFE.)

Publications on course accreditation appeared in the VOCED database for three states: NSW, Queensland and SA. However, these were procedural manuals and no research studies on any aspect of this topic appeared in the database.

For credit transfer, recognition of prior learning (RPL) and recognition of training, the situation is quite different, with a reasonable number of studies appearing recently in VOCED. Notable recent studies include the Broadmeadows TAFE/Ford project on RPL, and the Ashenden report (NBEET 1991) on recognition of training.

There have been some descriptive studies of links between sectors of education, but none appear in the database in the last four years. Important national studies conducted earlier are those of Jones and Krzemionka (1986) covering school-TAFE cooperative programs, and Parkinson (1985) covering articulation between TAFE and higher education programs.

The area of TAFE facilities, buildings and equipment has received much research attention in recent years. This area appears to be more researched than any other area in the *organisation* category. Several studies have been undertaken by NSW TAFE and SA TAFE. Issues that have been researched recently include the effect of the introduction of competency based training on facilities required, facilities required for open learning, multi-use facilities, and measurement of the utilisation of facilities.

The remaining area in this category is performance indicators and quality of training. This appears to have become an area of research interest in recent years, with a few studies being conducted by state TAFE systems. The earlier studies were conceptual (for example, Guthrie 1988), but some empirical studies on particular indicators of performance, such as client satisfaction (see Hayton et al. 1991), have been undertaken more recently.

c. Industry Issues

In this category we surveyed Australian research covering needs analysis, skills analysis and skills audits; industry trends and skill requirements; workplace language, literacy and maths; links between industry, TAFE, schools and universities; relationship between training and productivity. The search of the AEI and VOCED databases showed relatively little research has been published in Australia in this area, with only 38 publications in these databases over the period 1987–91.

Needs analysis and skills analysis research is mostly specific to a particular enterprise, industry sector and/or geographic area, and few reports of such projects are published. Those that have been published generally are limited to immediate and specific needs. However, there are a very small number of published reports on industry trends and skill requirements which draw on the international literature and are of longer term interest. Examples of this research in Australia are:

- Ford (1987, 1990): compares work organisation and skill formation practices of enterprises in Australia and overseas countries;
- Chataway (1991): analyses recent industry trends and the implications for TAFE, with reference to case studies from the textiles and metals industries;

- Hayton and Harun (1988): analyse industry trends and skill requirements in manufacturing;
- Littler (1991): reviews Australian and overseas literature on industry trends and skill requirements;
- Labour Market Analysis Branch, DETAFE, South Australia (1991-92): this is a series of articles which describe the emergence of the post-industrial economy, and analyses industry trends and changes in employment by industry sector;

Compared with other areas within the industry issues category, there is a reasonable amount of research conducted recently in the area of workplace language, literacy and maths. A good cross-section of research articles and other publications on workplace literacy were found in the AEI and VOCED databases. In part this could be attributed to the increased level of funding for research and development projects in 1990 for the International Literacy Year. Researchers appear to be distributed widely over a number of organisations, but mainly they are within state vocational education agencies and universities.

Within the field of vocational education and training, there are very few research articles on the links between industry and TAFE, schools and universities. Two recent projects which used descriptive surveys and case studies are those of Hall (1991) and Anderson (1992). The area is largely unresearched, with very little published data, even of the low-level descriptive type.

The relationship between training and productivity is an issue which has received much attention recently in Australia and overseas. Remarkably however, there appears to be very little research in Australia on any aspects of this issue. Not a single research article on this issue was found in the AEI and VOCED databases in the last five years. Despite this, the work of Bill Ford is well known and he has written studies in recent years which include an examination of the relationship between training and productivity.

Overall, the *industry issues* category appears to have relatively little research activity. There is a moderate amount of research on workplace literacy and a little on industry skill trends. The remaining areas in this category attract little or no research in Australia.

d. Students and trainees

Research on students and trainees includes profiles of various groups, access issues, career paths, destination studies and occupational identity. A search of the literature in the AEI and VOCED databases produced a large number of published studies covering these topics. However, examination of the studies revealed that most do not have students and trainees as their main focus. This overview refers to studies with students and trainees as their main focus.

Research studies in Australia on profiles and destinations of groups of TAFE students have appeared frequently in all of the years surveyed. The studies usually have been limited to a particular group in a single state or territory. The groups that have been researched include: participation and equity program (PEP) students; Australian Traineeship Scheme (ATS) trainees; students with a non-English speaking background (NESB); pre-vocational students; women students; rural women; the unemployed;

applicants for particular courses; intellectually and physically impaired; aborigines. No studies of students or trainees outside the formal education system were found in the AEI or VOCED databases.

The student profile and destination studies mostly used survey methods for collecting data. A few studies used case studies of individuals. It is interesting to note that no studies based on an analysis of the national collection of TAFE enrolment information, other than the annual publication 'Selected TAFE Statistics', have been reported in the databases. It appears that the national database of TAFE enrolment information, which was recently moved to the National Centre for Vocational Education Research in Adelaide, is a valuable research resource which is as yet largely untapped.

Many of the student profile and destination studies have included an analysis and discussion of access issues as the main theme. Most of the access studies have focussed on the access to TAFE of women, those of NESB, and the unemployed.

On the issue of student attrition in TAFE courses, only a few studies spread over many years have appeared. These studies mostly used large questionnaire surveys of student withdrawers and 'persistors'. The largest studies are those by McDonald (1984), Bath (1988), and Parkinson et al. (1988).

There are very few studies on career paths, occupational identity and student perceptions of vocational education and training. In recent years a small number of student destination surveys have been reported by TAFE agencies in NSW, QLD and SA. These studies normally also include surveys of student satisfaction with TAFE services. Significant studies on these issues include those by Hayton et al. (1991) on client satisfaction with TAFE services and Brunner (1990) on satisfaction with student services. The only known recent large study on student perceptions is on high school students' perceptions of TAFE by Chapman et al. (1992).

e. Teachers and trainers

This category includes the vocational education and training profession, competency standards for teachers and trainers, career paths for teachers and trainers, and trainer and TAFE teacher education. In this category, very little research has been reported in the VOCED and AEI databases in recent years.

Of the work that has been undertaken in this category, most has been descriptive research examining the professional development needs of teachers in particular fields, usually those that have been affected by technological change (e.g. automotive engineering). Even here, however, the work has not been of a sustained kind nor has it been methodologically sophisticated, and it would be difficult to generalise from it even in relation to the particular teaching fields with which it deals.

Allied to this, is the work on initial teacher education/training. Here, there have been a number of studies, most of which have concentrated on the competencies needed of TAFE teachers in the late 1980s and 1990s and their implications for TAFE teacher education programs. Most of these studies have relied largely on expert judgment for their data. These include the studies undertaken by the Victorian State Training Board in 1986 and the TAFE National Centre[34] in 1989-90. The TAFE National Centre study developed a number of models of TAFE teacher education. An important project

[34] The three main publications arising from this research are Hall et al. (1990 and 1991) and Scarfe (1990).

currently in this area is the national study being conducted by Ian Predl and Associates.

There is no known research on the nature of vocational teacher education and how it relates to teacher education more generally. There are no studies, for example, on the in-service model of teacher education and its advantages and disadvantages compared to traditional pre-service models. There are few studies on the distinctive nature of vocational teaching and none on how this might affect teacher training programs. As studies of the nature of expertise in the trades develop (following the work of Evans 1992) vocational teaching techniques will be affected and thus, presumably, research on vocational teacher training.

An area in which there has been some work which is both sustained and conceptually sound is in the area of career change for people entering TAFE teaching. Here the initial work of Butterworth and Gonczi on the problems facing beginning TAFE teachers (1984) has been supplemented by three studies by Mealya (1989-90) on the nature of trade teachers before entry into teaching and how they cope with the change. The work of Burke (1990) looks again at this topic from a sound conceptual basis developed in a PhD thesis.

We know very little about TAFE teachers or TAFE teaching. What teaching models TAFE teachers have is unknown, as is the question of how appropriate these models are to the changing nature of industry. How competent TAFE teachers are to respond to the "needs" of industry is unknown, at least partly because the needs of industry are not always clear. A recent study of the critical thinking skills of a small group of TAFE teachers by Hager and Kaye (1991) is one of the very few studies that have been done on the competencies of TAFE teachers but many more empirical studies of this kind need to be undertaken.

Little is known about the morale of TAFE teachers, their attitudes to their careers, their desire (or lack of) to improve their skills, nor how this skill development might best be done. Killen's 1990 study on decision making roles of teachers gives some insight of their perceptions of the systems in which they work,

If this is the case for TAFE teachers generally it is even more so for those in promotion positions. There are few studies of any kind on head teachers (see Mageean 1989) and few on TAFE college principals/directors. One example is Mageean's 1990 study researching the skill development needs and approaches for TAFE principals.

Research on industry trainers is even more sparse than that on TAFE teachers. The recent study of the competencies of workplace trainers undertaken by the National Centre (Thomson 1991) is the only recent study that we were able to identify, though there is a study currently being undertaken on trainer training in Australia (O'Brien 1991). Thus we know very little about the nature of the training profession in Australia: the backgrounds of trainers, how they got into training how long they stay, how they are trained (if at all), what training techniques are used and how appropriate these are, and so on. Of course, the fact that we know so little about the nature of learning in the workplace means that it will be difficult to undertake research on the effectiveness of trainers in the short term.

f. Curriculum development and delivery

This category includes teaching/learning issues, workplace learning, assessment, competency based training and assessment, modes of delivery, evaluation of courses, educational and training psychology, and training needs due to industry restructuring. Omitted from this overview are the many curriculum development projects listed in the VOCED database, as they are not within the scope of 'research and development' covered by this report (see definitions in section 1.4).

There has been a lot of work in this area, particularly at the development end of the research-development continuum. This is partly due to major initiatives to develop national TAFE curricula in many fields of study in the last decade. Many of these initiatives have been funded and monitored by the Australian Committee on TAFE Curriculum, on behalf of the Australian Conference of TAFE Directors, which in turn became the Australian Committee on Training Curriculum (ACTRAC).. Thus the area where most research has been done has been in curriculum development and implementation. There have been various studies on general methodologies for curriculum research and development, in which the work of Anderson and Jones (1986) at the TAFE National Centre for Research and Development has been prominent. In addition, several State and Territory TAFE bodies have made significant contributions to this topic. There are also the McBeath books (1986 and 1991) which analyse various case studies of curriculum change in TAFE.

There are various studies that investigate the changing training needs of selected industries or occupations. These are typically carried out by State and Territory TAFE bodies as the need for course revision becomes apparent or in order to inform development of a national curriculum. Some of these studies focus on the implications of new technology for an industry or occupation.

There are hardly any studies which systematically analyse and compare the effects of different methods of teaching and learning in vocational education and training. The major exception is the work of Stevenson and colleagues at Griffith University. (see, for example, Stevenson 1984, 1986, 1991). However, there are studies of the effectiveness of pilot projects of various innovative delivery mechanisms for courses. These include open learning (particularly in Western Australia), self-paced learning, problem-based learning, computer managed learning and computer assisted learning. There are also two UNESCO monographs[35] on applying computers to the teaching and learning process in Australian technical and vocational education.

Not surprisingly competency-based standards and competency-based training have caught the attention of researchers recently. There are various research publications commissioned by the National Training Board and the National Office of Overseas Skills Recognition on establishing and assessing competency standards.[36] There are several policy and discussion papers on the implementation of competency-based training produced by the TAFE National Centre for Research and Development and various State and Territory TAFE bodies. Thomson and others (1991) have surveyed the extent of implementation of competency-based training in Australian vocational education and training systems, and ongoing monitoring of this is in place. Rein

35 The UNESCO monographs are Lichenstein & Montgomery (1985) and Hayton and Loveder (1989).

36 See for example Gonczi, Hager and Oliver (1990).

(1992) has published a case study of the implementation of competency-based training in tourism and hospitality in Australia. However, there appear to be no studies that demonstrate the value of competency-based training over other alternatives. So far there appears to have been little significant research in the related area of recognition of prior learning.

The effects of industry restructuring on vocational education and training systems has received some research attention, particularly at the level of general policy and principles. The TAFE National Centre for Research and Development has been prominent here. A reasonable number of detailed case studies in this area have been published only recently.[37]

Areas in which little research and development appears to have occurred include workplace learning, experiential learning, instructional design, educational and training psychology and evaluation of courses.

g. Research methods

This category includes research methodology, evaluation methodology and approaches to curriculum development in vocational education and training. In this survey we excluded publications on research and development methods that were not notionally specific to vocational education and training, and we excluded research studies in which a description of the research methods used was secondary to the description of a piece of research.

With these exclusions, very few studies on research and development methods were found in the AEI and VOCED databases, and this category contained the fewest number of studies of all seven categories. In the VOCED database only 23 studies published over the last ten years were found. These are listed in the following table.

Table 3.4:
Studies of research and development methods in the VOCED database in the last ten years

	Research methodology	Evaluation methodology	Curriculum development approaches
Descriptions of current practices and future trends	Rumsey (1983) Butterworth & Rustomji (1985)	Naylor (1985)	Broderick (1982) Kuhl & McCarthy (1982) Bone & Guthrie (1990)

37 See for example Hayton and Loveder (1992) and Curtain (1991).

Guide to methods and analysis of methodologies	Anderson & Jones (1986) Butterworth & Grannall (1986) Hodgkins & Coatney (1986) Hermann (1987) Hayton et al. (1988) Grannall (1989) Hayes & Hayton (1989) Hall (1990) Hayton & Loveder (1992)	Bell (1982) Thomson & Byme (1984) White (1987) Lawrence & Collin (1991)	Hodgkins & Coatney (1986) McBeath & Richards (1987) Guthrie et al. (1989) Mealya (1989)

There were twelve studies of research methodology. These mainly covered occupational analysis, needs analysis and analysis of vocational skills. Few of the studies provided an in depth analysis of methodologies or comprehensive comparisons of methodologies. Two of the widely used and comprehensive studies are Anderson and Jones (1986) and Hayton et al. (1988).

There were only five studies of evaluation methodology. The scarcity of studies could be explained by the lack of interest in developing evaluation methodologies that are specific to vocational education and training. It is also suspected that some of the evaluation methods being used in vocational education and training are recorded in manuals which have not been published.

In view of the large number of curriculum development projects being undertaken at national, state/territory and local level, it is surprising that very little is published on the methods of curriculum development. Only seven studies were found in VOCED published in the last ten years. It is likely that there are many manuals which have not been published in use by institutions.

3.5 RESEARCH NEEDS

The project asked those interviewed to identify Australia's vocational education and training research needs over the next five years. Information collected from the search conference, interviews and submissions suggests that the topics listed in Table 3.5 are widely perceived as needing research over the next five years.

Table 3.5
Research needs in vocational education and training

Policy and Economics	Priority area: The economic benefits of vocational education and training — both at the micro and macro level, including the relationship between education and the economy and the training agenda Topics: • the social context of learning • economic analysis and econometric modelling, especially for resource allocation and the tying together of labour force developments and training • extent to which there is a training market • studies which anticipate important changes in the socio/cultural and technological spheres
Organisation	Priority area: Management in TAFE systems — in particular, the assessment of various approaches to corporate management Topics: • Models and methodologies for cross-sector accreditation (national system) • Recognition of prior learning • Market perceptions of qualifications • Connections between industry and vocational education and training arrangements
Industry Issues	Priority areas: Links between training and productivity, including the interdependence of training, organisational development, business vision, and productivity The place of language, literacy and maths in workplace reform and training Topics: • Training as a means of furthering organisational development • The role of training in workplace reform • Involvement of employers in workplace assessment • Problems specific to small organisations • Retraining; education/training and occupational choice • Language, literacy and maths in the workplace • Gender segmentation in the workforce; the impact of structural change and competency based training on women's employment • Collaborative and cooperative models of training for industry and providers • Approaches to developing a workforce that is responsive to the marketplace • The nature of interpersonal skills and their contribution to the workplace • Core competencies required in industries

Students and Trainees	Priority area: Community perceptions of vocational education and training and how these are formed Topics: • Vocational education and training; needs of disadvantaged groups • Characteristics of students/trainees and the impact of policy on participation (e.g. fees) • Equity policy, the future of the disadvantaged inside and outside the workplace and in the continuum of educational settings • Attitudinal research — why and how do people choose careers and providers
Teachers and Trainers	Topics: • Practitioners as researchers • TAFE teacher competencies: relative importance of teaching competencies and technical content competencies • Teacher and trainer education • How knowledge is used by teachers and trainers
Curriculum Development and Delivery	Priority area: The assumptions underlying competency based education/training, ways of implementing CBT, the nature of competency based assessment, and the implications for post secondary sector and workplace training of the implementation of the Mayer report and the Carmichael reforms. Topics: • Learning settings, processes and outcomes • Modes of delivery x cost benefit x gender x background • CBT assessment and competency standards, assessment of higher order competencies • Relationship between competency standards and underpinning knowledge and skills • Enterprise-specific competency standards and their relationship to occupation-wide and industry-wide standards • The nature of workplace learning • Innovative approaches to skill formation at the workplace • Relating program design to National Training Board frameworks • Rigorous analysis of current vocational education curriculum and the assumptions which underlie it • Responsibility for middle-level training

Research methods	Priority area: Approaches to the dissemination and use of research in vocational education and training Topics: • A national register of all research — publicly funded; privately funded; unfunded • Collaborative and cooperative research methodologies. • Methodologies for the continuum of research • Comparative studies • National and international networks • Bridging the gap between research and practice

In our view, given the criteria for setting priorities identified in section 2.5 (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 and training, ways of implementing competency-based training, the nature of competency-based assessment and the implications for the post-secondary sector and training of the implementation of the Finn[38], Mayer[39] and Carmichael[40] reforms;
- the nature of workplace learning. There has been little conceptual work in this area and virtually no empirical work on which further studies can build. A related area on which work is needed is the place of language, literacy and maths in workplace reform and training. Clearly these areas are of great importance in the national economic agenda and are areas in which an enormous expenditure is occurring;
- management in 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 fundamental, agenda-setting research which can set priorities for more applied and issues-based studies. In some areas, particularly on students and trainees, research is now more feasible due to the development of national statistics by the NCVER.

38 Finn, B. (1991)

39 Mayer, E. (1992)

40 Carmichael, Laurie (1992)

CHAPTER 4
THE ORGANISATION AND FUNDING OF RESEARCH

4.1 GOALS OF A RESEARCH AND DEVELOPMENT STRATEGY

The need to increase both the quantity and quality of vocational education and training research in Australia received virtually unanimous support in data collected for this project. A consistent view was that the implementation of the national agenda for workplace reform and vocational education and training reform will need to be informed by solid research to ensure its long term viability and success.

Section 2.3 outlines the principles that need to underlie the proposed R&D strategy. In addition to the establishment of a research and development plan (described in chapter 2), these principles lead to the following goals for the organisation and funding of research:

a. fostering the quality and increasing the quantity of research;

b. fostering collaboration between industry-based, TAFE and university researchers

c. coordination of research and development;

d. training of researchers;

e. developing an appreciation of research; and

f. disseminating the results of research in a way that effectively links it to policy and practice (discussed in chapter 5).

These five concerns are addressed below.

a. Quality and quantity of research

Much of the past research in the sector, although sometimes performing a useful role, has been of the 'quick look' variety, described in one submission as:

> "... often unsound methodologically, and undertaken by staff for whom research is only a subsidiary role in their broad range of duties. Many of them have come to research indirectly and for them, research was not the primary focus of their training."[41]

On the other hand there has been a number of research and development projects carried out over the last few years which are both of high quality and of practical use. The challenge is to increase this considerably.

A national strategy should achieve the following:

41 From the submission of the TAFE Commission of NSW, p.5.

- the amount of vocational education and training research being significantly increased, partly by attracting competent higher education researchers from other relevant fields into vocational education and training research, to establish a base of independent researchers.
- vocational education and training research being more solidly grounded in theoretical research than previously.
- critical analysis of vocational education and training policies by independent researchers, and the introduction of new ideas.
- involvement of staff with research expertise from universities, TAFE and industry, to ensure that research choices are sensitive to overriding concerns of vocational education and training policy makers and practitioners while still retaining a focus on broader issues and concerns.
- ensuring that there is a critical mass of researchers in at several locations, to provide a base for high-quality and relevant research.
- the use of multi- or interdisciplinary teams to address certain key issues. (For some research problems, interdisciplinary teams are crucial due to the nature of vocational education and training which is not itself a discipline, but rather a field which draws on a range of disciplines. Interdisciplinary research will be an important element in any strategy.)[42]

b. Collaboration between industry-based, TAFE and university researchers

Earlier in this report we have emphasised the need for collaboration between industry and TAFE and university researchers. The benefits of this collaboration are improved relevance of TAFE-based and university-based research to industry needs, the optimum use of expertise, and effective utilisation of research results. A proposed structure to achieve this is outlined in section 4.3.

c. Coordination of research and development

In Chapter 1, three categories of research were outlined. These are applied research carried out by groups such as TAFE and industry bodies for their own purposes; applied research into general vocational education and training issues, and fundamental research, which is carried out largely in universities funded by ARC grants, internal university research grants, and so on. So far much research in these three categories has been sporadic and uncoordinated and has not had a major impact on development (although the situation of client-based research has recently improved due to the establishment of the committees mentioned in 2.3).

Any national strategy needs to improve this state of affairs — in particular, there is the potential to develop a clear national research program in general-issues-based

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42 Specialist research organisations such as the Rand Corporation in the USA have had some success with interdisciplinary teams. An alternative strategy is to have a strong research coordinator who manages an interdisciplinary team in which each expert works more or less independently, such as occurs at the Institute on Education and the Economy at Columbia University, New York.
While such teams do not always succeed, it has been found that they frequently do, and prove very valuable to all concerned. The potential for success in Australia is even greater in the United States, as Australian university reward structures do not discourage collaborative and interdisciplinary work to the same extent as in the US.

research. The collaboration between TAFE, industry and the universities which is a necessary part of any national strategy will ensure that some research in client-based research feeds into this. Problems uncovered in such research could, in turn, suggest appropriate areas needing fundamental research which could be carried out be the experienced researchers, as discussed above, that we hope might be attracted into the field, with ARC funding.

The overall result of these interconnections should be a more coherent vocational education and training research effort in Australia.

d. Training of researchers

The training of researchers in vocational education and training is in many ways similar to their role in developing researchers in any of the social sciences, with three notable differences.

Firstly, most research students in most disciplines fit their work into a research tradition and research paradigms which are relatively well developed. This is not the case for vocational education and training.

Secondly, there is a dearth of female researchers in vocational education and training; this needs to be remedied not just on equity grounds but because of the interests and perspectives that women will bring to the field.

Thirdly, there is a tradition of most university research students being at the beginning of their careers, often following straight on from first degree to research degree studies. This is not the case with the practitioners likely to undertake research degrees in vocational education and training.

The following initiatives would encourage the training of vocational education and training researchers:

- The development of special courses at postgraduate level for TAFE staff and industry trainers to develop skills of research and help them to choose relevant research topics. There is no suggestion that the research should merely shore up the assumptions of policy makers, but the topics chosen should elucidate important issues. This will require a good deal of coordination and formal liaison between the universities and the TAFE systems, ITABs and other peak organisations.[43]
- Enable interested and appropriately experienced teachers to undertake an 'apprenticeship' — again, focussing on a topic of relevance to the teacher's employer — with an experienced university researcher. The salary of such people would be shared in some way by the vocational education and training systems or private organisations, unions, peak bodies and the universities.
- TAFE systems could facilitate the above by including as desirable criteria for promotion to advanced skills teacher (and similar categories) the

43 One example of such a course is the Master of Education (Adult Education) run by the University of Technology, Sydney (UTS) in close association with TAFE NSW. The TAFE staff who enrol in the course have been carefully chosen and, in addition to course work, undertake a research project which has been identified by TAFE NSW itself as important. Students are jointly supervised by TAFE NSW and UTS staff.

demonstrated capacity to undertake (or, at the least, interpret) research and the demonstrated ability to apply research findings in teaching practice.

- TAFE systems (or any national coordinating body) should also facilitate the above by providing incentives, including scholarships, to enable TAFE teachers and trainers at every level to undertake appropriate research and post-graduate degrees. Supplements to the normal postgraduate scholarships should be provided to a limited number of staff, to enable them to undertake such training on a full-time basis.

e. Development of an appreciation of research

One of the facts that became obvious in the course of this project was that, to large numbers of practitioners and policy-makers in vocational education and training, research and development are largely irrelevant. Most TAFE teachers, trainers and curriculum developers are not antipathetic to research; rather, they are often unaware of how to access it and the contributions that it can make to their own aims as educators. In terms of policy, there are some (but relatively few) examples of policy changes influenced by research, and there are some in senior positions who doubt the extent to which research can contribute to policy development.

Major changes in attitude are necessary at all levels of the sector. The implementation of a national strategy involving close links between researchers in TAFE, industry, the NCVER and universities, should help to enhance the appreciation of the value of research and development in vocational education and training. The dissemination initiatives and strategies proposed in the next chapter should, likewise, help to develop an appreciation of the value of research and its contribution to development.

However, without a change in the mindset of many researchers, there is a danger that some of the errors of general educational research may be repeated. Whatever structure is chosen, two developments need to be fostered in any funded applied research:

- It is noteworthy that R&D in primary industries (e.g. mining, cattle, wheat) is much more highly valued by the ultimate stakeholders (primary producers) than is R&D in vocational education and training — or in education generally. The same comment applies to the value of medical research and development as perceived by medical practitioners. In these cases, there is a much stronger link between researchers and practitioners: researchers in any of the primary industries do much work in the field, and medical researchers have strong links with teaching hospitals. The analogy would be that research in vocational education and training needs to be strongly linked to the situations (in TAFE or in industry) to which it is relevant.

- Bids for applied research projects need to be required to include dissemination and/or development strategies. This will mean, at the very least, an acknowledgment of the need for effective dissemination; however it will often mean a slightly different composition of research teams, or a dual approach in which different individuals or groups take responsibility for the dissemination or development phase.

If these changes are made there is more of a chance that the right questions will be asked, and the ultimate users will see the benefits of research, and so develop an appreciation of its value.

4.2 CONTRIBUTORS TO VOCATIONAL EDUCATION AND TRAINING RESEARCH

a. National Centre for Vocational Education Research

The role of the National Centre for Vocational Education Research in the national research and development strategy was a key issue raised by some interviewees in the data collection phase of this project. There was wide agreement that the NCVER will and should continue to play a major role in vocational education and training research. Some saw the need for the NCVER to expand its dissemination activities, and enhance some already existing. Given the significant growth in the research into vocational education and training as proposed in this report, we see the NCVER's expansion of dissemination as vital to the strategy's overall success.

It is also suggested that the NCVER should take up many of the increased opportunities for collaborative research with universities and TAFE agencies that will accompany the expanded research effort, by means of close collaboration with research teams established in the partnerships described in section 4.3.

The enhancement of the NCVER's dissemination role should involve a broad range of activities and be based on more than just a linear model of dissemination. The NCVER's present wide range of dissemination activities indicates that it is already going beyond a purely linear approach to dissemination. Suggestions on activities to achieve the NCVER's enhanced dissemination role are discussed in Chapter 5.

b. Universities

One important strategy for increasing the quality and quantity of research and development is to secure the participation of experienced university researchers from relevant disciplinary areas. These experienced researchers are located in faculties and departments such as education (vocational, adult and general), economics, management, sociology, psychology, etc. and represent a pool of research ability that has so far had little or no incentive to be involved in vocational education and training research and development. Researchers are also to be found in university centres associated with the National Languages and Literacy Institute of Australia. Not only do such researchers have the kind of experience and research know-how that is required, they also bring the conceptual and discipline strengths that are needed for applied research on general issues and fundamental research. As well, they would bring the critical stance that academics can take, and help to achieve the mass of researchers needed for a research agenda to be pursued effectively. The new high profile of vocational education and training research represented by the establishment of a body such as the proposed national Research Consortium (see 4.4) would help serve to attract appropriate experienced researchers.

One obvious barrier to the participation of experienced university researchers in vocational education and training research and development is the perceived dichotomy between vocational and general education. As a result of this perception, vocational education and training have been seen as 'less than respectable' in the past. However there are signs that the dichotomy is collapsing under the impact of factors

such as technological change and government policy. If this is so, more university staff will become aware of the worth of research in the vocational education and training area.

Roles of the newer universities

In addition to the above, the amount of vocational education and training research and development will be increased further by the contributions of those staff from the previous College of Advanced Education sector who specialised in the training of TAFE teachers, and who are now in a university environment that encourages research. Many of them are contributing significantly already. With some targeted funding, development of those existing staff who do not have a background in research, appropriate future staff appointments, and an increasing postgraduate enrolment, many more could do so.

There are already some signals of a high level of commitment to vocational education and training in such universities, by the creation of two Chairs of Adult Education at the University of Technology, Sydney, and one in Post-Compulsory Education at Griffith University. However, a severe limitation is the absence of funding for research infrastructure in vocational education and training in these universities. This is discussed in section 4.6.

Restrictions on universities

One problem to be faced is that there are currently severe practical barriers to the involvement of university researchers in much contracted research. The main difficulty is that it is almost always expected to be completed in a very short time frame, which excludes almost all university staff due to teaching and other commitments. However, if some of the suggestions made later in relation to university research are implemented, then there is a greater possibility of competition in this area of research, provided that the awarding authorities are genuinely open with their selection procedures. Doubt has been expressed about this in a number of quarters.

c. TAFE systems

Almost every person interviewed regretted the fact that the research capacity of the TAFE systems had been run down. It was pointed out by a wide range of people that there was a need for focused short-term research, particularly of the basic evaluative and data-gathering types which help policy makers.

Two other criticisms were that the quality of the research in the past has not always been of the highest order, and that there needed to be a stronger connection between the research and development sections within the different TAFE systems. These are both likely to be remedied by the connections to be made in the partnership arrangements, and with the support that a Consortium could offer to individual researchers.

Research being carried out by VETEC in Queensland, such as the impact of industrial placement legislation and reviewing the ITABs, are examples of research projects that are highly appropriate and necessary for forming the basis of rational decision making.

The precise number of researchers needed by the TAFE systems is a matter of conjecture, but the need is very real, since research programs have been run down over recent years while enormous changes in the TAFE systems have been set in train.

d. TAFE teachers

One of the most persistent themes to emerge from the data was the need to create a culture in the TAFE systems generally, and amongst the teachers in particular, which values research. The need for teachers to be receptive to research findings and to understand them was felt to be essential to the future of the TAFE systems. There were a number of suggestions about how this culture could be developed. Foremost amongst them was that teachers needed to be involved in undertaking their own action research projects. It was widely felt that even if this was not to produce high quality research in its own right, it would sensitise teachers to the value of research.

There is, however, among those in TAFE systems, a polarisation of views on the value of committing funds and energy to action research. One view is that it was absolutely essential that teachers engage in action research, that it was an end in itself, and that the whole teaching/learning process depended for its success on the undertaking of small scale research leading to personal reflection on practice. On the other hand the view was put that action research was potentially dangerous as it diverted funds and effort from the more important fundamental and applied research which provided a rational basis for decision making and educational practice. Further, it was implied that in some circumstances action research has become part of an ideological agenda which leads to the rejection of research which uses quantitative methods or even generalises results. While the criticism that action research is not usually of a very high quality certainly has some validity, there are ways of ensuring that action research is subjected to review and quality control.

It was also suggested that College Principals should have the encouragement and support of research as a part of their duties. Others suggested that projects should be undertaken in association with university researchers, using an apprenticeship model, with a limited number of projects, and researchers being restricted in numbers, at least in the first instance.

The clear majority favoured the involvement of teachers in action research but pointed out that there was a need to provide incentives for undertaking it. The suggestion that promotion criteria for various positions include the need to be able to undertake research was widely supported.

It is obviously unrealistic to expect the majority of TAFE teachers to become researchers. That there is a strong feeling in higher education circles that not all university lecturers should undertake research underscores this point. Few things would be more detrimental to the aim of increasing the quantity and quality of vocational education and training research than the encouragement of large scale unsupervised action research by inexperienced teacher/researchers.

We favour a three pronged approach:

- In the first instance, selected teachers should be encouraged to undertake action research in association with experienced researchers from within the TAFE system and/or with university researchers. It would be desirable

that this be done in association with the undertaking of a postgraduate qualification, though this need not necessarily be the case.

- Second a number of teachers would be selected to undertake an apprenticeship with experienced researchers and work with them on larger scale projects (funded or unfunded).
- Third, the teachers in the previous two categories would gradually work with a larger number of teachers and, over time, develop each system's capacity to undertake quality action research.

It will also be necessary for such action research to be seen as a legitimate alternative activity to teaching (due to the awards under which TAFE teachers work, in which a number of hours per week of teaching is specified), and for compensating funds to come from central sources, so that the involvement of teachers in action research is not at a direct cost to their own College.

e. Industries and industry bodies

In the course of gathering data for this report, two problems related to industry involvement arose. Firstly, it proved very difficult to obtain any comments from any representatives of 'industry': calls for submissions, follow-up, invitations to attend meetings, and personal phone calls, all resulted in only a handful of replies. Secondly, very few of the interviewees or submissions seriously advanced the possibility of significant industry based research undertaken by industry trainers. Clearly it is desirable that this occur, but only if the same considerations outlined in relation to TAFE teachers were observed. We would favour the same sort of arrangements outlined immediately above, although given the experience of this project we are doubtful whether it is realistic to expect major involvement.

Industry does support training research and development through the various Industry Training Advisory Bodies (ITABs) at national and at State/Territory level. The ITABs provide a model of industry-supported R&D on an industry sector basis. The funding of each ITAB and its R&D projects generally comes from DEET and the enterprises in the relevant industry sector. ITABs commission research projects such as labour market analyses, and development projects such as the development of competency standards, and training course design. The extent of industry support and the role of the ITABs varies greatly from industry to industry.

The industry–TAFE collaborative projects,[44] which have been partly supported by the Employment and Skills Formation Council, provide a useful demonstration of industry-based research and development. An example of a project in which the R&D was primarily industry-based is the Mitsubishi–Noarlunga TAFE College research project on semi-autonomous work teams.

The collaborative research model recently initiated by the ARC is a useful model for developing this research. If there were a fund for vocational education and training research then a proportion should be set aside for industry/higher education research, or for industry/TAFE/higher education coalitions. Unfortunately there are still very few researchers who are involved in examining learning in the workplace, and the

44 Employment and Skills Formation Council (1992)

development of coalitions depends in the first instance on the development of the research capacity in universities.

Another example of industry involvement in R&D is the work being done by consultants attached to the Centre for Best Practice (formerly the Workplace Resource Centres). Key features of this are the close links that the Centre has developed with government, union and employer groups, and the consultative approach it takes to workplace reform projects.

f. The wider pool of researchers

The field of vocational education and training is unusual in that there is a significant number of researchers undertaking quality research and development outside the major TAFE and university institutions. A prominent example is the work of the Dusseldorp Skills Forum, but there are many other examples across Australia of those who have made, and continue to make, a considerable contribution to research on vocational education and training. Although the research undertaken will mostly (but not always) be limited to short term policy research, it is important that ways be found to ensure that such expertise is drawn upon in any structures that are developed.

The pool of researchers could become even wider with some interest in vocational education being taken by Departments of School Education, as evidenced by some recent cross-sectoral R&D projects.

4.3 FOSTERING RESEARCH BY INDUSTRY-TAFE-UNIVERSITY PARTNERSHIPS

As suggested in chapter 2 (on priority setting), there will be considerable benefits to what we have described as 'applied research' if groups of researchers and practitioners can be formed to combine the perspectives and the research strengths of the different bodies,

The possibilities are for such groups to be:

- locally-based
- industry-based
- based on a varied approach.

Local partnerships

There is considerable advantage in local partnerships: the necessary connections which would facilitate the formation of such partnerships are, in many cases, in place already,[45] and there is a greater chance of more of the aims of a national strategy being met when communication between the parties is as easy as possible. The composition of the local partnerships could vary considerably. A example of a feasible composition is:

- a vocational education department of one university and an economics department of another;
- three major enterprises (a mixture of private and public sector);

45 An example is the recently-formed Joint Centre for Education and Work formed by DETAFE (South Australia) and the University of South Australia.

- a TAFE system, network, or major college
- an ITAB.

This arrangement would provide a strong motivation for researchers to research topics of relevance to industry; which is after all the base for up to 80% of the vocational training that takes place in Australia. It would also facilitate collaboration with those researchers outside universities, TAFE systems or industry bodies with highly-developed skills and experience in vocational education policy, TAFE system research and instructional design. Their involvement with other members of the partnership could be highly beneficial.[46]

Industry-based partnerships

The above model could be adapted so that the same mixture of organisations was involved, but with the partnership going beyond one city and focussing on one particular industry.

Other partnerships

Another approach that could be taken would be to allow for the possibility that partnerships might emerge which are based neither in one region or based on one industry. Such arrangements would need to be judged on their ability to achieve the aims of the national strategy.

4.4 A COORDINATED NATIONAL APPROACH FOR GENERAL-ISSUES-BASED R&D

One of the central tenets of this report is clearly that at this stage in the evolution of vocational education and training, a coordinated national approach is necessary to ensure the best returns possible on funds allocated to research. The various options are discussed below.

a. A single national organisation

In this model funds for applied research and development would be directed to a single separately-funded organisation. (This was the USA model for the 21 years up until 5 years ago, with the centre at Ohio State University.)

Advantages:

- Such a centre can form multidisciplinary teams relatively easily, although normally from within its own ranks.
- It will be particularly sensitive to the overriding concerns of policy makers and practitioners.

Limitations:

- A centre of this type tends to become self-contained and isolated from other researchers in the field. To judge from the experience of the Ohio centre, such a

46 This has some similarities to an approach described by Skilbeck (1985),who argued for "a situation where local groups, working collaboratively and within broad policy frameworks, themselves participate in the basic processes of research and development of the curriculum."

centre is likely not to have significant interaction with even the local university, and not to be connected with those undertaking more theoretical research, and for its research products not to have a lasting impact on theories about vocational education and training, or on subsequent research.

- Such an arrangement would provide little encouragement for experienced researchers from higher education, outside of the national centre, to engage in research in vocational education and training.
- Publications are likely to be produced without the rigorous scrutiny applied to refereed journal articles and monographs.
- A centre such as this runs the danger of becoming a government-funded advocate of the status quo and not very open to new ideas.
- 'Safe' research is likely to be favoured, rather than controversial research.
- A structure such as this reinforces the prejudice that vocational education and training is beneath the notice of universities. Research in vocational education and training must not be organised in ways that encourage a 'ghetto' mentality.

Example:

An Australian example of this model would be the National Centre for Vocational Education Research (NCVER) being enlarged and becoming the sole centre for funded applied research and development in Australia.

b. Several independent centres

A variant on the above model would be a series of separate and independent specially-funded research organisations for vocational education and training. The main advantages and limitations would be broadly the same as for the model above, with decentralisation meaning that there would be no strong centre. This would be likely to hinder effective dissemination.

Example:

An Australian equivalent of this model would be a series of organisations like the National Centre for Vocational Education Research, between them undertaking all funded applied research and development.

c. A national centre with several 'branches'

This role is implied in the Memorandum of Association of the NCVER, which gives as an objective "to establish and maintain, in such parts of South Australia and elsewhere as shall from time to time be determined by the Company, centres for carrying out research into and developing the needs of vocational education and training in Australia."

The advantages and limitations would be similar to those listed in the above two examples. It would also be necessary, if pursuing this option, to assess the reasons why this has not happened as part of the NCVER's activities.

d. A universities-based consortium model

A number of universities plus one or more designated independent research bodies form a consortium to jointly undertake research. (This is the current USA model. All

participating universities or research bodies have Site Directors who meet regularly. As well as their site responsibilities, which consist of supervision, coordination and facilitation of projects, they participate significantly in the choice of projects to be funded each year, and also contribute to the setting of the next Five Year Agenda.)

Advantages:

- It taps into a wide range of expertise by bringing in some full-time researchers as well as those based in universities — for example the University of California at Berkeley has at best 8 people involved in vocational education research, whereas the series of organisations that currently form the NCRVE in the USA bring the number of researchers to about 70.
- It tends to maximise introduction of new ideas into vocational education and training research.
- The likelihood of critical analysis of policies by independent researchers is preserved.
- University reward structures will encourage researchers to produce refereed journal articles and monographs as well as the consortium publications. This will create a more viable and healthy vocational education and training research literature than exists at present in Australia.

Limitations:

- Further decentralisation means even more of a lack of a strong centre of leadership.
- There is a less obvious connection with the needs of policy makers and practitioners than would be provided with the consortium/partnership model.
- Research of value to industry is less likely to be undertaken.

Example:

An Australian example might be a series of universities plus the National Centre for Vocational Education Research jointly cooperating to undertake funded applied research.

e. A national consortium of R&D partnerships

A national Research Consortium is envisaged as an effective approach to achieving the aims outlined above. The consortium would consist of a grouping of the various partnerships described in the previous section, coordinated by some appropriate body. Apart from coordinating the partnerships, the coordinator would, in the early stages, assist the establishment of partnerships. In addition, the coordinator would ensure that the Research Consortium became part of an international network of research in vocational education and training. Many of the issues in vocational education and training are common to all of the OECD countries and much effort would be saved by undertaking joint research with, for example, the US National Center for Research in Vocational Education or some of the European centres.

The responsibility for coordinating this consortium should be awarded following an open tender process. For example, the selected coordinator could be a member of one of the partnerships, or could be the NCVER. It would be vital, however, that the

coordinating organisation had the confidence of the participants and other stakeholders. The contract for coordination should be awarded for a fixed period (perhaps three or four years) with the notion that it could be desirable for the responsibility to move between States.

The Consortium would complement the work of the National Centre for Vocational Education Research, and work closely with it. The NCVER is seen as the main focus for dissemination activities, complemented by the partners employing dissemination strategies within their own spheres. Without a centre like the NCVER, dissemination would be unlikely to be effective.

Advantages:

- By being spread across several cities the national Research Consortium would ensure that the requisite critical mass for quality research was formed — both by including existing established vocational education and training researchers and attracting other experienced researchers (for example from education, industrial relations and economics fields) into the vocational education and training field.
- The introduction of new ideas would be facilitated by the input from the partnerships.
- Assuming that effective partnerships are established, the industry involvement should encourage 'hard-nosed' research of value to industry.
- The amount of research would be increased as competent higher education researchers, from both education generally and from specific discipline areas (e.g., economics) are attracted into research in this field, to supplement those already working in it. This would most likely lead to applied research being more solidly grounded in theoretical research.
- Critical analysis of policies by independent researchers would be more likely.

Limitations:

- Some of those involved in such a structure will have other commitments which their employers (universities, TAFE systems, industry bodies and so on) are likely to value more highly.
- Research choices might not be as sensitive to the overriding concerns of policy makers and practitioners, although this would depend on the strength of the role of the partnerships in setting priorities.
- There is the possibility of duplication of the dissemination functions of the NCVER, the national consortium and the partnerships within the consortium, although this would be unlikely to be a major problem.

4.5 A COORDINATED NATIONAL APPROACH FOR CLIENT-ORIENTED R&D

As stated in Chapter 3, the category of client oriented research constitutes the largest volume of research output in vocational education and training. Information collected in this project also suggests that more resources are allocated to development projects, including curriculum development, than research as a whole. In addition to the issues

listed in the previous section, key issues on the organisation and management of client oriented applied research and development in Australia include:

- minimisation or elimination of duplication of research and development effort;
- linking of this type of research and development to a base of knowledge and understanding provided by relevant general issues applied research and fundamental research;
- dissemination of research and development outcomes.

For the first point, mechanisms are already in place to reduce the amount of duplication of research and development conducted by vocational education and training agencies. In important areas of concern there is national funding and coordination of research and development. Examples of many committees which provide national coordination and funding of research and development have been given in section 2.4.

Some of the research and development commissioned by such committees could be classified as general issues applied research, but generally it would be classified as client oriented because it usually addresses the policy concerns of the group of commonwealth, state and territory vocational education and training agencies.

The support of research and development by these national committees is seen by many as a welcome advance on previous arrangements because it does help to reduce wasteful duplication of research and development that may be conducted by individual agencies. Such national projects have the potential for higher quality because of the larger funding pool and inputs from several vocational education and training agencies. Some of these national committees have been established for many years but most have been established in the last two years under the VEETAC structure.

Whatever new national committee structure is implemented in the future, we suggest adherence to the following principles:

- the national funding and coordination of client oriented applied research and development in important areas of concern;
- in addition to the representation of the vocational education and training agency clients, the inclusion of at least one person with research and development expertise on national committees responsible for commissioning and monitoring research and development;
- the awarding of research and development contracts on the basis of open competition, with impartial and systematic selection procedures for research and development projects;
- the encouragement of researchers in fundamental and general issues applied research areas to apply for client oriented research and development contracts;
- the inclusion of plans for development, where appropriate, in the outcomes of research projects;
- the implementation of appropriate dissemination activities, including placement in VOCED, for all research and development projects.

Some of the people interviewed during the project saw value in linking much of the current client oriented applied research and development with a broad base of knowledge and understanding. They saw this base being strengthened by fundamental and general issues based research. The value of this linkage is the likely improvement in the generalisability of client oriented applied research and the likely strengthening of the quality and relevance of the research and development.

At present the linkages between these categories of research and development are perceived as being poor, because:

- there is relatively little fundamental and general issues applied research being conducted in vocational education and training in Australia; and
- most of the researchers undertaking client oriented applied research are not involved with fundamental or general issues research.

This suggests two ways of strengthening links between the categories of research and development: firstly, by increasing the amount of fundamental and general issues research in areas related to the topics of concern in client oriented research and development; and secondly, by encouraging researchers to move across the categories of research and development. Implementation of one of the six principles listed above, where fundamental and general issues researchers are encouraged to apply for client oriented research and development, would help to achieve the latter.

On the last point of dissemination, it appears that there is little incentive for researchers and organisations to disseminate beyond the client organisation, or to place the project description and its outcomes in the national clearinghouse, as the research and development objectives are, by definition, specific to the needs of the organisation. However, many research and development projects of this type provide useful knowledge to other organisations and other researchers. Whilst the VOCED database captures information on many of these projects, particularly those conducted by TAFE agencies, many others of interest are not included. This problem could be addressed by implementing a policy in which all research and development funded by government agencies must be included in the VOCED database.

One idea for disseminating action research involves initiating a widely publicised award scheme for excellence in action research. The purposes of such a scheme would be to reward and encourage excellence and to raise awareness of the benefits of quality action research.

4.6 FUNDAMENTAL RESEARCH

Unlike the headings of the previous two sections, it would be inappropriate to conceive of 'a coordinated national approach' to fundamental research. Fundamental research is supported principally by ARC and to a lesser extent by universities' own internal mechanisms (including the enrolment of research students), with more regard to the perceived strength of an individual project than national needs. There are, however, two comments worth making:

- If a model for R&D is adopted that involves stakeholders in actively setting priorities and overseeing research, it is likely that new directions for

fundamental research will be suggested, which might then cause projects to be developed.

- It has been suggested that even applied research might shelter "micro-islands" of more fundamental research. Although this assumes a lack of tension between applied and fundamental research, it could provide a mechanism by which the funding of fundamental research would be more highly-regarded by policy-makers.[47]

4.7 FUNDING OF RESEARCH

a. The amount of funding

The data presented earlier on the relatively low level of funding for applied research in vocational education and training, and the need to convince funding authorities of the importance of research in this field, has implications for our approach to funding issues.

Overall, we believe that if we are to have the required amount of high quality research in this field, then the total amount spent will need to increase to approximately 0.5%% of the total expenditure from all sources on vocational education and training in Australia. A rudimentary costing (see Appendix F) suggests that this level of expenditure would enable the R&D needs outlined in Table 3.4 to be addressed over the next two years.[48]

Beyond this period, we favour a gradual increase of the amount to 1%, following a review of the benefits obtained during the first cycle of a R&D strategy. The figure of 1% is still well below the research allocation in other fields such as health and agriculture, but significantly higher than the present level of funding of 0.22%. The benefits of bringing the level of research up to this target are outlined in chapter 1. We suggest a phasing in of this figure, due to the small number of researchers in this field, the need for an appropriate 'culture' which values research to be built up, and the time needed to build up the necessary infrastructure. At present there is not the number of researchers to support a large injection of funds: neither in the universities, nor in TAFE systems, nor in the private sector, nor among private consultants. Over a three year period we believe that the numbers of researchers interested in and capable of undertaking vocational education and training research will have grown sufficiently so that all funds will be spent on high quality research on important vocational education and training issues. In the interim, there will be a need to invest a substantial proportion on infrastructure and increased funding for research each year as the number of researchers who could make good use of the funds grows.

It might be argued that there is no guarantee that such an injection of funds will result in an increase in quality; the proposals in this report are aimed at ensuring that the research carried out will be both timely and effective.

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47 Finn,C. jr. (1988)

48 Details are given in the Appendix. Broadly, the projects identified in Table 3.4 have been estimated to cost approximately $23M. If they were carried out over two years, this would add $12M per year to the present expenditure of about $11M, making a total of about $23M per year. This is about 0.5% of current total expenditure on vocational education and training.

b. Funding sources

The general point that was made by most of the interviewees was that there needed to be a variety of funding sources so that funds were not all tied to sectional or immediate interests. It was felt to be desirable to have some funds committed to particular projects but that sources needed to be found to enable researchers to undertake critical and fundamental research — though not without accountability mechanisms. On balance it was felt that more money should be made available for targeted issues of national importance determined by some broadly representative groups than for researchers to follow their own interests. However, money must be available for both.

A number of interviewees made the point that there are many sources of funding that have not been generally available for research by the university sector. Also, funding for commissioned research has not been vigorously sought by many in the university sector. These include funds from ACTRAC, VEETAC, ESFC and DEET.

The Federal Government will be the main source of funding. A very small proportion of the money that has been and is about to be allocated to vocational education and training by the Federal Government, should be allocated to research. Arguments for this small allocation (say 0.6 to 0.8% of the total recurrent expenditure) include the need to develop a sound basis on which to distribute increased funds promised by the Federal Government for vocational education and training.

It would be appropriate to allocate some of the defaults under the Training Guarantee to research and development.

Once there is some demonstration to stakeholders of the value of R&D in training, which is likely to follow the implementation of some of the suggestions in this report, there is the possibility of opening up new sources of vocational education and training research funding from some private sector groups like the Business Council of Australia, the Confederation of Australian Industry, Australian Institute of Training and Development, and the unions. Such funds are most likely to be made available for specific projects, and could well occur via the partnership arrangements proposed.

An obvious source of non-government funds is the industries which benefit from a skilled workforce. While it is unrealistic to expect these funds to be significant in the short term, as the benefits of research come to be more widely recognised in the wider community — that is, as a research culture develops — it is anticipated that some major enterprises will be prepared to spend a small but increasing part of their training budget on research and development in training. Some of this will most likely be in kind, through participation in the partnerships proposed.

In the longer term a levy of the type operating for the funding of training could be set up to fund research on a more permanent basis, although this would not be practicable until the perceived value of research and development increases. An advantage of such an arrangement would be the commitment that it would bring, as evidenced by the commitment within primary industries to their industry-based research organisations.

c. University research funding

The current method of funding university research is a dual system where grants are provided competitively for research and additional money is provided for

infrastructure. Leaving aside the question of the absolute quantum of this funding (though it seems far less than comparable countries) the issue of distribution is vitally important.

There is a very full account in the Strategic Review of Research in Education of the role of ARC in funding educational research.[49] Education is placed third in the social sciences in terms of the number of grants, but the number of grants per academic staff member is very low. The number of grants in vocational education and training is extremely low.

There is a major need for research infrastructure to be built up in those universities with staff who have expertise in vocational education and training — infrastructure such as library collections in vocational education and training, databases, groupings of staff with research expertise which are independent of success in any particular project bid, and courses that develop research skills in vocational education and training. Infrastructure funding is distributed in proportion to the competitive grants received. In the cases of the post-1987 universities, in which there is a need to build up research potential, there are special funds for infrastructure which are allocated on a competitive basis irrespective of the grants received. Vocational education and training has fared very badly, even under this scheme. There have been some recent suggestions that this special category should be disbanded and that this too should become openly competitive. If this were to happen, the sought increase in the quality and quantity of vocational education and training research would be highly unlikely to occur. Eventually, established researchers might enter the field but the potential researchers in the post-1987 universities (the only institutions with significant numbers of academics in the field) would have little opportunity to realise their potential.

There are a number of issues relating to the funding of research which are peculiar to vocational education and training. One which arose from the submissions and interviews was the fact that vocational education and training was not highly regarded in Education faculties, let alone in the universities as a whole. This is particularly felt to be the case in some post-1987 universities, where the desire for institutional credibility is thought to be compromised by an educational field which was perceived to dealt with manual occupations. This phenomenon is not peculiar to Australia: similar views have been expressed by vocational education and training researchers in the USA and Europe. While there is evidence that this view is being challenged as a result of the convergence of vocational education and training with education generally that is occurring in most developed countries, it is still alive and will persist for some time in the absence of special funding mechanisms. It would appear, however, that some direction needs to be given to the post-1987 universities regarding the importance of support for research in vocational education and training, as it appears that the field of vocational education and training has received no infrastructure funding in any university in recent years.

d. The role of the ARC

On the question of the structures and the sources which might support the research effort needed there are a number of similarities between our position and the position of the Strategic Review of Research in Education. However, the ARC's charter means

49 See McGaw, B. et al (1992), pp 33-47

that it will never be in a position to fund the research that needs to be done in vocational education and training.

Nomination of a priority area

The ARC should be requested to nominate vocational education and training as a priority area for ARC funding; this would potentially encourage academics in education and other relevant faculties which have not traditionally undertaken research in this area, to adapt their disciplines and interests to vocational education and training research. This, coupled with the earlier suggestion on a national consortium, should encourage researchers in other fields to enter the field of vocational education and training research, either as individual researchers or as part of multidisciplinary research teams.

Appropriate expertise on ARC panels

There is a need for an increased number of educational experts on the social science panels and the need for appropriate assessors to review research proposals from the field of vocational education and training. This is preferable to setting up a separate panel for education, as that would mean that decisions about the amount of money for education would be made at an earlier point than currently, and on criteria which may be outside the influence of vocational education and training stakeholders.

A more appropriate comparative index

Success on commissioned grants needs to be included by the ARC as a criterion for allocating small grants and research infrastructure funds. The fact that this does not occur at present disadvantages researchers in vocational education and training because, by the nature of the research funding process, many R&D projects are won competitively and yet not taken into account in assessing the 'success' of the institution. Also, as there is almost no ARC funding of vocational education and training research at present, this change is essential if vocational education and training researchers are to be encouraged to undertake the needed research on general issues in the field.

e. Funding the training of researchers

Full-time research training

As the section on the training of researchers points out, there is a real need to consider ways of developing researchers besides the traditional university standard of several years' full-time study leading to a Doctorate. As the Strategic Review of Research in Education indicates, the fact that the vast majority of researchers come to research via a teaching career means that the age of beginning researchers is higher than in most other fields or disciplines. This is even more true in the case of vocational education and training researchers, where most do not even enter the field of teaching or training until they are in their mid to late thirties. Any scheme to develop researchers needs to take into account the family responsibilities of the potential researchers. In effect this means the need for shorter educational research training than the traditional Doctorate and the need for far higher allowances for full-time study than are usual.

The cost of this would be small, since the numbers of those undertaking such courses full time each year would be very small. Post-graduate scholarships under existing

schemes could be topped up by funds available to the proposed nationally-oriented overseeing body, or by individual TAFE systems.

'Part-time' training of researchers

Apprenticeships in research, in which teachers and trainers work in association with experienced university researchers for varying periods of time on major projects, should be made available in all states and territories. These could be jointly funded by universities, TAFE and the Australian Institute of Training and Development or similar professional organisations.

TAFE authorities should also consider scholarships for teachers to undertake Masters degrees part-time. As well as their direct effect on the individuals who undertake them, their existence can strengthen the understanding of the benefits of research within TAFE systems, as practitioners enrolled inevitably draw resources from the system.

CHAPTER 5
DISSEMINATION: LINKING RESEARCH, POLICY AND PRACTICE

5.1 DIFFUSION OF KNOWLEDGE THROUGH A 'RESEARCH CULTURE'

Research and development in vocational education and training is essentially about creating new knowledge of vocational education and training which ultimately may lead to changes in practice. However, information collected in this project suggests that the accumulation of new knowledge, and its use in vocational education and training, have been retarded by:

- a perception of most practitioners that research is not very useful;
- relatively little research being undertaken by practitioners;
- a lack of many effective linkages between researchers, practitioners and policy-makers;
- a weak relationship between fundamental research and applied research; and
- a perception of most researchers that the translation and transfer of their efforts is not a worthy activity.

The combination of these problems is sometimes referred to as a lack of a 'research culture' in vocational education and training.

Many argue that strategies are needed to develop a research culture in vocational education and training. The need for a research culture is justified on the grounds that the accumulation of new knowledge and its use in vocational education and training is very restricted, and research and development is not stimulated, without the existence of a strong research culture.

Three models for the diffusion of knowledge have been developed by Havelock[50]; these are termed the linear, social interaction, and problem-solving models.

The linear model

Research on the process of diffusion of new knowledge indicates that to be effective, the diffusion process requires the active participation of practitioners and policy makers in the research and development enterprise. This contradicts the classical linear model of new knowledge diffusion in education, illustrated in Figure 5.1, in which practitioners and policy makers play a passive role.

Some of the difficulties of the classical linear model can be seen from the following:

> "Why then is social research so often criticised? In part, the criticism seems of social research seems to result from a belief in a 'simple' model for knowledge generation and impact which has it that social research can generate *facts* and

50 See Havelock, R.G. (1971)

that those facts can lead users to make unfettered decisions that will improve social life. This 'simple' model seems to be accepted by many persons and to underlie a good deal of social research funding — particularly funding for applied studies. However, the 'simple' model is both narrow and unrealistic, and when social research fails to deliver the crisp *facts* expected of it, and its knowledge does not have hoped for effects within education and elsewhere, believers in the 'simple' model get discouraged." [51]

Figure 5.1
The classical linear model of new knowledge diffusion[52]

One notion that must be rejected is the assumption...

"... that the sheer fact that knowledge exists presses it towards development and use. However well or poorly this model describes events in the natural sciences, in the social sciences few examples can be found. The reasons appear to be several. Social science knowledge is not apt to be so compelling or authoritative as to drive inevitably toward implementation. Social science knowledge does not readily lend itself to conversion into replicable technologies, either material or social. Perhaps most important, unless a social condition has been consensually defined as a pressing social problem, and unless the condition has become fully politicised and debated, and the parameters of potential action agreed upon, there is little likelihood that policy-making bodies will be receptive to the results of social science research." [53]

However, this comment is made about the use of the results of social science research generally, and the opinion is perhaps too pessimistic to apply completely to many areas of research in vocational education and training.

Two more effective models, in which the practitioners and policy makers play a more active role, are:

- the social interaction model;
- the problem-solving model.

The social-interaction model

The social interaction model[54] views knowledge diffusion as a process requiring informal personal contacts within a network or association of individuals, and is presented in Figure 5.2. In any field such as vocational education and training there would be several overlapping networks so that knowledge may pass both within and between networks. The networks may be researcher organisations, reference groups or associations of researchers, practitioners and policy makers, and user organisations.

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51 Biddle, B. and Anderson, D. (1991)

52 Adapted from Havelock, R. G. (1971)

53 Weiss, C. (1979)

54 Havelock, R.G. (1971)

Informal personal contacts within each network provides the opportunity for the transmission of ideas. These contacts influence whether individuals accept or reject research findings and the practices suggested by research. This model is seen as being widely applicable in agriculture and medicine. To a much lesser extent, some vocational education and training innovations derived from research are diffused this way. Clearly, for research outcomes to be effectively diffused in this way, researchers need to join networks which include practitioners and policy makers, and there needs to be much overlap among the various researcher and user networks.

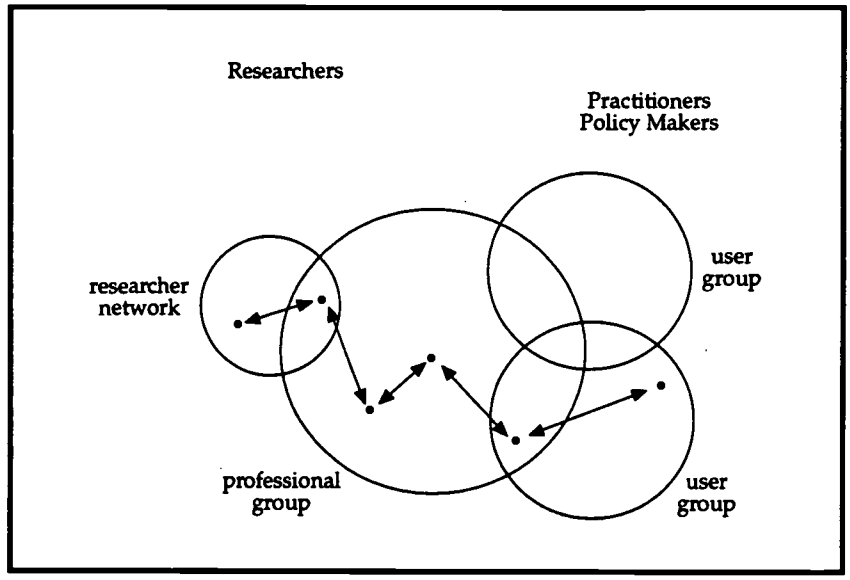

Figure 5.2
The social interaction model
(adapted from Havelock (1971))

The problem-solving model

The problem-solving model of knowledge diffusion[55] involves the user as the initiator of the process. As illustrated in Figure 5.3, each user identifies a need, diagnoses a problem, searches for a solution using the user's own resources and/or outside resources, then applies the fabricated solution to the user's practice or develops policy. Outside resources are sought when there is a gap in the information and understanding available internally. The outside resources could include consultants or researchers located in resource centres, regional offices, or universities. The outside consultant who is invited to help the user in this way is often referred to as a change agent. In vocational education and training the problem-solving model is widely applied, particularly for the category of client-specific applied research.

55 Havelock, R.G. (1971)

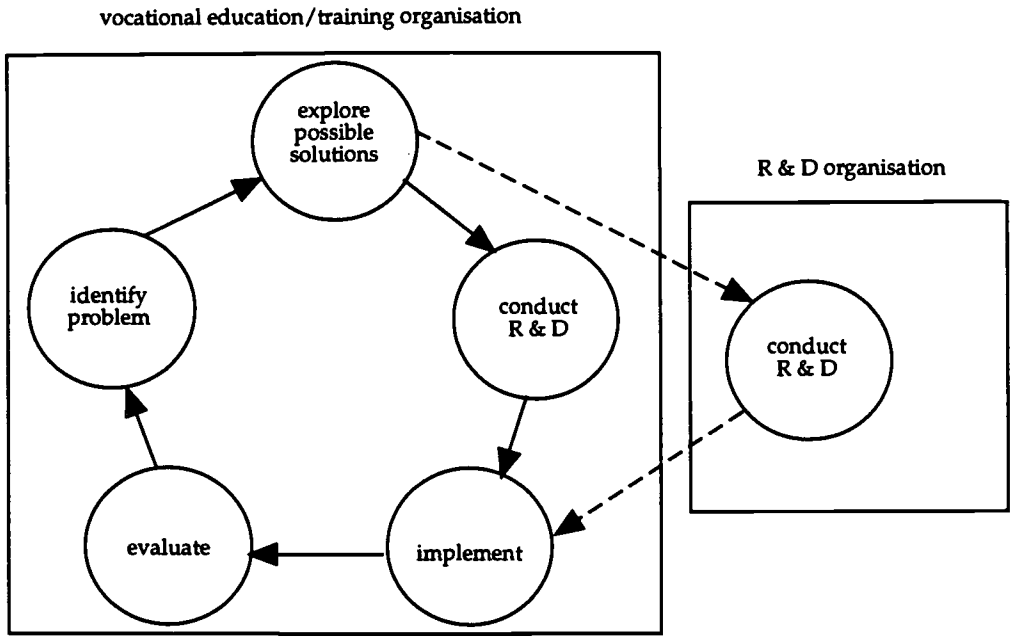

Figure 5.3
The problem-solving model
(adapted from Havelock (1971))

The three models of knowledge diffusion — the classical linear model, the social interaction model and the problem-solving model — may operate simultaneously and in parallel. Our assessment is that all three actually are operating in vocational education and training in Australia at various levels of effectiveness[56]. However, current research and development policies and practices largely appear to be based on the classical linear model. What is needed is the implementation of policies based on the problem-solving and social interaction models to maximise the impact of research on policy and practice. This strategy would lead to a strong research culture in which practitioners and policy makers are very active in the whole of the research and development enterprise.

5.2 PRINCIPLES FOR EFFECTIVE DISSEMINATION [57]

a. 'Changing people, not delivering information'

Most practitioners do not view research as very useful. This applies even more so to vocational education and training than it does to education in general, since practitioners in vocational education and training are much less likely to have had exposure to research and its potential contribution to practice in their professional preparation. The same comment applies to some policy-makers, especially those who have risen from the ranks of practitioners, although a more frequent complaint from them is the dearth of research that addresses their needs. Hence, as well as increasing

56 Keeves, J. P. (1990), p.720

57 The ideas in this section have been greatly influenced by Peter Seidman, Director of Dissemination of the National Center for Research in Vocational Education at Berkeley. The project team gratefully acknowledges his contribution.

the amount of quality research in Australia that addresses priority issues, there is a clear need for fresh ways of disseminating the fruits of vocational education and training research and development so that they become more relevant to, and are seen to be more relevant to, the needs of practitioners and policy makers. This includes the need to develop in practitioners an appreciation of the role of research in informing practice. Thus the first general principle is that the focus of dissemination initiatives and strategies is the need to change people, not to deliver information. This "people come before products" approach means, for example, that the following three dissemination strategies are of decreasing effectiveness:

- getting people together to exchange and interpret information ('people centred');
- helping people in the field 'obtain information and make choices' ('people assisting');
- distribution of material ('information centred').

The implication here is not that 'information centred' and 'people assisting' initiatives and strategies are to be avoided, but rather that by themselves they are very likely to prove relatively ineffective. Their main value lies in the support that they offer to the strategies above them in the list. However it should be noted that while the above categories provide useful ways of thinking about initiatives and strategies, they are not completely mutually exclusive; for example, whilst printed reports of research are usually 'information centred', reviews of recent research on some topic are best classified as 'people assisting'. So there will be some judgement involved in assigning categories in borderline cases.

b. 'Multiple simultaneous strategies'

Successful dissemination also requires that knowledge transfer be a continual process, rather than a lock-step or one-off process. The main reason for this is that people change in different ways and at different rates; there will always be a variety of people at different points on the continuum, at various stages of readiness to understand research and its relevance to them. This leads to the second general principle for dissemination that multiple simultaneous strategies are essential.

c. 'The roundabout routes of dissemination'

Much research, even applied research, will never be immediately relevant to practitioners, and indeed it would be unrealistic to expect it. To take a medical analogy,

> "... an ordinary practising doctor is unlikely to read most research literature ... Instead the relevant aspects of that research are utilised in the activities of a wide variety of 'mediating' institutions that use the relevant parts of the research to produce products and services of more direct relevance to the practitioner ... the pharmaceutical companies, medical equipment manufacturers, teaching hospitals, ... " [58]

Such arrangements are uncommon in vocational education and training.

Another difficulty that needs to be taken into account when discussing dissemination is that in some cases research has an impact that is not directly quantifiable. Many

58 Glenman, T.K. (1992)

people — teachers, staff development officers, curriculum experts, administrators — find out about research results, however they are communicated. They read about it, hear about it, and so on, then they interpret it in the light of their own contexts and adapt it to their needs, and apply it. By the time it is used, the particular innovation cannot be shown to have arisen from any particular piece of research, and good research will even be adapted in ways not conceived of by the researchers. Therefore for many types of research we cannot use direct indicators of its benefit to the field. This type of research outcome is what Keeves[59] calls "knowledge for understanding".

With these principles in mind, we now suggest ways of maximising the impact of research and development on policy and practice in Australia.

5.3 STRATEGIES AND INITIATIVES FOR EFFECTIVE DISSEMINATION

The recommended strategies are based on the assumption that all three approaches to knowledge diffusion need to operate effectively if research and development are to make the fullest contribution to vocational education and training reform. This will require a shift of emphasis away from linear approaches to more interactive approaches in which the relationships between research, policy and practice are more intimate and more complex. However, there is still room for some significant improvements to linear approaches to knowledge diffusion as well.

a. Strengthening action research

The interviews and submissions showed that many see action research as an important way of increasing the impact of research on practice. Some argue that practitioners who are encouraged to undertake action research will be much more active in seeking the outcomes of research undertaken by others and applying the findings to their own practice. Others have reservations about the quality of action research and have doubts about its usefulness. We believe that the quality of action research could and should be lifted, and the quantity of action research and number of practitioners using action research increased, to enhance the impact of research on practice generally.

It has been suggested that initial preparation courses for vocational educators and industry trainers should provide training in action research skills, and research should be recognised in job specifications and promotion criteria for vocational educators and trainers. The expansion of action research should help practitioners to manage change more effectively in their organisations, and to tap into the current research resources.

To provide some assurance on quality of action research and to build stronger networks, practitioners should be encouraged to interact with a research consultant or 'change agent' at critical points in the research process.[60] The local partnerships suggested earlier would be in an ideal position to provide advice to vocational educators and industry trainers at critical points in action research projects.

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59 Keeves, J. (1990), p716

60 An example of this is the Masters degree program for selected TAFE staff at UTS which was described in Chapter 4.

b. Research and development networks

A little-used approach in vocational education and training is the fostering of networks of researchers and users. Such networks could[61] :

- select, synthesise and interpret the findings of vocational education and training research and development for vocational educators, trainers and policy makers;
- identify successful innovations and spread information about such practices;
- provide information to consumers on vocational education and training products;
- communicate the needs of practitioners and policy makers to researchers;
- collect information on the experiences of practitioners and add this to the accumulated body of knowledge about vocational education and training.

Interactions within each network could include:

- one to one informal contacts;
- workshops and seminars;
- talks and other presentations;
- conferences.

A range of networks currently exist in vocational education and training, but overall these are ineffective in knowledge diffusion between researchers and users. None of the existing networks have the characteristics of strong membership by both researchers and users, and exclusivity to vocational education and training. Existing networks include:

- researcher and user associations in education (e.g. IER, AARE, ACE);
- Australian Institute for Training and Development;
- Australian Human Resources Institute;
- Australian Institute of Management;
- AUSTAFE (the association of TAFE College directors and other senior staff);
- TAFE Division of the Australian Teachers Union;
- networks associated with Industry Training Committees/Advisory Boards and other industry-specific networks;
- user groups fostered by DEET, DIR and DITAC (e.g. workplace reform user groups);
- the Adult Migrant Education Program and Adult Migrant Education Service;
- ad hoc networks in particular fields of interest in vocational education and training (e.g. Work Process network based in Melbourne);
- networks associated with adult education and/or vocational education departments in universities; and

61 Keeves, J. (1990), p721

- networks associated with the National Centre for Vocational Education Research.

One step that would greatly improve networking in vocational education and training is the establishment of a single association of vocational educators, trainers and researchers. This could be achieved by the broadening of an existing network or professional association (such as AITD), or starting a new association. With many changes recently in vocational education and training, the time may be right for the successful establishment of such an association. This possibility could be usefully discussed at the international conference being organised by the National Centre for Vocational Education Research in Melbourne in December 1992.

Other networks in vocational education and training with a narrower focus could be established to assist with the widespread adoption of particular innovations or products. Change agents could be appointed to develop such networks. It is proposed that staff with particular expertise in change be included in any new structures, and that they explore a range of networking approaches, including electronic mail networks which link practitioners to the centres.

c. The dissemination role of the National Centre for Vocational Education Research

As already suggested (Chapter 4) the National Centre for Vocational Education Research should have a central role in dissemination activities. This could include the following examples, many of which are already being undertaken by the Centre: running of annual conferences for vocational education and training researchers, the commissioning or compiling of syntheses of vocational education and training research, work on national statistics, facilitating research exchanges, and the dissemination of vocational education and training research throughout Australia and beyond. Dissemination would involve running of conferences in addition to the commissioning of and publication of material of various types: books, monographs, academic journals, practitioner journal, newssheets and the National Clearinghouse, possibly in electronic on-line format.

A good example of an initiative of the NCVER that filled a gap in Australia is the organisation of biennial national international conferences on vocational education.

However, consistent with the need for multiple simultaneous strategies, it is also necessary that any new structure — say, of a consortium of partnerships — should also incorporate dissemination into the core of its activities.

The following are the kinds of dissemination activities for which it is suggested that the National Centre for Vocational Education Research be mainly responsible. Some of these are occurring already, while others are not. All are important for a successful dissemination strategy.

d. 'People centred' activities

The following strategies for involving practitioners have been suggested through the interviews, search conference, submissions and information collected during a visit to the National Center for Research in Vocational Education in the US.

- *Pre-conference workshops for practitioners:*

  Held over two days prior to vocational education and training Conferences (or, alternatively, at a Summer School). The emphasis is very practical — what

works and what does not work. Organisers need to identify exemplary programs and initiatives and enlist the people involved to give presentations/demonstrations on them.

- *Video-conference versions of pre-conference workshops for practitioners (e.g. satellite links between various TAFE colleges):*

  This saves fares but needs a committed local teacher to organise it effectively. The format is an introduction/preliminary presentation by the committed local teacher, then 'expert' input via video, preferably interactive, then follow-up discussion and planning for action.

- *State meetings of vocational education teachers and trainers:*

  Provide speakers on the implications of research as a form of continuing education for practitioners.

- *Continuing Education/Staff Development Programs to train vocational education teachers and trainers as action researchers:*

  At present large numbers of TAFE teachers, and some trainers, undertake bachelor degrees in education with a major focus on vocational education and training. Relevant universities should be asked to review these courses to ensure that sufficient emphasis is placed on helping those enrolled to become effective users of research.

- *Electronic Mail:*

  The National Educational Association (school education, not vocational education) have had considerable success with electronic mail — they have found that, with a good facilitator, the medium is a great leveller, and vocational education teachers tend to communicate more on the same level as university staff who might be involved, feel that their knowledge and perspectives are valued, and that they are listened to.

e. 'People assisting' activities

- *A brokerage service:*

  People ring up with a query and are told who to contact, what to read, etc. This is widely used in the US.

- *Development projects:*

  Effective dissemination is greatly helped by high quality development activities that turn research results into something useable for practitioners. However development is expensive and needs to be specially funded. While the major vocational education and training providers and the National Centre for Vocational Education Research should continue to have primary responsibility for this area, it is the one on which a research organisation's reputation amongst practitioners rests, so it should not be neglected by any new structure for vocational education and training research.

- *'Best practice' publications*

  Development of materials based on 'best practice' in vocational education and training, particularly concerning on-the-job training approaches which have been particularly effective.

- *Publications for the practitioner:*

  Publications which translate research information into straightforward practical language for teachers have had some impact. The 'Getting to grips with ... ' series introduced by the Centre about two years ago has been very successful, with 3400 copies of the most popular title being printed. In the school education field in Australia and New Zealand, 'SET' is aimed at the general teacher market. There are equivalent publications in some other countries. SET has been appearing for about eight years and has a steady number of subscribers (about 3,000 in Australia and 2,000 in New Zealand). The editor reports that if more money was available for development, SET could increase its effectiveness by expanding its translator base and setting up an advisory/brokerage service. CHANGE AGENT, which is a US equivalent of SET published by the National Center for Research in Vocational Education, reportedly does not sell very well. One view is that a lower cost publication would attract more support.

- *Critical Reviews:*

  Critical reviews of research and development in particular areas should be written from time to time for the informed practitioner.

- *Magazines*

  Like the 'publications for the practitioner' above, magazines can be used to translate research information into practical ideas for teachers. They can also include descriptions of innovative practices, and information on newly-released books and forthcoming conferences. A successful example is *The Australian Training Review*, first published by the NCVER in 1991.

- *Newsletters:*

  The NCRVE in the US publishes a newsletter for vocational education teachers which seeks to inform them of the latest developments in vocational education and to summarise recent research. The focus of the newsletter is trying to make it easy for teachers to follow up leads.

f. 'Information centred' activities

The National Centre for Vocational Education Research had been very active in publishing a wide range of reports, books and learning materials. Last year 881 separate organisations or individuals bought something from the Centre. The following ideas were received in the project:

- *Research reports:*

  At present the National Centre publishes about 20 full research reports each year, with a print run of 200 to 400 for each. Over 100 of these go to subscribers, and about 50 go to people and organisations on the 'free list'. Relatively few research reports, however, are sold individually.

- *Journal:*

  University researchers regard journals as a very important way of disseminating research outcomes and accumulating knowledge in particular fields. However, journals are mainly read only by researchers, and are expensive. The National Centre publishes the 'Australian Journal of TAFE Research and Development' (two issues annually) with approximately 165 subscribers. Next year it becomes the 'Australian and New Zealand Journal of Vocational Education Research'.

- *Mailing lists of publications.*

- *Booths at national conferences selling publications and other materials.*

- *Clearinghouse and databases.*

  Ideas for the enhancement of the VOCED database that have been suggested include changing to an electronic on-line format, linking into the AARNET system, and extending its coverage along the lines suggested in 3.1.

- *Information/assistance for practitioners and others on how to use the clearinghouse, databases and indexes.*

- *The media:*

  Use of the media to popularise and publicise vocational education and training research outcomes, and to encourage discussion and debate. The NCVER has been active in this way through local and national radio, articles in *The Financial Review*, and other magazines.

g. Monitoring overseas ideas and developments

During the course of the project we became aware of two things — firstly, there are many overseas developments of which those involved in vocational education and training in Australia are just not aware, and secondly, that a number of policy initiatives in Australia have been based on quite scanty information about overseas practice. Keeping abreast of overseas developments is a taxing task, involving an understanding of the different cultures as well, in many cases, of different languages. (Some of the centres and programs — not all of them research-based — which would be relevant are the NCRVE (USA), BIBB (Germany), Scotvec (Scotland), FEU (England), Dept. of Employment (UK), CEREQ (France), AFPA (France), CEDEFOP (Europe) and material from ILO and UNESCO.) Most of this material, especially English language reports, is available in Australia through the VOCED database operated by the NCVER. It is essential that there be a mechanism to ensure that those in the field are made aware of these developments, by those in a position to prepare a critique as well as fulfilling a 'reporting' role. There is a need for reviews/critiques of recent reports in areas of topical interest to be disseminated widely in Australia. In order to spread the load, it is recommended that this latter task be spread among the various local partnerships, with partnerships being funded to carry out this activity and with dissemination of the findings being carried out according to the suggestions elsewhere in this chapter.

h. Other suggested dissemination activities

In addition to the above suggestions, the following are the kinds of dissemination initiatives and activities which will be crucial to the increased contribution of research to the nation's vocational education and training:

- *Inclusion of dissemination strategies in research briefs.*

  All grant applicants should be required to specify the intended audience for their work and the means by which that audience could be reached. (This is a critical element of the strategy, and will need to be monitored.)

- *An improved system of keywords/indexing.*

  Several interviewees pointed to an urgent need for more regular mechanisms to improve and update the keywords/indexing of Australian databases with respect to vocational education and training. CEDEFOP, for example, is funded for this in Europe. It appears that few are aware that the APSDEP thesaurus, which is used by Australia's VOCED database, is updated on a quarterly basis. However, it was felt that other Australian databases do not currently reflect the changing face of vocational education and training.

- *An international network for vocational education researchers on Internet (through AARNET in Australia)*

- *A directory of research, researchers and research areas that is easily accessed.*

  The aim should be for integration into overseas directories.

- *A professional journal to report research outcomes, publish commissioned state-of-the-art reviews, etc.*

  A journal that is widely read by academics and practitioners was proposed by many of those interviewed. NSW TAFE, for example, intends to publish a journal for vocational educators.

- *Action research:*

  More use of participative and action research methods to involve practitioners in research. The Peel Project ('Project for Enhancing Effective Learning'),[62] which involved a number of researchers, classes and teachers, is a useful model.

- *The media:*

  In the longer term, efforts to popularise and publicise vocational education and training research outcomes, and to encourage discussion and debate through the media.

A number of suggestions aimed at improving knowledge diffusion in vocational education and training have been discussed in this chapter. These should be viewed as an integrated package of measures to improve the efficiency and effectiveness of knowledge diffusion in vocational education and training. To some extent the success of each innovation depends on the successful implementation of the other proposed innovations in knowledge diffusion.

62 Baird, J.R. & Mitchell, I.J. (1986)

5.4 DISSEMINATING THE PROPOSED STRATEGY

It is suggested that the dissemination of the outcomes of this project, and the national research and development strategy adopted by VEETAC, should be carried out in a way that models some of the dissemination approaches discussed in this chapter. The following activities are proposed:

- publication of this project report and an executive summary, with a free distribution to the major stakeholders in vocational education and training and all those who participated in the project (including those interviewed and those who provided submissions);
- wide distribution of a final project newsletter (already 1200 organisations and individuals have received the first newsletter);
- presentation of the outcomes of the project and, when decided, the VEETAC strategy, at appropriate conferences, meetings of groups and other forums, by members of the project team and members of the Working Party;
- the design and conduct of workshops on aspects of the strategy for groups of practitioners and policy makers;
- involvement of groups of practitioners and policy makers in the planning and implementation of aspects of the strategy.

Most of these would be undertaken, to some extent, as a natural outcome of the momentum that has been created by the project. However, we suggest that a small amount of additional funding be provided to fully exploit the opportunities for dissemination and committing practitioners and policy makers to the changes proposed.

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