

DOCUMENT RESUME

ED 286 054

CE 048 384

AUTHOR Hall, William C., Ed.
 TITLE Research and Development Digest--2. A Summary of Published Research by the Centre for the Period 1 July, 1986 - 30 June, 1987.
 INSTITUTION TAFE National Centre for Research and Development, Payneham (Australia).
 PUB DATE 87
 NOTE 66p.
 PUB TYPE Reference Materials - Directories/Catalogs (132)

EDRS PRICE MF01/PC03 Plus Postage.
 DESCRIPTORS Accountability; *Adult Education; Adult Educators; Clearinghouses; *Continuing Education; Cooperative Planning; Curriculum Development; *Curriculum Research; Educational Needs; *Educational Research; Foreign Countries; Job Training; Postsecondary Education; Program Evaluation; *Research and Development; Research Methodology; Research Projects; Retraining; Sign Language; Small Businesses; Student Evaluation; Teacher Education; *Technical Education; Transfer of Training
 IDENTIFIERS *Australia; Evaluation Research; TAFE (Australia)

ABSTRACT

This digest summarizes the contents of the more than 50 separate items that were published by the Technical and Further Education (TAFE) National Centre for Research and Development in 1986-87. These items include major research reports, video programs, newsletters, clearinghouse reports and textbooks. The first section provides an overview of the Centre's work and its publications and discusses how to use the digest and other Centre publications. The second through sixth sections summarize the in-house, outside-funded, commissioned, and seed research projects published by the Centre during 1986-87. The seventh and eighth sections contain descriptions of regular Centre publications and all of the Centre's current research and development projects. The following are among the topics covered in the research publications described: teaching in a TAFE college, the continuing education needs of full-time TAFE lecturers, delivery of TAFE services to persons in remote areas, materials for and about small businesses, the TAFE register of educational computing software, student assessment, selection for the trades, educational accountability, cross-sectoral transfer from TAFE to higher education, transferable skills in TAFE, cooperative programs between TAFE and the schools, Australian experiences in providing training and retraining for adults who have lost jobs because of technological advancement, TAFE curricula, evaluation of TAFE programs, Australian sign language as a second language, the demand for laser technicians, computer-integrated manufacture, and some lessons from England on education and training. (MN)

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TAFE NATIONAL CENTRE FOR RESEARCH AND DEVELOPMENT LTD

048384

RESEARCH AND DEVELOPMENT DIGEST 1987

RESEARCH AND DEVELOPMENT DIGEST — 2

A summary of published research by the Centre
for the period 1 July, 1986 - 30 June, 1987.

Edited by William C. Hall

ISSN 0818-9676

TD/TNC 14.14

Published by
TAFE National Centre for
Research and Development
296 Payneham Road
Payneham SA 5070

(Incorporated in South Australia)

Word processing by Anita Harold

Typesetting by Adelaide Phototype Bureau Pty. Ltd

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Introduction

In 1986/1987 over 50 separate items were published by the Centre, including major research reports, video programs, newsletters, clearinghouse reports and textbooks.

This *Research and development digest* is an annual publication summarising all of the research and development reports published in the previous year by the TAFE National Centre for Research and Development. These summaries include the recommendations contained in the longer reports, and so they provide the busy reader with an immediate overview of the previous year's published research activities. Also, a copy of the current Digest, together with the latest annual report and the Centre's Corporate Plan will give a good picture of the Centre's role within Australian TAFE. (All three publications are available free of charge from the Centre.)

The Digest is divided into eight sections. The first section provides an overview of the Centre's work and its publications, describing how best to use our publications (including the Digest). Sections two to five consist of summaries of the year's published research. The sixth and seventh sections deal with all other publications; and the final section lists all current research and development projects.

The *Digest*, therefore, is part of the wide range of information available about the Centre's research. Because of its key information role, the publication is distributed free of charge. Although much of the Digest consists of extracts from research reports, the decision regarding which extracts to use and the editing of the extracts has been the responsibility of the editor, not of the authors of the original reports.

1. An Overview

The Centre's research

The Centre is involved in conducting research and development through:

- in-house projects
- outside-funded projects
- commissioned projects
- seed research.

Most of the Centre's core grant from the six states, the Northern Territory and the Commonwealth is spent on in-house projects. All Centre professional staff conduct research with only a small portion of the budget being spent on administration.

In-house projects are undertaken by Centre staff (or research staff seconded to, or contracted by, the Centre). Outside-funded projects are generally in-house projects which are funded by outside bodies. Commissioned projects are those projects which are commissioned by the Centre (each year, over \$100 000 are allocated to these). Most commissioned research is undertaken by state or territory TAFE authorities. Seed research is small-scale commissioned research funded by the Centre with the hope that a larger project will develop from the work. This *Digest* describes all four approaches to research.

Using Centre Publications

The Centre is now producing the following types of publications:

- research reports and the annual *Education and Labour Force Trends*;
- *Research and Development Digest* (this publication);
- *Australian Journal of TAFE Research and Development*;
- *TAFE Projects in Progress* and *Clearinghouse reports: Initiatives in Technical and Further Education*;
- the newsletters;
- commercial publications (published by Thomas Nelson),
- other publications (eg *Annual Report*, brochures, *Project Profiles*).

Our policy is to make all of our publications available as cheaply as possible. Many are free (including the newsletters, *Project Profiles* and this *Digest*). Also, all of our research reports and *Education and Labour Force Trends* are available on microfiche, free of charge from the Centre. If a report is found to be of particular interest, then a hard copy of it can be purchased from Thomas Nelson. Hard copies should also be available in many libraries. Microfiche reader/printers will also produce hard copy from the fiche, and the Centre encourages this use of its research reports. No permission is needed to copy from our microfiche.

Summaries of all of the previous year's published research are contained in this *Digest*. In addition, articles about much of our research are printed in the *Australian Journal of TAFE Research and Development*, which is available on subscription from our publishers. After reading a research summary, feel free to write for a hard copy or a microfiche of the complete report. Bibliographic information is included in this *Digest* to assist you to do that.

Shorter summaries of all of our completed research are given in *Initiatives in Technical and Further Education* and current research is listed in *TAFE Projects in Progress*. Both publications should be available in all TAFE College libraries. *Project Profiles* is available, free of charge from the Centre, for all current research.

The suggested sequence of events when following our research is as shown below:

- (a) read about current research (which is not yet published) in *Project Profiles* (available from the Centre) or in *TAFE Projects in Progress* (available in your library);
- (b) read a summary of the completed project in *Initiatives in Technical and Further Education* (available in your library), and in this *Digest*;
- (c) if you are likely to be interested in the detailed report, obtain a free microfiche from the Centre (or borrow a library hard copy);
- (d) scan the microfiche (or hard copy);
- (e) copy sections of the microfiche (or hard copy) or purchase a hard copy from our publishers.

Some of our publications are now published, as well as distributed, by Thomas Nelson. These commercial publications and the journal are subject to the usual copyright restrictions.

Information about all of our publications can be obtained from:

Thomas Nelson
P.O. Box 4725
Melbourne
Victoria 3001.
Telephone: (03) 329 5199.

Microfiche copies of research reports, and information about current research and other Centre activities, can be obtained from:

TAFE National Centre for Research and Development Ltd.
296 Payneham Road
Payneham
South Australia 5070.
Telephone: (08) 42 7905.

The publications policy is presently being reviewed. The outcome should lead to an even wider dissemination of materials, especially to TAFE teachers.

The Digest entries

Each entry in this *Digest* consists of an overview of the research publications followed by the bibliographic details. The bibliographic details will enable readers to obtain the complete report either as hard copy from the Centre's publishers or as microfiches from the Centre. There is no copyright restriction on the non-commercial use of material from the *Digest*, although an acknowledgement to the Centre is requested.

2. In-house research

Teaching in a TAFE College

W.C. Hall (Ed.)

This book is a straightforward, jargon free, guide on teaching in TAFE Colleges. It has been written for all TAFE beginning teachers, part-time teachers, teacher trainees and experienced teachers who want to refresh their knowledge and teaching skills. Other adult educators will also find the book useful. It has been written for those teachers who teach students face-to-face, although many chapters will be useful to those whose teaching is through off-campus studies.

Each chapter has been structured in the same way: an overview (giving the purpose of the chapter), the chapter's material, and a summary with references, if required. Although it is about techniques, the book avoids an extreme behaviourist approach. There are plenty of TAFE examples, and the unifying theme draws together the different components of the teaching process, showing how they are interrelated and interdependent.

The book does not give quick and simple solutions to problems. There are already plenty of short booklets providing 'tips for teachers' which do that. This book adopts a more thoughtful approach.

Production of the book has been a team effort. Over half of the chapters were written by teaching staff at the Institute of Technical and Adult Teacher Education (ITATE) of the Sydney College of Advanced Education. Contributors were: G. Bennett, L. Field, R. Pithers, A. Tennant, D. Thew, A. Watson and G. Woodburne (now with the NSW Department of TAFE).

The book covers the following areas:

- the teaching context
- the teaching process
- writing and using aims
- planning teaching
- organising content
- meeting the first class
- teaching large groups
- teaching small groups
- teaching individuals
- teaching practical skills
- instructional aids
- background resources
- assessing student achievement
- solving concerns of teachers and students
- evaluating courses
- learning and teaching.

Bibliographic details

TD/TNC 14.11

HALL, W.C. (Ed.), (1987)

Teaching in a TAFE College. Adelaide: TAFE National Centre for Research and Development.

257 p.

ISBN 0-867 7-114-8

Format: Hard copy

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001).

Price: \$19.95.

The continuing education needs of academic staff: full-time TAFE College lecturers

W.C. Hall

This report is one of three arising from a study entitled *An investigation into the initial and continuing education needs of full-time TAFE College lecturers and senior administrators*.

The aim of this component was:

- to investigate ways in which experienced TAFE lecturers can regularly update their technical knowledge and skills, with special reference to the rapid technological changes occurring in industry and commerce.

The research was conducted at four levels. At the first level a national picture was obtained by conducting a survey of relevant and recent previous studies. The results of these previous studies were used in drawing up two questionnaires which were sent to all TAFE Colleges. The first questionnaire listed apparent (staff development) problems and the second listed possible solutions. This was the second level of the research.

The third level of research probed beyond the general picture obtained from the results from the questionnaires (which themselves were based on previous studies) and looked at examples of ways in which staff development needs were presently being met, including an evaluation of submissions which were received from higher education institutions, TAFE staff development units and National ITCs.

The fourth level of the research consisted of three case studies, one of which was a metropolitan TAFE College while the other two were country colleges. Questionnaires were administered in two of the three colleges and interviews were conducted in all three.

The main findings of the study are that:

- there is an urgent need for continuing education programs which enable lecturers to update their technical/vocational knowledge and skills in their teaching areas, and there is an urgent need to provide ways in which lecturers can keep abreast with technological change. Over 90% of all colleges recognised these as severe or important problems;
- there is an urgent need to institute continuing education programs which bring lecturers into close contact with industry/commerce. The general picture is that in most colleges such close contact (for continuing education purposes) does not exist;
- attendance at in-service courses mounted by staff development units is the most common approach to continuing education. Most of these courses are 'in-house' (conducted by, and/or, in TAFE);
- a professional network linking industry/commerce with individual TAFE College staff is essential if there is to be close college liaison with industry/commerce;
- higher education caters very little for the technical/vocational continuing education needs of TAFE lecturers;
- the continuing education needs of trades lecturers are especially acute because there are usually no formal higher education courses for such lecturers within Australia;
- the administrative structure of a college and the college management are important factors in determining staff development provision, and developing an atmosphere conducive to continuous informal staff development.

Two ways to satisfy professional development needs are:

- (a) to provide small research and development grants to TAFE Colleges for those industrial/commercial areas represented in TAFE Colleges;
- (b) to release lecturers so that they can spend regular periods in industry/commerce.

The recommendations arising from the study are:

- that higher education institutions take greater account of the needs of TAFE lecturers in their B.Ed. and postgraduate courses in education;
- that TAFE authorities place special emphasis on the in-service and up-grading requirements of trade lecturers;
- that there be a greater emphasis on conducting staff development activities within industry/commerce, and on encouraging representatives from industry/commerce to conduct staff development activities for TAFE;
- that higher education institutions and TAFE authorities form working parties to make recommendations to higher education institutions on ways in which TAFE courses can be given credit in higher education courses;
- that the Commonwealth Government give serious consideration to making special funds available to state/territory TAFE authorities so that full-time lecturers can be released to spend substantial periods, at regular intervals, in industry/commerce;
- that, as a matter of urgency, heads of staff development units meet to explore ways in which TAFE full-time lecturers can regularly update their technical/vocational knowledge and skills;
- that each year the Commonwealth Tertiary Education Commission allocate a special grant for applied research and development in those industrial/commercial areas represented in TAFE Colleges;
- that TAFE authorities develop methods of self-evaluation and/or peer group evaluation for lecturers, so that they are able to undertake a regular assessment of their own continuing education needs.

Bibliographic details

TD/TNC 14.13

HALL, W.C. (1987)

The continuing education needs of academic staff: full-time TAFE lecturers. Adelaide: TAFE National Centre for Research and Development.
84 p.

Report partly funded by the National Training Council.

ISBN 0-86397-075-3

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse).

Price: \$11.95 (Hard copy); free (m-fiche).

Also available in hard copy as a summary report, free of charge from the TAFE National Centre for Research and Development (TD/TNC 14.20).

Occupational clusters of the engineering technical workforce

G. Hayton

This study provides information on:

- the overall structure of the engineering technical workforce, including the relationships between occupations in each branch of engineering and between each level;
- the job functions of each occupational cluster and other characteristics that would be of use to curriculum planners in TAFE and other education and training bodies.

The term 'engineering technical workforce' is used to describe all staff primarily performing engineering functions between the levels of tradesperson and professional engineer or surveyors.

The study involved a national questionnaire survey and is the only one of its kind in Australia that has been concerned with the full spectrum of engineering technical workforce occupations Australia-wide. This broad scope has enabled an assessment of which skills may be required across a wide range of occupations and those which are more specialised. It has also enabled information to be obtained on the relationships between the various occupational clusters.

One of the reasons that this study was undertaken was the belief that more attention needs to be paid to the education of the engineering technical workforce. The information provided by this study will be useful to TAFE authorities and other education and training bodies because:

- it provides a sound basis for developing engineering education policies;
- it provides a guideline for planning a range of courses appropriate to the needs of industry;
- it provides data on the skill requirements of the engineering technical workforce in sufficient detail to help in the development of curricula.

Each of these is vitally important if adequate numbers of properly educated engineering technical workers are to be provided. Australia's future as an industrial nation depends on this. The introduction of new technology 'off-the-shelf', without appropriately skilled manpower to adapt and use it in industry, will not ensure that future.

The main results of the study are as follows:

Occupational Clusters

The cluster analysis in this study was successful, and resulted in 99 small clusters termed primary clusters, which were identifiable and clearly able to be interpreted. The hierarchical pattern of the clusters was also meaningful and easy to interpret. Except for a few 'outliers', the primary clusters merged into a number of meaningful intermediate clusters and these further merged into four major clusters. For example, the intermediate cluster of electrical engineering merged with the intermediate cluster of electronic engineering to form the major cluster of electrical and electronic engineering. The four major clusters were given titles as follows:

- ✧ engineering systems and administration (438 respondents);
- civil engineering and surveying (318 respondents);
- drafting and design (123 respondents);
- electrical and electronic engineering (188 respondents).

The job function profile and the background characteristics (including average age, salary, highest education, and proportion of females) of each occupational cluster are also given in the full report.

Other results

Some of the other key findings of the study were that:

- The average age of the engineering technical workforce is 33 years, with an average salary of \$23 000 (April 1985).
- The majority of engineering technical workers are employed by government or semi-government organisations.
- The overall ratio of engineering technical workers to professional engineers was found to be about 1.9 to 1. The ratio of engineering technical workers to engineering tradespeople was found to be about 1 to 1.6. These ratios vary widely between the government and private sector and vary with other factors, such as size of organisation.
- Government organisations have a higher ratio of technical workers to professional engineers than do private organisations, and larger organisations have a higher ratio of technical workers to professional engineers than smaller organisations.
- The percentage of females in the engineering technical workforce was found to be quite low, (2.6%). The percentage varied greatly among the different occupational clusters.
- The 621 tasks in the inventory used in the second survey were divided into 61 duties. Of these 61 duties, the five making the highest contribution to the job of the 'average' engineering technical worker were (in descending order of contribution):
 - written communication;
 - oral communication;
 - general administration;
 - the use of calculators and computers;
 - engineering drawing.
- Many of the duties performed by the members of each primary cluster are common to other clusters. The balance of common duties and specialised duties varies among clusters, but over the 99 primary clusters and four major clusters, five of the 61 duties were found to be very broadly performed, being common across the four major clusters, and five were found to be very specialised, being performed to any significant degree by the members of just one cluster. Of the 61 duties in the inventory, 15 duties were found to be commonly performed in two or more of the four major clusters. These duties were (in descending order of commonality):
 - written communication;
 - oral communication;
 - general administration;
 - use of calculators and computers;
 - staff supervision;
 - engineering drawing and graphics;
 - design drafting;
 - data collection and analysis;
 - maintenance;
 - finance and estimating;
 - engineering survey drafting;
 - quality testing and measuring;
 - project planning and management;
 - site inspection and investigation;
 - staff development.

- Two levels may be identified in the engineering technical workforce. People within one level, termed engineering associate level, generally require more formal education and undertake a wider range of tasks than those in the second level. People in the second level, termed engineering technician level, generally require more highly specialised knowledge and skills, and much on-the-job training. Despite this finding, many of the primary clusters were found to consist of members having educational qualifications across the two levels, and performed job functions across the two levels.
- As many as 29 of the 99 primary clusters identified in the study were composed of members requiring a mixture of skills across traditional engineering branches, the most common combination being a mixture of mechanical with electrical or electronic tasks.

These last two findings have important implications for the way education and training programs are designed.

Essentially the study found that the traditional engineering branch boundaries defined many of the occupational clusters, and that the boundary between the levels within the engineering technical workforce also defined many of these clusters. This basic structure enables specialised courses to be designed to suit the needs of occupational clusters within each branch and level, and the present TAFE course provision largely follows this pattern, although technician level courses are lacking in some areas.

Superimposed on this basic structure is the phenomenon of blurring, in which a significant number of occupational clusters cut across the traditional engineering branch boundaries and across the two levels within the engineering technical workforce. Such blurring is also known to occur in occupations other than engineering occupations.

The present TAFE course provision in Australia has, to a large extent, not been flexible enough to closely match the needs of multi-level and multi-discipline occupational clusters, and Recommendations 6 and 7 (below) relate to this problem. Matching the needs of these occupational clusters does not necessarily mean the provision of 'blurred' courses. What is recommended is the provision of sharply focused courses that meet the various needs of different occupational clusters through flexibility.

The recommendations contained in the report are as follows:

Recommendation 1

That a study be undertaken of the section of the engineering technical workforce represented by the ten heterogeneous outlying clusters found in this study. The purpose of the study should be to determine the job functions and education and training needs of this section of the workforce.

Recommendation 2

That TAFE authorities and other education and training providers use the results of this study to review their current courses for the engineering technical workforce. In particular, the needs of the engineering technical workforce, represented by the occupational clusters found in this study, should be compared with each authority's overall provision of engineering courses.

Recommendation 3

In reviewing their engineering courses, TAFE authorities and other education and training providers should closely examine those occupational clusters in this study signalled as having a higher proportion of unusual educational qualifications.

Recommendation 4

That common or core curriculum modules should be developed in those areas judged, on the basis of the results of this study and other information, to be sufficiently common to two or more engineering occupational groups.

Recommendation 5

That TAFE authorities and other education and training providers recognise the existence of two engineering occupational levels between trade and professional level, and that these be termed:

- engineering technician level;
- engineering associate level.

Further, that education and training programs be provided for occupational groups within each level, appropriate to their particular needs.

Recommendation 6

In cases where separate educational programs are designed for each of the two engineering technical workforce levels, that:

- transfer between programs in both directions be facilitated with appropriate amounts of credit allowed;
- where modular course design is employed, some modules (optional or compulsory) be made common to both programs to allow for overlapping of levels.

Recommendation 7

That educational programs designed for the engineering technical workforce be designed in a modular system to allow appropriate choice of modules for:

- mono-discipline;
- multi-discipline;

occupations. Such programs should comprise appropriate combinations of:

- common or core curriculum modules;
- specialised curriculum modules designed for single-discipline clusters;
- specialised curriculum modules designed for multi-discipline clusters.

Recommendation 8

That a study be undertaken of present and near future trends in engineering technical workforce occupations, using the results of the present study as a starting point.

That, in addition to this, a future major study be undertaken of engineering technical workforce occupations around the year 1990, the study using the task inventory from the present study.

Bibliographic details

TD/TNC 13.4

HAYTON, G. (1986)

Occupational clusters of the engineering technical workforce. Adelaide. TAFE National Centre for Research and Development.

188 p. (Plus 3 Microfiche append.)

ISBN 0-86397-257-8

Format: Hard copy; M-fiche.

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse).

Price: \$19.95 (Hard copy); Free (M-fiche).

Also available in hard copy as a summary report, free of charge from the TAFE National Centre for Research and Development. (TD/TNC 14.21).

A glossary of terms used in TAFE.

K.J. Parkinson

As TAFE in Australia is essentially the responsibility of the states, at the time of establishment of the TAFE National Centre for Research and Development it seemed that the development of a glossary of terms used in TAFE would facilitate communication among everyone with an interest in TAFE. Such a publication would:

- assist TAFE across Australia to develop consistency in the use of terms;
- assist reader of TAFE publications in understanding the way that terms are being used;
- assist researchers and other in conducting machine-based searches of the literature.

A draft glossary of terms used in TAFE was, therefore, produced. This latest glossary has been through a series of drafts. Besides drawing on a range of TAFE literature it has taken into account:

- decisions by the Conference of TAFE Directors on nomenclature and awards;
- the final version of the *Australian Thesaurus of Education Descriptors*;
- suggestions from people throughout Australia.

Two categories of terms are recognised in this glossary. Namely:

- terms which apply uniquely to TAFE. (These are usually easy to identify);
- terms used in education generally which either have a particular application to TAFE or which are common in TAFE literature and warrant special comment.

These latter terms are not so easy to identify and so a degree of judgement was required as to what should be included. In general, we have been guided by a combination of our own judgement of the literature and the advice of people who have responded to the various drafts.

One of the basic parameters within which this glossary has been developed is that the terms and their definitions should be consistent, where appropriate, with the *Australian Thesaurus of Education Descriptors*.

However, the use of the *Australian Thesaurus of Education Descriptors* alone was seen as unduly prescriptive and so terms and definitions have been drawn from a wide range of TAFE literature. A second parameter was that the provision of a single description for each item was considered to be inadequate as many terms have a variety of meanings depending upon circumstances. In this glossary, other meanings and associated matters are included under the heading 'Comment'. Comments have been collected from a variety of sources.

A Hierarchy of Terms

Four references are available for use with each term, although all are not necessarily used. **SYNONYM:** These are terms which are generally synonymous with, or variant forms of, the main term.

BROADER TERMS AND NARROWER TERMS: These indicate the existence of a hierarchical relationship between a class and its subclasses. The broader term is the mandatory reciprocal of the narrower term.

RELATED TERMS: These have a close conceptual relationship to the subject term. They are terms which the reader might find useful in understanding the subject.

The use of the references is illustrated by example in the following diagram.

BROADER TERM

Attendance modes

**NARROWER TERM
(related)**

Multi-modal students Internal students External students Attendance patterns

**STILL NARROWER
TERM (related)**

Full-time students
Part-time students

Bibliographic details

TD/TNC 12.3

PARKINSON, K.J. (1986)

A glossary of terms used in TAFE. Melbourne: Nelson Wadsworth.

167 p.

ISBN 0-86397-121-0

Format: Hard copy

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001).

Price: Hard copy \$16.95.

(The information on this publication was also included in *Research and Development Digest* — 1.)

The Delivery of TAFE services to people in remote areas — a case study with generalisations

K.J. Parkinson

Australia is a vast nation in which many people live in places which are so small that the provision of TAFE facilities is uneconomic and which are so remote from existing facilities that access to them is very difficult, if not impossible. This study is concerned with ways in which TAFE services might be delivered to these people. It concentrates on the tri-state area served by the Broken Hill, Riverland and Sunraysia Colleges, but the implications of the findings are extended to the whole of Australia.

This study examines the following means of providing services to people living in remote areas:

- self-study centres;
- residential facilities at TAFE Colleges;
- branch classes at centres away from a principal college campus;
- mobile teaching units;
- distance education;
- tele-communication links;
- radio and television transmission (including the use of satellites).

As a consequence of the study, a number of recommendations are made. It must be understood that these recommendations do not suggest that the freedom of any of the colleges to provide short courses on demand should be restricted.

It is recommended that:

1. GENERAL

- 1.1 The areas served by the TAFE Colleges at Broken Hill, Mildura and the towns of the Riverland regions of South Australia should, for the purposes of delivery of TAFE, be treated as a single unit.
- 1.2 A single multi-campus tri-state TAFE institution be established under a principal who would report to an area council made up of representatives of each constituent college council and set up under the authority of the state TAFE administration and to whom the principals of the three constituent TAFE Colleges in the area would be responsible.
- 1.3 For the purposes of delivery of TAFE programs, the procedures adopted should be:
 - (a) the development by the area council of a rolling triennial plan for the area. This report should form the basis for the first plan.
 - (b) the inclusion in the plan of the following details:
 - the existing programs to be maintained and the associated costs;
 - the programs to be initiated or varied together with the proposed location and the associated costs for capital works, equipment and staffing;
 - a dissection of the funds sought from the three state TAFE authorities.
 - (c) after the endorsement of the plan in each college, through the normal procedures of that college, the plan should be forwarded to each state TAFE authority for approval.
 - (d) after the plan, with any amendments arising from consequent discussions, has been approved by the state TAFE authorities, it should be implemented by the principal of the multi-campus tri-state TAFE institution.

- (e) the overall monitoring of the implementation of the plan should be the responsibility of the principal in consultation with the area council.

2. LICENSING OF TRADESPEOPLE

- 2.1 Reciprocal licensing of tradespeople across the states be sought
- 2.2 If this cannot be achieved, a register of interstate apprentice courses approved for licensing be prepared for each state or territory together with details of the extra requirements in those cases where licensing is not automatic.
- 2.3 If Australian tertiary counselling and credit transfer information services are established, the proposed register of interstate apprentice courses be part of those services.

3. MEETING OF GAPS BY CO-OPERATION IN THE USE OF CURRENT (INCLUDING PLANNED) COLLEGE FACILITIES (INCLUDING RESIDENTIAL)

- 3.1 The farm at Sunraysia College be used to provide the gaps in the primary industry training needs of the area.
- 3.2 An elective for greenkeepers be introduced into the apprentice course for gardeners at the Sunraysia College of TAFE.
- 3.3 The offer of Berrivale Carneries for the provision of industrial facilities for training in the packaging and presentation of citrus be investigated.
- 3.4 The Winery Cellar Procedures Certificate continue to be offered jointly by the Riverland and Sunraysia Colleges of TAFE to serve the whole area.
- 3.5 The current use of industrial facilities be continued and that no new educational facilities be provided for courses using those industrial facilities.
- 3.6 Second and third year automotive apprentices in the Riverland region attend the Sunraysia College of TAFE.
- 3.7 The existing course for plant operators conducted at Sunraysia College of TAFE serve the whole area.
- 3.8 Carpentry and joinery apprentices in the Riverland region be trained at Sunraysia College of TAFE.
- 3.9 The existing training in painting, decorating and signwriting currently provided at Broken Hill College of TAFE serve the whole area.
- 3.10 Electrical apprentices in the Riverland region be trained at the Sunraysia College of TAFE.
- 3.11 The electronics facility at Sunraysia College be used for instruction in instrumentation for the whole area.
- 3.12 Second and third year fitting and machining and welding apprentices in the Riverland region attend the Sunraysia College of TAFE.
- 3.13 The existing training in boilermaking provided at the Broken Hill College of TAFE serve the whole area.
- 3.14 The resources at Sunraysia College be used for all trade and higher level programs in tourism and hospitality except the existing Home Economics Certificate and Home and Food Service courses at Broken Hill and for courses in club management which also should be provided at Broken Hill.
- 3.15 The college section for the training of enrolled nurses should be undertaken by each of Broken Hill, Riverland and Sunraysia Colleges of TAFE.

- 3.16 Courses in animal care should be conducted at the Sunraysia College of TAFE.
- 3.17 Courses in library studies be conducted at the Sunraysia College of TAFE.
- 3.18 A Certificate in Child Care Studies be provided at the Sunraysia College of TAFE to serve the whole area and the existing child-minding facilities be used for that purpose.
- 3.19 Aboriginal people be given the opportunity for separate instruction until they gain sufficient confidence to join integrated courses.
- 4. **MEETING THE GAPS BY THE PROVISION OF NEW FACILITIES**
- 4.1 The facilities for hairdressing proposed for the Riverland College should serve the whole area.
- 4.2 The equipment for plant mechanics at Broken Hill should provide training for the whole area.
- 4.3 A facility to serve the whole area for training in distributive services (retailing) should be provided at Sunraysia College of TAFE.
- 4.4 A course equivalent to the Health and Care Certificate provided by the South Australian Department of TAFE be offered at each college in the area and suitable facilities be provided where necessary.
- 4.5 Sufficient places for 100 full-time equivalent students in business and secretarial studies be provided at both Sunraysia and Riverland Colleges of TAFE.
- 5. **COORDINATION OF PROGRAMS FOR PEOPLE LIVING REMOTE FROM COLLEGE CAMPUS**
- 5.1 Each college appoint to the staff an off-campus program co-ordinator to organise the provision of TAFE services to people in remote locations or who, for some other reasons, are unable or unwilling to attend classes.
- 5.2 The TAFE National Centre for Research and Development be commissioned by the Evaluative Studies Steering Committee (ESSC) of the CTEC to undertake a study of the feasibility of setting up Australian tertiary counselling and credit information services be supported.
- 6. **MEETING THE GAPS BY STUDY CENTRES**
- 6.1 A study centre be established at Deniliquin College of TAFE.
- 6.2 The services and facilities of the study centres should be funded so that they might be developed along the lines of the Northern Territory External Studies Centre (Advanced Education).
- 6.3 The Sunraysia College become a resource base connected to the proposed Victorian education telecommunications network.
- 6.4 The other study centres at Riverland (Berri), Broken Hill (Robinson Centre) and Deniliquin become resource and communications nodes within the system.
- 6.5 Each of the study centres be equipped with an electronic classroom.
- 7. **MEETING THE GAPS BY THE USE OF RESIDENTIAL FACILITIES**
- 7.1 The possibilities of developing a series of short courses designed exclusively for residential students be investigated.
- 8. **MEETING THE GAPS WITH BRANCH CLASSES**
- 8.1 Branch committees consisting of local people be set up in each centre where branch classes might be provided.

- 8.2 A local contact person who would liaise with the providing college be appointed in each centre.
- 8.3 The function of branch committees be to advise the college off-campus program co-ordinator through the local contact person of any matter relating to TAFE in the local community.
- 8.4 Itinerant staff who are organised by the college off-campus program co-ordinators be available to meet the needs of branch classes where local expertise is not available.
9. **MEETING THE GAPS BY MOBILE CLASSROOMS**
- 9.1 Mobile facilities should be developed as sources of power and to store equipment.
- 9.2 Separate mobile classrooms be fitted out for each type of program to be offered.
- 9.3 The units be on circuit across the whole area serving as nearly as possible the needs of a particular remote locality before moving on.
- 9.4 Five additional units to those available already be provided: welding and metal fabrication, rural studies, basic farm maintenance, basic home maintenance and computing.
10. **MEETING THE GAPS BY DISTANCE EDUCATION**
- 10.1 TAFE students in the study area be able to enrol in the distance education institution of their choice regardless of state boundaries.
- 10.2 A radio curriculum office be appointed to work with the School of the Air in Broken Hill in order to provide suitable vocational programs to people in the service area of the school.
11. **MEETING THE GAPS WITH RECENT DEVELOPMENTS IN THE USE OF TELEMATICS**
- 11.1 The recommendation of the Victorian State Working Party on Telecommunications Networking for Tertiary Education for the tri-state area be supported. The recommendation concerned is that a telecommunications network which incorporates both satellite and terrestrial distribution methods and which will enable the use of educational resources of a range of city-based institutions be established to meet the needs of the tri-state area.
- 11.2 If phasing is necessary, the phasing be technical rather than geographic.
12. **HIGHER EDUCATION**
- 12.1 The higher education study centre conducted by MADEC in Mildura be moved to form part of the Sunraysia College of TAFE.
- 12.2 The study centres be administered as part of the multi-campus tri-state TAFE institution along specified guidelines with the details being worked out in consultation with the TAFE central administration, the appropriate higher education co-ordinating authority and CTEC.
- 12.3 The possibilities of extending the provision of higher education courses by contract through TAFE Colleges in the area be investigated.
- 12.4 The possibility of providing modules of the Bachelor of Applied Science in Food Technology from the Hawkesbury Agriculture College by contract through a TAFE College be investigated.
- 12.5 The contracting arrangements being discussed with higher education institutions by Sunraysia College of TAFE be extended to include training in primary and secondary teaching.

- 12.6 Courses for registered nurses be contracted through the Broken Hill and Sunraysia Colleges and training hospitals under the supervision of Mitchell and Ballarat CAEs respectively.
13. PUBLICITY
- 13.1 Each college in the area have the facility to promote TAFE in its own region and that this be the responsibility of the off-campus program co-ordinators.
14. THE WIDER CONTEXT
- 14.1 Each state and territory establish a task force which should be provided with resources to investigate and fund pilot developments of new delivery modes based on a decentralised, off-campus approach using new communication such as electronic classrooms and AUSSAT as well as stand-alone audio, video and electronic learning resources.
- 14.2 Developments in the new delivery modes for distance and off-campus education be monitored and the information disseminated nationally by the TAFE National Centre for Research and Development.
- 14.3 The CTEC provide a new category of recurrent grant to assist with the costs of study facilities in TAFE Colleges for external higher education students. The funds be applied to establish basic bookstocks and as a contribution to overheads, including staff costs.
- 14.4 The CTEC, through the TAFE Council and in consultation with state TAFE authorities, conduct discussions with the Universities Council and the colleges of Advanced Education Council with a view to developing national guidelines for the acceptance for admission (and status) in higher education courses of suitable and relevant TAFE courses.
- 14.5 TAFE co-operate with industry and commerce in making arrangements for the training of TAFE students in remote areas.
- 14.6 TAFE Colleges form the basis for 'institutes of tertiary education' where the demand for higher education warrants it.
- 14.7 The Tri-State TAFE Consultative Committee approach the three state TAFE authorities with a request that the CTEC investigate the possibility of funding an institute of tertiary education in the tri-state area as a pilot for rural areas in Australia.
- 14.8 Where a TAFE courses is similar enough for an identical distance education course to be offered across the nation, that course be developed through only one TAFE distance education institution.
- 14.9 TAFE students be free to enrol in the TAFE distance education institution of their choice.
- 14.10 New developments in the use of telematics in distance education be cohesive and complementary between the states.
- 14.11 Distance education courses use a variety of media. The criteria for the selection of media should include their relevance to the student client group and the language and literacy formats which meet the cultural, social and economic backgrounds of the group.
- 14.12 The emphasis for the further development of audio-based distance education material be on non-broadcast media.
- 14.13 Investigation be made of the potential for expanded use of the telephone for students in remote areas for:

- (a) individual tutoring (ie one-to-one exchange between student and tutor);
 - (b) teleconferencing via loudspeaker telephone in regional or neighbourhood centres;
 - (c) teleconferencing via conference hookup for group tutoring of learners who are geographically dispersed.
- 14.14 A staff development program be conducted to prepare staff to use the telephone effectively in distance education.
- 14.15 Use be made in distance education of interactive television broadcasting using teleconferencing for the audio interaction.

Bibliographic details

TD/TNC 14.3

PARKINSON K.J. (1987)

The delivery of TAFE services to people in remote areas — case study with generalisations.

Adelaide: TAFE National Centre for Research and Development.

177 p.

ISBN 0-86397-034-6

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse).

\$19.50 (Hard copy); Free (M-fiche).

Small business material bibliography **G. Rhodes and M. Jones (Eds.)**

At the conference on small business management education and training which was conducted by the National Training Council on 22-24 April 1985, it was suggested that a national data base of small business information be established. The data were to include information about training materials and small business information courses (such as a brief description of courses, where courses are conducted, and contact names and addresses).

The complete data base as originally envisaged has yet to be started (although the TAFE National Centre for Research and Development has proposed a feasibility study). Nevertheless, it was felt by Dr. Silver (Chairman of the NCC Small Business Committee) and Dr. Hall (the Centre's Executive Director) that a start should be made to such an important project, even though additional funding was not available, and so this bibliography has been published under their direction as a special Clearinghouse Report.

Most of the work for the bibliography has been done by NCC Small Business Committee members. Their tasks were co-ordinated by the late Graham Rhodes of the Education Unit at the Royal Melbourne Institute of Technology. Final editing was completed by Marjolijn Jones, the Centre's librarian and National Clearinghouse Officer.

It is hoped that the publication will lead to the next stage of forming a national data base.

Bibliographic details

TD/TNC 13.1

RHODES, G. and JONES, M. (1986)

Small business material bibliography. Adelaide: TAFE National Centre for Research and Development.

235 p.

ISBN 0-86397-241-1

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse).

Price: \$26.95 (Hard copy); Free (M-fiche).

TAFE register of educational computing software

F. Strachan and G. Hayton

The register lists computer software and related materials which have direct use for TAFE teachers. (It does not include software for TAFE administration.) Input to the register has been wide through contact persons in each state and territory.

The entries are arranged in eight categories in the following order:

- AS — Applications Software
- TT — Teaching Tools
- AC — Art and Craft
- BE — Business and Economics
- LA — Language
- MS — Mathematics
- SS — Social Sciences
- ST — Science and Technology.

Those packages prepared for general use in commerce and industry are classified under Applications Software. Those produced specifically for classroom use are classified under the relevant subject heading or under Teaching Tools. In this issue all entries in the Language category refer to English Language. Packages which can be used across several subject areas have been entered in the category in which they appear to be most used.

Each package has been assigned descriptors which related to subject content and objectives. The index is compiled from these descriptors and forms a second means of locating a software entry.

Each software entry is identified by the category, the Register Volume number and the order of entry in the category; eg AS 1.10 refers to the tenth software package entered in the Applications Software category in Register Number 1.

Bibliographic details

TD/TNC 13.5

STRACHAN, F. and HAYTON, G. (1986)

TAFE register of educational computing software. Adelaide: TAFE National Centre for Research and Development.

165 p.

ISBN 0-86397-265-9

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse).

Price: \$17.50 (Hard copy); Free (M-fiche).

Student assessment: a handbook for TAFE teachers

P. Thomson

The handbook consists of seven chapters:

- introduction to assessment
- objectives
- types of questions
- test specifications
- item analysis
- validity and reliability
- reporting results.

Introduction to assessment

This chapter presents a general understanding of what is meant by assessment.

Assessments are very much a part of our daily lives. We are constantly asking ourselves questions involving assessment like 'Will I get to work on time?' 'Is that something I can afford?' 'Is my tennis game improving?'

The chapter considers the problem of definition. It provides an educational basis for the term 'assessment' and explains how it differs from 'evaluation'.

Objectives

This chapter explains the importance of objectives in student assessment. An introduction is given to various types of educational objectives. Examples are given of the relationship between the educational objective and the test item which is written to assess that objective.

Types of questions

This chapter has two purposes — to describe briefly some of the types of questions commonly used in classroom tests and to make the reader aware of the particular features of each type. Each question type is presented in a way that enables the reader to know under what circumstances it should be used and to know what factors to consider when the question is being prepared.

Test specifications

This chapter is concerned with the development of test specifications by the classroom teacher. Although the chapter is not directed specifically at those involved in TAFE authority-wide testing, the principles of test specification development are very similar in both cases.

The chapter looks at two aspects of classroom testing, namely:

- overall planning for the assessment of the student learning;
- planning for individual tests.

Item analysis

This chapter outlines the methods for analysing the results of classroom tests. Such analysis enables a check to be made that the questions are, in fact, testing what the teachers set out to test.

Validity and reliability

This chapter explains the importance of the properties of test validity and reliability as they apply to classroom tests.

Reporting results

The reporting of results in TAFE is presented as an area which deserves much more attention than it presently receives. Contrasts are drawn between what are the legitimate

needs of the clients of the TAFE system and what they at present receive by way of reports. Suggestions are made as to how the present system of reporting can be improved.

Bibliographic details

TD/TNC 13.6

THOMSON, P. (1986)

Student assessment: a handbook for TAFE teachers. Melbourne: Nelson Wadsworth. 163 p.

ISBN 0-17-006896-X

Format: Hard copy

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001).

Price: \$14.95 (Hard copy)

(This publication was also described in *Research and Development Digest — 1*)

Selection for the trades **P. Thomson & P. Mageean**

In 1985 the TAFE National Centre for Research and Development began the development of a number of measures that were reported in the literature as being useful in the selection of students into trade courses. The work was carried out as a pilot study in the belief that, should the outcome prove promising, it would provide the basis for a new program in 1987.

The pilot study focused on selection into two pre-vocational trade courses in South Australia. These were the predominantly female trade of hairdressing and the predominantly male trade of automotive mechanics. This report evaluates the effectiveness of the measures that were developed.

The Centre's profile of measures consisted of:

- a test of basic mathematics;
- a test of reading comprehension;
- a trainability test (a practical test specific to the relevant trade and designed to measure aptitude for training);
- a school statement on achievement and attitudes;
- biographical data and a personal statement (from the applicant);
- an interview.

Each element in the profile was designed around the requirements of the course and the trade.

There were four recommendations made in the report:

1. That a longitudinal study of the profile approach be negotiated with one or more TAFE authority with a view to validating the existing measures (suitably refined) in a wider range of trades and over a period that enables consideration to be made of performance both on the course and on the job.
2. That any use of profiles as recommended in 1 above is accompanied by a thorough cost-benefit comparative study of the existing system and profile selection.
3. That trainability tests be developed for use in selection into a range of TAFE courses and validated in terms of their ability to predict on-the-job performance.
4. That any measures developed for off-the-job and on-the-job performance be based on objectives derived from a thorough occupational analysis of the job in question and take account of the occasion and circumstances in which the performance is expected to be demonstrated.

Bibliographic details

TD/TNC 14.12

THOMSON, P. and MAGEEAN, P. (1987)

Selection for the trades. Adelaide: TAFE National Centre for Research and Development. 82 p.

ISBN 0-86397-74-5

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse).

Price: \$11.95 (Hard copy); Free (m-fiche)

Educational accountability and the need for comprehensive evaluation in TAFE

J. White (Senior Research Fellow: 1985-86)

This paper seeks to provide a rationale for the extension and reinforcement of an educational management process based on corporate planning. Such a development is required in order to accommodate increasing demands for accountability, and the need to be flexible and innovative in operation in providing for government initiatives and the changing needs of society. The first part of this paper reviews the sources of these demands for increased accountability in TAFE while the second part describe one state TAFE department's response to these challenges.

To provide for these requirements, as well as to improve the level of decision making in TAFE, a corporation planning model including internal or self-evaluation is advocated.

Present procedures for institutional evaluation are reviewed to establish their appropriateness to TAFE requirements. The models for institutional evaluation as applied to higher education in the USA and other Western countries, in which each institution is evaluated as a separate entity, are seen to be of limited value to present requirements in TAFE. Such evaluations are costly, provide information infrequently and adversely affect staff morale.

The activity-based 'self-evaluation' model operating in Sweden is seen as more appropriate to TAFE needs. This model is compatible with the corporate planning process introduced in NSW TAFE in 1983.

TAFE systems in other Australian states and territories differ in some respect from the NSW system, but there are also similarities of goals, administrative procedures and educational provision. These similarities, together with commonalities in government intent, provide justification for a similar restructuring of their educational management systems. Recent experience within NSW TAFE with regard to corporate planning is used to support this contention.

This paper proposes that evaluation of TAFE's educational activities is essential both to meet the demands for increased accountability from all stakeholders in TAFE, and to provide a proper basis for planning.

While this project is in the format of an investigative report, the nature and extent of recent developments in NSW TAFE, particularly those experiences relating to the —

- (a) restructuring of senior management;
- (b) introduction of corporate planning;
- (c) decentralisation and regionalisation of the department administration;
- (d) establishment of an Audit and Review Directorate;
- (e) introduction of program evaluation;

provide an appropriate basis for a number of recommendations on courses of action which may be of interest to other TAFE departments.

Based on the NSW TAFE experience it is recommended that in establishing procedures to meet accountability and planning requirements, consideration be given to:

1. the introduction of a corporate planning management process. This process should included the development of a corporate plan detailing corporate and strategic goals, and the development of strategic and action plans, and program evaluation;
2. establishment of an appropriate data base using generally agreed upon performance indicators;

3. utilisation of established assessment procedures, where available, to avoid unnecessary duplication of effort in the evaluation phase;
4. establishment of a separate Audit section which draws together existing financial auditing functions and extends these to cover requirements relating to effectiveness, efficiency and appropriateness of TAFE operations;
5. use of institutional evaluation as a final stage in the evaluation procedure. Institutional evaluation should be used only where ongoing evaluation indicates the need for a more thorough review of college activities;
6. development of college profiles or areas of activities. This may be required as a forerunner to the preparation of a strategic plan or as part of the evaluation of a college. The profile should identify the aims of the institution, the nature and extent of the TAFE clientele it serves, and the range of resources available to achieve the stated goals;
7. encouragement of staff involvement in the development of profiles, strategic and action planning and program evaluation. It is important for all staff to question the effectiveness and efficiency of their operations;
8. involvement of all managerial staff in staff development activities relating to corporate planning and program evaluation;
9. inclusion of a computer systems review unit as part of a comprehensive audit section;
10. publishing of outcomes of evaluation to provide an appropriate measure of accountability. This may be through the provision of annual reports or other publications in which the selected data is analysed and future directions identified.

Bibliographic details

TD/TNC 14.6

WHITE, J. (1987)

Educational accountability and the need for comprehensive evaluation in TAFE. Adelaide: TAFE National Centre for Research and Development.

75 p.

ISBN 0-86397-107-5

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse).

Price: \$13.95 (Hard copy); Free (M-fiche)

3. Outside-funded projects

During 1986-1987 the Centre undertook outside-funded projects to the total value of \$443 000. Many of these are continuing and will not be published until next year. Only projects completed and published during 1986-87 are listed here.

Looking forward: rights of passage

J. Foyster

Funded by the Commonwealth Department of Education.

In November 1982 the Conference of TAFE Directors proposed a research project with the following terms of reference.

For the range of full-time courses in TAFE offered to young people, aged 15-19 years, the project will:

- (a) examine on the basis of evaluations and other work already done by TAFE authorities and under the school-to-work transition program, the evidence as to the ways in which existing courses enhance young people's career and future education opportunities and serve their wider interests;
- (b) identify the extent to which the range of provision reflects types of student need and the extent to which duplications or deficiencies occur;
- (c) develop the appropriate bases, components and balance of curricula for the target group or groups and the associated teaching, learning and assessment methods which would:
 - (i) form the basis of a course structure for the development at the local level of initiatives relevant to local vocational needs and circumstances and the personal needs of the individual;
 - (ii) assist over time in promoting a better understanding in the community of the range of courses in TAFE relevant to the 15-19 year group.

The research work did not begin until early in 1984 and the first report: *Looking back: A review of the TAFE transition education program* by B. Beasley and C. Beasley was produced early in 1985. This concentrated upon the first of the terms of reference, but also dealt with aspects of section (b) and (c) in some of its discussions and recommendation. This, the second document, was commissioned in December 1985 and focuses on curriculum issues, in particular c(i).

This report should be read in conjunction with the Beasley and Beasley report.

The complete list of recommendations arising from this report is listed in *Research and Development Digest* — 1.

Bibliographic details

TD/TNC 13.8

FOYSTER, J. (1986)

Looking forward: rights of passage. Adelaide: TAFE National Centre for Research and Development.

80 p.

ISBN 0-86397-337-X

Format: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse).

Price: \$10.95 (Hard copy); Free (M-fiche)

Cross sectoral transfer from TAFE to higher education **K.J. Parkinson, R.S. Mitchell and C. McBeath**

Funded by the Commonwealth Tertiary Education Committee.

In this project higher education institutions in Australia were surveyed to determine their policies and practices with regard to students with TAFE qualifications who might be applicants for transfer from TAFE to higher education. TAFE institutions were asked what policies they had to encourage TAFE students to transfer to the higher education sector, what arrangements they had made to enable transfer and what difficulties there were for students wishing to transfer.

It was found that many higher education institutions were more prepared to grant admission to selected courses to qualified TAFE students if the qualification were in a course analogous to that which they wished to study at higher education level. The granting of credit was possible, but not so common.

Two principal difficulties were reported. The first was that there was a lack of consistent and public policy on transfer in higher education institutions and consequently it was difficult for TAFE qualified students to make confident judgements about the standing of their qualifications. The second was that there is little real information on the success of TAFE qualified students who have transferred to higher education.

A number of recommendations are made. They have two principal thrusts:

- the development of consistent policies on admission and credit transfer of TAFE qualified students to higher education and the publishing of these policies;
- the monitoring of the progress of TAFE qualified students who are admitted (with or without status) to higher education courses.

Informing and encouraging qualified students to transfer from TAFE to higher education

1. The CTEC through TAFEC invite the ACTD to consider the development of national policies to inform and encourage qualified students to transfer from TAFE to higher education.
2. The CTEC, through the Universities and Advanced Education Councils, seek the co-operation of higher education institutions in making current policies for the admission of TAFE qualified students specific and in publishing these policies in their handbooks and calendars.
3. Each state TAFE authority include in its handbook the information on opportunities for transfer from TAFE to higher education as they apply in the higher education institutions in its own state.
4. The TAFE National Centre for Research and Development be commissioned by the ESSC of the CTEC to undertake a study of the feasibility of setting up Australian tertiary counselling and credit transfer information services. These services would include the following on-line information to prospective students and tertiary institutions:
 - details about all tertiary courses (institution, entry, course outline, qualifications obtained etc.);
 - information about credit transfer arrangements into all higher education courses, with particular reference to the opportunities for transfer from TAFE.
5. The CTEC through TAFEC ask the state TAFE authorities to encourage counsellors and others in TAFE Colleges who are responsible for informing and encouraging students to transfer from TAFE to higher education to arrange for these potential

students to discuss their prospects for enrolment and status with staff of higher education institutions.

Policies on transfer from TAFE to higher education

6. The CTEC, through the TAFE Council and in consultation with state TAFE authorities, conduct discussions with the Universities Council and the colleges of Advanced Education Council with a view to developing national guidelines for the acceptance for admission and status of suitable relevant TAFE courses.
7. The CTEC encourage each state higher education authority in consultation with universities, CAEs and state TAFE authorities to develop detailed guidelines for the use of individual higher education institutions in formulating arrangements for admission and status for suitable and relevant TAFE courses within each higher education institution.
8. Such guidelines be based primarily on institution-to-institution negotiation and pay particular attention to continuity between TAFE and higher education programs.
9. The CTEC recommend to the ACTD that it invite its members to include in their curriculum processes, methods to improve communication between institutions including, where appropriate, participation of higher education in TAFE course planning and development.
10. State TAFE authorities negotiate with higher education institutions for the development of guidelines for and for the provision of, suitable bridging courses in selected disciplines at selected TAFE Colleges.
11. The CTEC fund approved bridging courses.
12. The CTEC through TAFEC consult with state TAFE authorities with a view to encouraging TAFE Colleges to set up voluntary consultative committees with higher education institutions in order to resolve local problems associated with the admission and status of TAFE students.

Selection policies of higher education institutions

13. The ESSC of the CTEC negotiated with:
 - The Macquarie University
 - Queensland Institute of Technology
 - The South Australian College of Advanced Education

to monitor the number of total applicants with TAFE qualifications who are admitted to the respective institutions in comparison with other students and the success of these students in relation to students with other qualifications with similar tertiary entrance scores.

14. The CTEC consider, together with its constituent councils, the provision of a grant to its ESSC to investigate the development of admission procedures which take into account:
 - prerequisite knowledge;
 - aptitude tests;
 - profiles;
 - social group characteristics;
 - work experience;

for those who hold basic qualifications for admission to higher education courses.

15. The CTEC take up with the Universities and Advanced Education Councils the fixing of quotas for TAFE qualified students in higher education courses for those disciplines with corresponding TAFE courses. Such quotas should be along the lines of, but independent from, mature-age quotas.

16. The CTEC approach state TAFE authorities through TAFEC with a view to having the level and content of all TAFE programs clearly documented.
17. The CTEC through the TAFE Council encourage each TAFE authority to make TAFE staff aware of the opportunities for cross-sectoral transfer available to TAFE students and to encourage TAFE staff to pass this information on to students.

Interest of TAFE students in higher education courses

18. The CTEC through its ESSC encourage the higher education admission bodies in Australia to keep and publish records of the educational backgrounds of applicants for higher education enrolments who were:
 - offered enrolment, by the course and institution to which they were offered the enrolment;
 - not offered enrolment, by the course and institution to which they sought enrolment.

Success rate of TAFE students who transfer to higher education

19. In addition to recommendation 13, the CTEC through the Universities Council and the Advanced Education Council invite proposals for funding from institutions which have a reasonable number of students admitted on the basis of TAFE qualifications for the monitoring of the progress and success of these students over a finite period, say four years. If possible at least one of the institutions funded should be representative of each of the groups of institutions.

Entry difficulties for TAFE students seeking to transfer to higher education

20. The CTEC through the Universities Council and the Advanced Education Council encourage higher education institutions to provide, where possible, courses on a part-time basis with lectures and tutorials outside normal working hours.

Lack of status and the need to repeat studies

21. The CTEC fund a project to make an in-depth examination of curriculum development, learning methodology and assessment procedures of selected TAFE and higher education courses in commerce and engineering.

Lack of preparation in TAFE for the study methods of higher education institutions

22. The CTEC, through its councils:
 - encourage TAFE Colleges to modify their study methods in the final phases of courses from which students are likely to transfer into a higher education course;
 - encourage higher education institutions to modify their study methods so that qualified students are able to adapt more readily to the changes.
23. The CTEC through TAFEC ask the state TAFE authorities to encourage counsellors to arrange for TAFE students who are considering transfer from TAFE to higher education to attend suitable lectures and tutorials within the institution at which they might seek enrolment.

Financial difficulties for TAFE students seeking to transfer to higher education

24. Any discussions initiated by the CTEC with a view to developing national guidelines for the acceptance of suitable and relevant TAFE courses for admission and status in higher education courses be directed to ensure that the status granted is sufficient to qualify students for benefit under TEAS.

Isolation of many TAFE students from higher education institutions

25. The CTEC encourages the extension of study centres in TAFE Colleges in isolated areas to facilitate cross-sectoral transfer in higher education.

Measures to facilitate transfer

25. The CTEC recommend to the Commonwealth Government that it allocate, say, \$750 000 per year over the three years 1987-89 to fund the following programs:

- the admission of additional students to higher education institutions which have not as a matter of policy admitted students on the basis of a TAFE qualification, to courses relevant to their TAFE qualification and the monitoring of their progress compared with the progress of students who have matriculated in the normal way;
- the granting of status to students by higher education institutions which have, as a matter of policy admitted students on the basis of a TAFE qualification but which have not generally granted status and the monitoring of their progress compared with the progress of other students at the same level;
- the development of imaginative experiments in designing courses to bridge any gap between the terminal point of the TAFE course and the entrance point of a related higher education course.

Tenders for participation in the program should be invited from suitable institutions of higher education.

Students involved in the program should be additional to the quotas normally admitted by the institutions of higher education which participate.

The tender should specify at least:

- the number of students which it is intended should participate in the program by faculty;
- the monitoring and reporting procedures intended;
- in the case of experiments in bridging courses, an outline and rationale for the curriculum to be followed.

Bibliographic details

TD/TNC 14.1

PARKINSON, K.J., MITCHELL, R.S. and MCBEATH, C. (1986)

Cross-sectoral transfer from TAFE to higher education. Adelaide: TAFE National Centre for Research and Development.

269 p.

ISBN 0-86397-002-8

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse).

Price: \$30.95 (Hard copy); Free (M-fiche)

Transferable skills in technical and further education

P. Thomson and J. Murphy

Funded by the TAFE Board, Victoria.

This is a report about the skills needed for employment in the vocational area. Although the term 'transferable skills' appears throughout the report, it is important to appreciate that there is no such thing as a non-transferable skill. A skill is a learned behaviour, therefore all skills must at least have the potential to be transferable. By linking the learning of skills to employment issues the notion of transferability assumes a special importance and this is the way it has been dealt with throughout the report.

Transferable skills are those knowledge, attitudinal and manual skills that an employee brings to a job (or an employer expects an employee to bring) which provide that employee with occupational competence and mobility.

Examples of the three types of skill are:

- the ability to multiply two, 3 digit numbers = knowledge skill;
- acceptance of the need to arrive at work on time = attitudinal skill;
- using a Phillip's head screwdriver = manual skill.

Transferable skills can be categorised into two groups:

- broad-based skills (often called 'life skills') such as basic literacy, numeracy and an understanding of the world of work. These are transferable across many jobs;
- occupationally-specific skills which are of relevance to a cluster of similar jobs, such as oxy-acetylene welding in the metal and construction trades.

Labour market trends have a considerable influence on TAFE training. Rising unemployment and technological change are closely related to the need for training in transferable skills.

Times of rising unemployment bring with them a range of related problems that affect skills training. The available jobs tend to go to the more highly educated and articulate job seekers. Transferable skills insofar as they contribute to a person being better educated and more articulate will clearly be useful to a job seeker, but, there is the overriding difficulty of convincing some employers to look for workers with the specific skills that are relevant to their needs.

The training for skills such as 'adaptability' and 'problem solving' that provide the workforce with greater mobility will be one way around some of the problems created by technological change. Greater mobility has links with greater productivity with the resulting benefits being experienced by both employers and employees. The possession of certain skills will also make it easier for workers to leap the growing skills gap between skilled tradesperson and specialist technician.

Other labour market trends such as changes to the way work is organised have less relevance to transferable skills training. However, should there be a move by more employers towards a labour market strategy that encourages progression within an organisation (rather than seeking to import skills from outside) the possession of skills which enhance internal mobility will be more highly prized than at present. Another option available for developing occupational opportunity is that of increasing self-employment; here again transferable skills will be of considerable value.

Attitudinal skills are of fundamental importance in obtaining and continuing in employment. However, only certain attitudes are amenable to inclusion in the training process. Attitudinal skills training which would involve TAFE teachers attempting to change the personalities or values of their students should be avoided. If such training is to

be attempted at all, it needs to come from outside TAFE.

The rules and regulations of the workplace, and the shifts brought on by factors such as technological change, all influence how TAFE courses are developed and taught. There are real constraints on the responses that TAFE trainers can make to meet changing skill requirements since many of the workplace developments are beyond their control.

To handle properly the various labour market issues that arise, it will be essential to ensure that any implementation of transferable skills training has involvement and support from the four sectors (employers, unions, the industrial training authority and TAFE) at all stages from design to delivery. It is also reasonable to expect governments to take the lead in ensuring such co-operation occurs. Indeed, with the potential that exists for changes to industrial legislation, government involvement will be mandatory.

Pressures for changes in training methods are mounting particularly within the traditional apprenticeship system because of disenchantment with:

- the reliance on a time-serving method to judge 'satisfactory completion' of a training program;
- the inability of some employers to give apprentices the full range of experiences they need in order to be deemed proficient in the trade;
- the inflexibility of apprenticeship legislative requirements in such things as age restrictions, educational prerequisites, and terms and conditions.

Support is growing for a competency-based system of education and training involving the specification and demonstration of job-related skills. Competencies (which would include transferable skills) are carefully identified and subjected to verification by experts. The criteria for assessing each competency are also explicitly stated and made public. Students can then progress through the training program at their own pace with assessment taking place along the way.

Going hand in hand with competency-based training is the use of modules in instruction. While there is strong evidence of their effectiveness, their introduction needs to be well planned. Most important among the issues that need to be taken into account is the requirement that teachers need to be trained in the use of modular instruction. Teachers need to know how to deal with a situation in which different students are working on different modules. This is particularly true in workshops where a wide range of practical work may be going on at the same time.

Competency-based programs using individualised instruction in the form of modules have ramifications for training policies which intrude back into labour market issues. If a trainee is able to become fully qualified well within the normally allowed time, questions of terms and conditions of employment arise. It will be necessary to review the practices whereby employers encourage an artificially-long training period (as with some apprenticeships) to ensure they receive a return on their investment in training.

Any proposals to change the way TAFE teachers teach or what they teach will require thorough planning and extensive ongoing staff development work. This applies particularly to transferable skills training where there is already evidence of a lack of enthusiasm on the part of some teachers. Educators and employers are largely in agreement that roughly the same set of transferable skills are needed by people whether they are required for completing a course of study or for working life in general.

A strategy for instilling transferable skills into vocational curricula is proposed. It requires:

- a competency-based approach;
- the use of individual progression;
- the use of modular instructional materials;

- sequencing in a way which starts with skills from the specialised parts of the curriculum then moves to the occupationally-specific transferable skills then to the basic transferable skills. The resource implications for the strategy are considerable and outstandingly important among these will be the staff development needs of teachers whose task it will be to deliver transferable skills.

Bibliographic details

TD/TNC 14.15

THOMSON, P. and MURPHY, J. (1987)

Transferable skills in technical and further education. Adelaide: TAFE National Centre for Research and Development.

53 p.

ISBN 0-96397-131-8

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse).

Price: \$7.95 (Hard copy); Free (M-fiche)

Co-operative programs between TAFE and schools: Part 1 — New ways, new challenges (Video). Part 2 — Approaches (Video).

Z. Krzemionka

Funded by the Commonwealth Department of Education, the Commonwealth Schools Commission and Commonwealth Tertiary Education Commission.

These two videos describe the nature of the co-operation between TAFE and schools, resulting in the provision of a broader range of curriculum choice for students in years 11 and 12. 'New ways, new challenges' describes co-operative programs and how they have been established, their structure and scope. 'Approaches' portrays four co-operative programs, each developed individually in order to meet the needs of students. It is suitable for staff involved in planning such programs.

Bibliographic details

TD/TNC 14.4

TD/TNC 14.5

KRZEMIONKA, Z (1987)

Co-operative programs between TAFE and schools: Part 1 — New ways, new challenges: Part 2 — Approaches. Adelaide, TAFE National Centre for Research and Development.

Video, Part 1: 20 minutes ISBN 86397-027-3

Video, Part 2: 20 minutes ISBN 86397-035-4

Availability: Video (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001.)

Price: Part 1 \$24.00

Part 2 \$24.00

Australian experiences in providing training and re-training to adults who seek employment and re-employment in the wake of rapid technological development, taking in to full account all aspects of general education

W.C. Hall and staff of the Centre

Funded by UNESCO

Throughout the paper, the term 'adult' implies those of 18 years of age or older (ie those who are legally adult in Australia), 'training' includes vocational education, and 'technological development' includes new technology (including information technology). The paper covers the areas outlined below.

The first section provides a.n overview of Australian vocational education and training. In the second section, 'Australian commerce/industry', an overview of the present industrial picture is given with special reference to training. There is an emphasis on new technology in the third section of the report. A case study is then presented in the fourth section dealing with the changes required in the engineering technical workforce.

Future needs of industry are discussed in the fifth section with special reference to generic skills. The Australian Federal Government is financing a wide range of special equity programs (the sixth section) including those for Aboriginals, women and the unemployed. Finally, the paper describes the training and re-training of trainers, but especially discusses the problems that TAFE College vocational lecturers face in keeping in touch with developments in industry and commerce.

The paper includes several edited extracts taken from TAFE National Centre for Research and Development reports which have been published during the past two years. The authors of these reports are shown in the references and are acknowledged at the end of the report.

Bibliographic details

TD/TNC 14.22

HALL, W.C. (1987)

Australian experiences in providing training and re-training to adults who seek employment and re-employment in the wake of rapid technological developments taking in to full account all aspects of general education. Adelaide: TAFE National Centre for Research and Development.

40 p.

Format: M-fiche

Availability: M-fiche (National TAFE Clearinghouse)

Price: Free (M-fiche)

4. Commissioned research

TAFE curriculum research: a review of group process methods — summary

T. Anderson and N. Jones

This project examines ways in which technical and further education curriculum research can be speeded up in the data collection and analysis phases. After discussing the need for preliminary investigation, the study describes and analyses the following research procedures: exploratory (qualitative) research, the Search Conference Method, the DACUM (developing a curriculum) Method and derivatives of DACUM, the Nominal Group Technique, the Delphi Method, the Critical Incident Technique and Force Field Analysis. The methods were chosen after reviewing the literature and research methods used in TAFE.

Each method has been presented with the aim of providing intending users with sufficient information about the applications of the method, the data produced, how the method is used, and what are its pitfalls. Where possible, details of duration, cost, time and resources needed, have been included. Since these methods provide different perspectives on occupational analysis and therefore yield different types of data, some ways in which they can be used in combination are covered. A guide to the selection of the methods is provided.

The planning and implementation of curriculum group process methods are summarised in terms of the value orientations (overarching principles which guide choices between alternatives) and social rules (practical guides for action) which a group facilitator may adopt. A model of the general stages and steps in planning and conducting curriculum research workshops is included. Some issues which arise in the use of group process methods, such as strategies for 'conflict resolution', are highlighted.

Appendices cover some questionnaire methods for occupational analysis, a program for a short Search Conference, a brief description of an observational method for the study of skill masters, and some examples of DACUM charts.

The methods reviewed offer, in varying degrees, ways of shortening curriculum research and the data analysis process. The Search Conference, Delphi and exploratory methods and, to a lesser extent, the Nominal Group Technique (NGT) hold promise for providing data to enable curriculum to be adapted to occupational structural change. The NGT method appears to offer a useful approach for identifying the issues to be addressed in curriculum development and is a useful 'conflict resolution' procedure in certain situations.

The DACUM method, regarded as a quick and effective means for analysing occupational education needs at the psycho-motor level, holds promise, when linked to Delphi-type processes, of providing data in the cognitive domain (eg central educational concepts and the knowledge/skills needed to carry these concepts into effective task performance on the job). DACUM is also promising for detailing 'the here and now' of work functions but, in its traditional form, appears less effective, compared with the Search Conference, Delphi and exploratory research, in detecting change within occupations. DACUM, therefore, may need to be linked to other methods more sensitive to changes when used as a curriculum research procedure on occupations undergoing structural change. Or it may need to include an additional segment which looks at trends within the occupation, possibly at the end of the DACUM session.

The Critical Incident Technique is seen as offering advantages in curriculum research for short courses, especially where urgent information is sought on the immediate, practical knowledge needed by students. It can also be used in assessing what 'critical' knowledge

needs to be included in a course for assessing students' perceptions of the relevance of a program to their needs.

Force Field Analysis, since it enables a planning group to highlight the strengths and weaknesses of the forces affecting the implementation of change, appears best suited for use as an adjunct to other group process methods or in teacher workshops examining how occupational data can be translated into a curriculum.

Bibliographic details

TD/TNC 13.10

ANDERSON, T. and JONES, N. (1986).

TAFE curricula research: a review of group process methods — summary. Adelaide: TAFE National Centre for Research and Development.

48 p

ISBN 0-86397-385-X

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse).

Price: \$8.95 (Hard copy); Free (M-fiche)

TAFE curriculum research: a review of group process methods — research design

N. Jones & T. Anderson

This project set out to examine data collection and analysis methods applicable by TAFE authorities in Australia for the purposes of course design and review. The intention was to document those methods currently used by TAFE practitioners as well as methods used by researchers working either in other education areas or in entirely different areas.

The goal was to then evaluate the research methods using criteria pertinent to the concerns of TAFE authorities, sound curriculum development practices and the interest of TAFE students. In particular, a major criterion was speed of method in data collection and analysis.

Methods evaluated favourably were to be refined if possible, in accordance with the qualities characterised by the evaluation criteria, and to be documented in detail and presented for use by TAFE practitioners as a resource bank of research methodologies. The aim was to provide for each research method in the resource bank, the following information:

- description of method;
- human and material resources required to use the method effectively;
- suitability of the method to particular TAFE study areas, target populations, occupational areas, or curriculum problems as appropriate;
- how to use the method (a procedural model);
- personal and professional skills required to use the method;
- constraints and pitfalls to be considered in using the method.

The study was originally designed to cover the three dimensions listed below.

1. Research dimension: the identification, documentation and comparison of different data-gathering and analysis methods.
2. Evaluation dimension: the assessment of the utility of these data-gathering and analysis methods in respect of specified criteria.
3. Development dimension: the development, refinement and improvement of selected methods for presentation as an item in a resource bank of methods.

Due to a number of factors outside the control of the researchers, empirical data sufficient to evaluate the methods were not obtained. The evaluation of the methods was therefore based on a literature search and on appraisal of relative strengths and weaknesses of the methods, taking into account the experience of those who had used the methods in TAFE.

Bibliographic details.

TD/TNC 13.12

JONES, N. and ANDERSON, T. (1986)

TAFE curriculum research: a review of group process methods — research design. Adelaide: TAFE National Centre for Research and Development.

28 p.

ISBN 0-86397-353-1

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse)

Price: \$6.95 (Hard copy); Free (M-fiche)

TAFE curriculum research: a review of group process methods — descriptive bibliography

N. Jones, T. Anderson, D. Dawson and R. Dowling

During their investigation of TAFE curriculum research the authors located many useful publications of interest to curriculum researchers. This bibliography lists these publications and includes a brief summary of each. The bibliography includes publications which relate to ways of speeding up the data-collection and analysis phase of curriculum development and those which relate to quantitative research methods.

Bibliographic details

TD/TNC 13.11

JONES, N., ANDERSON, T., DAWSON, D. and DOWLING, R. (1986)

TAFE curriculum research: a review of group process methods — descriptive bibliography.

Adelaide: TAFE National Centre for Research and Development.

26 p.

ISBN 0-86397-369-8

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse).

Price: \$6.50 (Hard copy); Free (M-fiche)

Evaluation of TAFE programs

J. Foyster, H. Guthrie, B. Stock, D. Smart and P. Thomson.

Funded by the Office of the TAFE Board, Victoria.

In 1985-1986, two projects were commissioned by the Victorian TAFE Board to describe existing practices and propose alternative methodologies for the evaluation and validation of TAFE programs. One of these projects (Validation of TAFE programs) was based at the Royal Melbourne Institute of Technology and began in late 1985. The other project, beginning early in 1986, was co-ordinated by the National Centre. The two projects shared an advisory committee.

The projects' aims were to:

- define the terms 'evaluation' and 'validation' as they might apply to programs in 1 000, 2 000, 3 000 and 4 000 streams in both accredited and non-accredited programs;
- search the literature with respect to methodologies applicable to the TAFE teacher;
- outline models and methodologies and recommend their application to particular programs;
- recommend procedures and strategies that will assist the maintenance of quality control in TAFE programs.

The aims were met by producing a series of 20 discussion papers, entitled *Making Changes*. These papers aimed to raise issues and to provide a basis for a more informed debate about evaluation and validation. Extensive consultation took place with many individuals and groups. The final report (paper 21 in the *Making Changes* series) proposed 15 recommendations which are presently being considered by Victorian TAFE.

The study started with the assumption that evaluation and validation are valuable processes aimed at improving program relevance and quality. The reports suggested that the processes needed to be built into TAFE processes and be on-going. Stop-start curriculum development and review were not seen to be appropriate. Teachers were the group who would be most involved in the evaluation and validation of programs. Therefore, the introduction of on-going processes would have important implications for their staff development and for teaching terms and conditions. In particular, teachers needed to have the time these on-going processes would take be recognised as part of their normal duties. These project proposals therefore have resource implications.

No one method of evaluation or validation was recommended. A variety of approaches was seen to be needed. Also, consultation with those within and outside TAFE who have an interest in a particular program should be on-going. Effective mechanisms for doing this need to be found, or shared. Appropriate safeguards and standards in the procedures adopted are needed to ensure that rights are protected and the processes have credibility. Finally, evaluation and validation, although old terms, are relatively new processes in any formal sense in Victorian TAFE. Therefore it will be impossible to introduce the processes widely and quickly without a considerable resource input. A phased introduction is favoured.

A follow-up project, entitled *Evaluation and validation of TAFE programs implementation of methodologies* is being conducted by the TAFE National Centre in 1987.

Bibliographic details

TD/TNC

FOYSTER, J, GUTHRIE, H., STOCK, B., SMART, D. and THOMSON, P. (1986)
Making Changes — Evaluation and Validation of TAFE Programs. Papers 1-21. Melbourne:
Office of the TAFE Board.

95 p

Format: Hard copy; M-fiche

Availability: Hard copy and M-fiche (Victorian TAFE Clearinghouse).

Price: Free

A curriculum outline for teaching Australian sign language (Auslan) as a second language

T.A. Johnston

This teacher's resource is intended to be used with two companion volumes (both described in this *Digest*). The first is a dictionary — *A Preliminary Signing Dictionary of Australian Sign Language (Auslan)*. The second is a grammar — *A General Introduction to Australian Sign Language (Auslan)*. Both were also written by the author of this volume for the TAFE National Centre for Research and Development.

It is not intended that these works be used as substitutes for instruction. The student of Auslan (as with any language) cannot simply pick up the dictionary or the grammar and expect to teach him or herself how to sign. He or she will need to attend a sign class. The inexperienced or untrained teacher of Auslan cannot likewise simply pick up this teacher's resource and start teaching. Though it will hopefully give these teachers many ideas, they, too, will need to attend inservice or training classes where the material in this volume is covered.

Bibliographic details

TD/TNC 14.17

JOHNSTON, T.A. (1987)

A curriculum outline for teaching Australian sign language (Auslan) as a second language.

Adelaide: TAFE National Centre for Research and Development.

140 p.

ISBN 0-86397-090-7

Format: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001)

Price: \$6.50 (Hard copy)

A general introduction to Australian sign language (Auslan) **T.A. Johnston**

Research into Auslan has only just begun. The signs presented here represent a synthesis of observations made of other sign languages and observations made of Auslan directed in the light of the foreign literature. This has been considered a valid approach to take for two major reasons. First, the author is a native signer (though hearing) and a linguist. Furthermore, the truth of some observations from American Sign Language (ASL), British Sign Language (BSL), or Langue des Signes Francaise (LSF), are often transparent when applied to Auslan. In others observation and analysis has been used to confirm or deny foreign observations. Second, there has been a lack of research into Auslan. Educators and teachers of the deaf in Australia have, until very recently, and then seemingly only in response to pressure from the deaf community, shown an interest to assimilate research into sign language conducted in Europe and the United States and to explore its applicability here. From this beginning it is hoped that studies in Auslan will acquire a basis from which to work.

Thus the account of Auslan presented here is essentially derivative. The dearth of research into Auslan together with the recent upsurge of interest in signing has made it imperative that information on Auslan, no matter how general, is made available as soon as possible. There is no doubt that further research will reveal aspects of the syntax of Auslan that have not been described here and indeed that some of the observations made in this first description may need to be qualified.

This volume is intended as a non-technical general introduction to Auslan. Consequently, constant reference to and citation of sources has not been made throughout the text. For those familiar with sign language research it will be obvious that certain seminal works in that literature have inspired this current work.

Bibliographic details

TD/TNC 14.19

JOHNSTON, T.A. (1987)

A general introduction to Australian sign language (Auslan). Adelaide. TAFE National Centre for Research and Development.

180 p.

ISBN 0-86397-106-7

Format: Hard copy

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001)

Price: \$7.95

A preliminary signing dictionary of Australian sign language (Auslan)

T.A. Johnston

This dictionary contains a selection of the signs of Australian sign language (Auslan) with accompanying English word equivalents and explanation of many of the signs' meanings. Each sign entry also contains information regarding its manner of execution, its etymology (where known) and/or its real or imagined origins.

Apart from the small signing manuals produced over the years by adult deaf societies, religious groups or educational institutions, there has never before been a dictionary which has attempted to record the sign language of the Australian deaf community.

As with most other attempts to deal with sign language or communication with the deaf this dictionary's primary aim is educational. However, it differs from many other approaches in that this dictionary aims to teach hearing people about sign language, not to teach deaf people English or to consciously tamper with their sign language.

The dictionary serves as a resource and is no substitute for learning sign language from a native signer. In recent years, many hearing people have learnt a form of Signed English under the mistaken impression that it was the same as the sign language of the deaf community. Both these well-intentioned hearing people and the signing deaf community have been disappointed, if not upset, by the confusion that has resulted.

This dictionary is the first step towards providing learners with the kind of information they will need to mix and communicate comfortably in the signing deaf community.

Bibliographic details

TD/TNC14.18

JOHNSTON, T.A. (1987)

A preliminary signing dictionary of Australian sign language (Auslan). Adelaide: TAFE National Centre for Research and Development.

627 p.

ISBN 0-86397-098-2

Format: Hard copy

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001)

Price: \$24.00 (Hard copy)

A study of apprentice learning with respect to the impact of in-plant training centre experience and acceleration

R.L. Hayes, K.E. Eckersall and J.J. O'Sullivan

This study replicates a similar one based on the 1983 apprentice intake in the fitting and machining, electrical, sheetmetal and motor mechanics trades, where a large sample was investigated to determine whether there were any differences in performance between apprentices trained in off-the-job, in-plant training centres and those trained on-the-job.

Using a 1984 intake sample of over 500 apprentices, and with the co-operation of 16 in-plant training centres and TAFE Colleges, this study attempted to confirm and consolidate the findings of the previous study. The trades involved — fitting and machining, electrical, sheetmetal and motor mechanics — are the same as in the previous investigation.

Major intentions were to:

- (i) investigate the effectiveness of off-the-job, in-plant training centre apprentice training compared with training received by apprentices employed on-the-job;
- (ii) investigate the benefits of accelerated apprentice training programs;
- (iii) qualitatively compare training centre facilities and programs.

In fitting and machining, the findings of the previous study were generally confirmed. Overall, off-the-job training centre apprentices develop higher levels of practical skills than on-the-job apprentices. Accelerated apprentices attached to training centres show superior levels of skill development compared with non-accelerated apprentices either in a training centre or employed on-the-job. However, significant differences in skill levels were not found between non-accelerated groups, whether attached to training centres or employed on-the-job.

In electrical, results were affected by a syllabus change — virtually all electrical apprentices involved in the study were in non-accelerated programs. No significant difference was found between the practical test scores of training centre and on-the-job apprentices.

In sheetmetal, the previous study's tentative findings were confirmed. On-the-job apprentices generally work faster than training centre apprentices on their TAFE College modules. However, it is now considered that the nature of training centre influence and the type of employment (eg aircraft versus general sheetmetal) affect TAFE College 'work rate'.

No effective measure was devised for the purpose of comparing motor mechanics apprentice groups due to program variations and training pattern inconsistencies.

Variation between nature and quality of training centre programs, training centre facilities, and training centre-TAFE College liaison were found to be very important influences on apprentices' learning.

This investigation is to be seen as part of a longitudinal study of apprentice training methods within the trades involved. The study's results have implications for apprentice training policies of groups such as governments, private and government employers, training authorities, and the TAFE system.

Bibliographic details

TD/TNC 12.13

HAYES, R.L., ECKERSALL, K.E. and O'SULLIVAN, J.J. (1986)

A study of apprentice learning with respect to the impact of in-plant training centre experience and acceleration. Adelaide: TAFE National Centre for Research and Development.

116 p.

ISBN 0-86397-161-X

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse)

Price: \$12.95 (Hard copy); Free (M-fiche)

Teaching mathematical trade topics for conceptual understanding

A. Larkin and K. Phillips

Teachers of trade courses frequently find that their students have difficulty in solving problems associated with more abstract topics. When this occurs the teacher needs to become a teacher of mathematics, as well as a teacher of the trade concerned.

The authors believe that many such difficulties arise because the students, in their previous courses, have become skilled at the various operations and processes without really understanding what they are doing. Their skills have enabled them to 'pass' examinations based on exercises with which they are familiar. However they have difficulty in applying their knowledge to unfamiliar situations such as those they meet on the job. The solution to the problem is to start the students thinking about what they are really doing when they perform some mathematical skill.

The report's first objective is to illustrate how to analyse a mathematical topic by identifying its component facts, skills, strategies and concepts. A method suitable for teaching each of these elements is suggested. However the process of analysing a topic using this or any other classification scheme should not be allowed to interfere with the primary consideration, which is to provide an adequate quantity and quality of learning experiences for the students to achieve adequate understanding.

Before a trade problem can be solved mathematically it must be expressed using mathematical language. This translation process is called modelling. After a solution has been found it has to be translated back from the mathematical form into everyday terms. This process is referred to as interpretation.

Students frequently have difficulties because elementary mathematics courses emphasize the process of finding a solution. Students are given precisely enough information to find a solution and the problem cannot be solved if insufficient information is provided. Teachers of trade mathematics must consider the modelling of their problems in mathematical terms, as well as the interpretation of the solution, because these aspects may be new to their students.

The second objective is to show how to incorporate this view of a problem solving process into the teaching methods, by identifying the modelling, solving and interpretation stages in the analysis of a problem.

Bibliographic details

TD/TNC 13.3

LARKIN, A. and PHILLIPS, K. (1986)

Teaching mathematical trade topics for conceptual understanding. Adelaide. TAFE National Centre for Research and Development.

74 p.

ISBN 0-86397-249-7

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse).

Price: \$10.50 (Hard copy); Free (M-fiche)

Trading tradition: an evaluation of the experiences of female apprentices in male-dominated trades in the Hunter Region of New South Wales

P. Moran and members of the NSW Department of TAFE, Women's Coordination unit

In Australia, efforts to achieve equal opportunity for women in, and through, vocational education have taken many forms, including:

- measures to improve the quality of vocational education in traditionally female areas of study and work;
- measures to expand career choices of women through vocational guidance and counselling;
- measures to improve women's participation and performance in technical subjects such as mathematics, physical sciences and computer studies;
- measures to enhance professional competence in non-sexist education through staff development;
- measures to improve the confidence and self-esteem of women;
- measures to create a positive or 'girl-friendly' teaching/learning environment, including the elimination of sexual harassment and the introduction of child-care services;
- measures to break down the sex-segregation in vocational education or in the labour market.

This report is an evaluation of measures taken in the Hunter Region of New South Wales to promote the entry of women into non-traditional trades, that is, of measures to overcome the significant problem of a sex-segmented labour market and its associated vocational education system.

It is a valuable report in two ways. Firstly, it points to the necessity of including evaluative measures as an integral part of any strategy to achieve equal opportunity for women. Such strategies are still experimental. For future policy and practice we need to know more about what works, what doesn't and about the intended and unintended consequences of planned intervention in the labour market and the educational process.

Secondly, the findings of the report and its conclusions should be noted by those in education, training and employment spheres, for they have important implications for policy, for practice and for further research.

This report concludes that:

- apprentices of both sexes faced problems because they were apprentices;
- female apprentices faced particular problems in their access to and experience in, the non-traditional trades because of beliefs about the role of females in society. For example, information on trade-training opportunities was hard to obtain and harassment was not uncommon;
- the data did not support some commonly held beliefs about the suitability of females to the trades, for example, that females cannot physically cope with heavy work; that they don't like dirty or noisy work.
- certain practices, designed to reduce the particular problems female apprentices faced, created the appearance of 'special attention' for the female apprentices and had negative consequences. The female apprentices did not want to be viewed as 'different' from the

males. The male apprentices were hostile towards what they viewed as discriminatory practices. This hostility served to exacerbate the day-to-day problems that the female apprentices faced at work and at college.

Bibliographic details

TD/TNC 12.15

MORAN, P., et al (1986)

Trading tradition: an evaluation of the experiences of female apprentices in male dominated trades in the Hunter Region of New South Wales. Adelaide: TAFE National Centre for Research and Development.

273 p.

ISBN 0-86397-201-2

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse)

Price: \$24.50 (Hard copy); Free (M-fiche)

A summary report is also available. (TD/TNC 12.19).

Australian practices in crediting the previous training and experiences of mature-aged students in formal TAFE courses

F. Strachan and P. Thomson

This paper was prepared at the request of the TAFE Directors and seeks to:

- identify some aspects of credit granting with reference to recent overseas practices in the UK and USA;
- survey current practices of Australian training bodies in granting credit;
- outline some possible options for the implementation of a credentialling process.

There are four areas of current credit granting practices which the paper suggests TAFE should consider.

1. Firstly, there is a need to initiate action which will overcome the problem of trades and vocations not covered by the Tradesmens Rights Regulations Act (TRRA) or the relevant Council of Overseas Professional Qualifications (COPQ) committees. These trades and vocations are poorly served at present.
2. Secondly there is a need to evaluate the existing procedures for granting credit. This evaluation would provide answers to questions such as:
 - whether there is merit in placing limits on the amount of credit that can be obtained in any course;
 - whether there is merit in placing limits on the time a student has to apply for credit after earlier obtaining a formal qualification;
 - what influence the increasing number of trade courses with a nationally-agreed common core curriculum has had on the policies for granting credit;
 - what the level of demand is for credit and exemption, and whether it varies between the states and territories and, if so, for what reasons;
 - what effect a sudden rush of applicants (created, for example, through an advertising campaign) would have on the existing system;
 - what needs to be done to improve the validity of the existing trade tests;

In short, the TAFE Directors need more information about a variety of issues such as those identified above before they can feel confident in their role of decision makers. A full scale research effort is called for to gather this information.

3. As well as evaluating what is happening at the moment, consideration needs to be given to alternative procedures such as those operating in the UK and USA. So an additional task will be to consider how applicable national groups set up along the lines of Educational Counselling and Credit Transfer Information Service (ECCCTIS) and Credit Accumulation and Transfer Scheme (CATS) (pp 3-5) would be for this country. There should also be a consideration of a regional consortium model such as Compact of Lifelong Educational Opportunities (CLEO) (pp 5 and 6 and an assessment of its viability).

Essentially the options for granting credit for previous training and experience are using:

- college-based procedures independently developed to meet local needs;
- college-based procedures co-ordinated on a regional or state basis using a consortium approach;
- state or territory-based procedures operated centrally by the TAFE authority in partnership with other agents, eg Local Trade Committees;

- nationally co-ordinated procedures operated in conjunction with other agents (eg Central Trade Committees) and a national clearinghouse which provides details on the different systems for the purpose of interstate comparability.

Certain overlapping between these options is also possible, for example the clearinghouse idea could operate equally well at a state or regional level.

Studies of these alternatives will need to include cost-benefit analyses as well as a judgement on the educational merits of the alternatives.

4. Finally, there is a need to develop and pilot a set of methods for assessing non-sponsored experiential learning.

Bibliographic details

TD/TNC 14.7

STRACHAN, F. and THOMSON, P. (1987)

Australian practices in crediting the previous training and experiences of mature-aged students in formal TAFE courses. Adelaide: TAFE National Centre for Research and Development.
26 p.

Format: M-fiche

Availability: M-fiche (National TAFE Clearinghouse)

Price: Free (M-fiche)

DACUM (Video)

WA Dept. of Education, Division of TAFE and Australian Information Videos.

A committee established by WA TAFE has guided the production of a videotape on the DACUM (Developing A Curriculum) method of designing vocational curricula. The video explains the various elements of the DACUM process and shows an actual session in progress.

Bibliographic details

TD/TNC 14.10

WESTERN AUSTRALIA DEPARTMENT OF EDUCATION, Division of TAFE and Australian Information Videos (1987).

DACUM. Adelaide: TAFE National Centre for Research and Development.
17 mins.

ISBN 0-86397-281-0

Format: Video

Availability: Video (Thomas Nelson, P.C. Box 4725, Melbourne, Vic. 3001)

Price: \$24.00

Computer assisted learning in basic adult education

R. Wilson and P. Hooper

The goal of this project was to review the use of computer assisted learning (CAL) in adult basic education and to gauge awareness of the potential for the integration of this teaching resource into learning programs. The more specific aims were:

- (1) to establish an information network of practitioners working within TAFE Australia, who have an interest in basic adult education;
- (2) to collate a human resources directory and a register of computer hardware and software materials presently in use within institutions of TAFE throughout Australia;
- (3) to prepare and disseminate an information bulletin/newsletter that would assist practitioners in their use of CAL in basic adult education;
- (4) to select and evaluate computer software packages presently in use in basic adult education throughout Australia.

Recommendations in the report included the following:

- that adult education authorities, including TAFE, should develop strategies for the implementation of CAL in basic adult education;
- that state authorities should provide capital grants to literacy/numeracy programs for the provision of suitable hardware and software computer resources. Funding allocations should include significant staff development resources and software preparation time;
- that local networks of users be established to support individuals as they develop new skills and attitudes towards CAL in basic adult education;
- that software evaluation exercises should be undertaken by local user networks rather than large national projects. Packages should be reviewed quickly to aid in the decision about further purchases, while detailed evaluation should be done in consultation with students and teachers over a longer period of time. Evaluations can only be successful if long-term trialling is included;
- that a national user information network should be encouraged through the recently released newsletter TAFE Computing Notes. The TAFE National Centre should continue as a central clearinghouse for information related to CAL.

Bibliographic details

TD/TNC 14.2

WILSON, R. and HOOPER, P. (1986)

Computer assisted learning in basic adult education Adelaide. TAFE National Centre for Research and Development.

Resource Kit

ISBN 0-86397-018-4

Format: Hard copy

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001).

Price: \$24.00

5. Seed research

A preliminary survey of the demand for laser technicians in the Melbourne Metropolitan Area

I. Cameron

This report presents the results of a survey carried out:

- to identify the extent of training currently provided for laser technicians/laser maintenance personnel by industry, TAFE and other relevant sources in Victoria. This involved identifying:
 - accredited courses, short courses and seminars offered to laser technicians/laser maintenance personnel;
 - the nature and extent of inservice technician training offered by industrial organisations and professional associations;
 - the nature and extent of training and product orientation offered by equipment suppliers.
- to determine the current and expected requirements for laser technicians/laser maintenance personnel to satisfy the needs of industrial and research institutions.

Bibliographic details

TD/TNC 14.9

CAMERON I. (1987)

A preliminary survey of the demand for laser technicians in the Melbourne Metropolitan Area. Adelaide; TAFE National Centre for Research and Development.

39 p.

Format: M-fiche

Availability: M-fiche (National TAFE Clearinghouse)

Price: Free.

Computer integrated manufacture: directions, emphases, implications
NSW Department of TAFE, School of Mechanical Engineering

This seed project has been undertaken by Systems, Fluids and Automation Pty. Ltd. for the NSW Department of TAFE.

This report opens with a discussion of what is meant by the term Computer Integrated Manufacture. It then moves on to examine the individual hardware components of a system, the concepts and software tools by which integration is achieved and the impact this integration is likely to have on Manufacturing Operations Management. The final chapter presents conclusions and recommendations relating to the future TAFE educational program in manufacturing.

Bibliographic details

TD/TNC 12.18

NEW SOUTH WALES DEPARTMENT OF TAFE, School of Mechanical Engineering.
(1986)

Computer integrated manufacture: directions, emphases, implications. Adelaide: TAFE National Centre for Research and Development.

52 p.

ISBN 0-86397-217-9

Format: Hard copy; M-fiche

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001); M-fiche (National TAFE Clearinghouse).

Price: \$8.50 (Hard copy); Free (M-fiche)

6. Miscellaneous publications

Education and training: some lessons from England W.C. Hall

In this report, the tensions between 'education' and 'training' are described, with particular reference to the relationships between England's Department of Education and Science and the Manpower Services Commission. The lessons drawn from England are then applied to Australia, especially to the relationship between our Department of Employment and Industrial Relations and Technical and Further Education.

Bibliographic details

TD/TNC 13.9

HALL, W.C. (1986)

Education and training: some lessons from England. Adelaide: TAFE National Centre for Research and Development.

22 p.

Format: M-fiche

Availability: M-fiche (National TAFE Clearinghouse)

Price: Free

Trade mathematics: a handbook for TAFE teachers **J. Thiering, J. McLeod and S. Hatherley**

In 1983 and 1984 the NSW Department of TAFE's Staff Development Division presented a series of trade mathematics workshops for teachers from several trade areas: Carpentry and Joinery, Plumbing, Automotive Engineering and Fitting and Machining. The emphasis was on teaching mathematics in normal lessons rather than on remediation techniques.

Separate workshops were developed for each trade. Trade teachers had preliminary meetings with the course presenters to discuss the areas which they thought were most difficult for students. The topics raised in these discussions were remarkably similar, so that common themes emerged: decimals, percentages, estimation, teaching concepts, formulas, written calculations and solving problems. These were combined into four workshop sessions with some changes from one trade to another. Matching notes were written as handouts for the teachers attending the workshops, each set being adapted using specific trade examples taken from student assignments, examination papers and textbooks. An underlying assumption was that students would be using calculators for most of their trade calculations.

This handbook is a sample package of the materials prepared for the trade mathematics workshops. It has been put together by combining the notes used for the four trade areas and therefore contains a mixture of trade applications. Some chapters have worksheets which teachers will be able to use for class exercises, homework assignments or tests, without breach of copyright.

The principles emphasised in the book are; teaching for understanding of concepts; keeping calculation as straightforward as possible; and applying problem-solving techniques in all contexts.

Bibliographic details

THIERING, J., MCLEOD, J. and HATHERLEY, S. (1987)

Trade mathematics: a handbook for TAFE teachers. Melbourne: Thomas Nelson.

63 p.

ISBN 17-006895-1

Format: Hard copy

Availability: Hard copy (Thomas Nelson, P.O. Box 4725, Melbourne, Vic. 3001)

Price: \$12.95

7. Regular publications

- *Annual Report*;
- *Education and Labour Force Trends* (produced annually);
- *Australian Journal of TAFE Research and Development* Vol. 2, Nos 1 and 2, November 1986 and May 1987;
- *Initiatives in Technical and Further Education* Nos 12 and 13, September 1986 and March 1987;
- *Traineeship Newsletter* Nos 5, 6 and 7, July and September 1986 and January 1987;
- *Australian TAFE Computing Notes* Vol. 1, Nos 2 and 3, July and November 1986;
- *Research and Development Digest*, No. 1, September 1986;
- *TAFE Projects in Progress*, Nos 10 and 11, November 1986 and May 1987.

8. Current research

At the start of the 1987/1988 financial year, the following Centre projects were being conducted. Other projects will be started as the year progresses. To keep informed of all current projects, please refer to the Centre publication *Projects in Progress* (published twice yearly and available in college libraries).

Project Profiles on each project are available (free of charge) from the Centre.

In-house projects

Australian Journal of TAFE Research and Development.

Experiential Learning

An investigation into the implementation of national core curricula

The continuing education needs of academic staff: senior college staff in TAFE

The continuing education needs of academic staff: beginning TAFE teachers

Training and retraining in hitech manufacturing techniques

TAFE industry partnership: towards more effective relationships in course development and implementation (Partly outside funded)

Trends in engineering technical workforce occupations

Cross crediting between TAFE and higher education

Rural education needs

Outside funded projects

TAFE/schools programs and credential

Mathematics beyond the classroom

National feasibility study of alternative training approaches in the printing industry

Manual on training needs, analysis, methodologies

Computer managed learning: a monograph

Evaluation and validation of TAFE programs Implementation of methodologies

Transferable skills — integration into the curriculum

Distance education for 16-20 year olds

Evaluating instruments for Australian Traineeship Scheme

Oil industries evaluation — welders

Commissioned projects

Adult education in traditionally-orientated Aboriginal communities

Attrition of part-time TAFE certificate students (completed and awaiting publication)

Evaluation of competency-based vocational education program, Part II

New versions of the Australian second language proficiency rating (ASLPR)

Institutional trade training

TAFE software standards

Access course on Australian studies from non-English speakers

Evaluation of NSW NOW courses

TAFE indicators bulletin

Assessment in adult literacy

Planning approaches to multi-purpose facilities in TAFE
Development of a territory management information service
Physical modelling of CIM processes
Vocational education needs of the disabled
Measurement of facility utilisation
Review of community participation in TAFE
Development of strategies for prevention of occupational injury
Ways and means of promoting shared facilities between TAFE and industry
Marketing TAFE
Assessment procedures clearinghouse
Women, work and training lessons for Australia from overseas experiences
Seed research
The influence of industry and academic experiences on TAFE teacher training
Progress — TAFE to CAE qualifications in library information studies
An approach to the training of TAFE teachers
Coalmine management training
Design and construction of classical furniture
Investigation into literacy and numeracy needs — electrical mechanics apprentices, Victoria
Study of the interactional process and outcomes of the selection interview
An investigation of the science content of trade curricula