

Sustaining the skill base of technical and further
education institutes: TAFE managers' perspectives

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The views and opinions expressed in this document are those of the author/project team and do not necessarily reflect the views of the Australian Government, state and territory governments or NCVER

Publisher's note

Additional information relating to this research is available in *Sustaining the skill base of technical and further education institutes: TAFE managers' perspectives—Support document*. It can be accessed from NCVER's website <<http://www.ncver.edu.au>>.

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The author/project team were funded to undertake this research via a grant under the National Vocational Education and Training Research and Evaluation (NVETRE) program. These grants are awarded to organisations through a competitive process, in which NCVER does not participate.

The NVETRE program is coordinated and managed by NCVER on behalf of the Australian Government and state and territory governments, through the Department of Education, Science and Training. This program is based upon priorities approved by ministers with the responsibility of vocational education and training (VET). This research aims to improve policy and practice in the VET sector. For further information about the program, go to the NCVER website <<http://www.ncver.edu.au>>.

ISBN 1 920896 75 9 print edition
1 920896 76 7 web edition

TD/TNC 82.08

Published by NCVER
ABN 87 007 967 311

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Acknowledgements

The project team would like to thank the chief executive officers, the educational managers and the human resource managers in the 16 TAFE institutes who participated in this study. Although they are not named in the report, we hope that they recognise the valuable contribution their perspectives have made to this report.

The authors also acknowledge the valuable input provided by the project reference group: Lesley Holland, Rod Brightman, Hugh Guthrie and John Mitchell. Further thanks are also extended to Alex Ma for his analysis of the data and to the team who conducted interviews across Australia—Cathy McNickle, Kaaren Blom, Gary Edwards, Sue Roy and Patricia Hyde.

Key messages

- ✧ Australia's technical and further education (TAFE) institutes have an ageing teaching workforce, whose impending departure endangers the institutes' skill base. This is at a time when workplace change demands (from TAFE and the broader vocational education and training [VET] sector) a more highly skilled teaching workforce than ever before. TAFE institutes greatly depend on the vocational competency of their teachers—their technical competency and currency, comprehensive industry know-how, networks and high-level teaching skills—to maintain and build their credibility.
- ✧ Retaining, developing and renewing TAFE institutes' organisational capability involves planned recruitment, and the retention of key mature teaching staff through appropriate incentives and arrangements. More commitment is needed to targeted training and re-training, as well as to strategies which help share the critical knowledge that is otherwise lost as highly experienced teachers leave.
- ✧ TAFE institutes need to draw more upon similar experiences and processes used in other sectors and organisations to maintain their skill base. Such approaches need to be properly resourced, and supported by funding bodies, policy-makers, TAFE management and teachers.

Executive summary

Global competition, changes in technology and market regulation are driving change throughout the world and Australia. We struggle to define these changes within systems we know—describing new work, new work structures and new workers within the new economy, the knowledge economy or the innovation economy. Some who work to make sense of these changes have an even greater responsibility—of training people to live and work in this changed world while they simultaneously deal with change in their own lives.

This is the challenge to those teaching in the vocational education and training (VET) sector in Australia. For the past ten years the sector has undergone continuous reformation to enable it to undertake its growing responsibilities. A competitive training market has opened up. Training packages have been implemented to give both an industry and a national emphasis to training. Training has moved into workplaces, and uses new technologies and flexible approaches to meet the needs of diverse learners. Technical and further education (TAFE), as the largest component of the VET system in Australia, has been greatly affected by these developments.

However, yet another change has been slowly incubating, and has already started its comprehensive influence—demographic change. Natural population growth is slowing and the proportion of mature age people is increasing. TAFE institutes already have an older teaching workforce than the Australian workforce overall. They face the prospect of losing a highly experienced section of the teaching workforce over the next three to five years. This will be exacerbated by difficulty in obtaining skilled replacements. Forecasts are that this new demography could result in the erosion of critical organisational knowledge within TAFE institutes, as in other organisations and industries. For TAFE, this could threaten training capacity and credibility, and leave TAFE institutes struggling to meet their increasingly important obligations to provide training to the broader Australian workforce.

To find out how TAFE institutes are responding to this new and pervasive challenge, this research sought to investigate how TAFE institutes are sustaining their skill bases. Firstly, it aimed to examine existing strategies that TAFE institutes have in place to maintain the currency of vocational competency of their teaching staff. Secondly, it investigated the strategies being used to transfer organisational knowledge and skills from those with extensive expertise and long-term experience teaching in TAFE institutes to those teachers with relatively limited experience.

The study was confined to the TAFE component of the VET sector, and was designed to take into account the complexity within this sector that is evident in the differences between TAFE institutes, and between state-based systems.

A mixture of qualitative and quantitative methods was used. Information was gathered from a literature review, a search of Australian and overseas websites, and an analysis of organisation documents (see appendix A of the support document available at <<http://www.ncver.edu.au>>). The study included in-depth interviews of 61 chief executive officers, human resource managers and senior educational managers in 16 TAFE institutes in seven states and territories (see appendices F and G of the support document). These were supplemented with a paper-based

questionnaire of 52 middle managers responsible for day-to-day management of teaching areas (see appendices H and I of the support document).

The findings of the research confirmed the complexity and diversity of the TAFE teaching workforce, both in the range of duties that were described as teaching, and the wide range of types of employment, and balances between full-time and other job configurations.

This complex research field made it difficult to generalise about issues concerning the skill base in TAFE. However, one finding that emerged was that TAFE managers recognised knowledge loss in many forms. They acknowledged that this ultimately affects efficiency and achievement, whether the loss is of teaching experience, qualifications, course development knowledge, VET know-how, organisational knowledge, or industry connections and good-will. Against this understanding of the possible negatives of loss, an understanding of its positives also emerged. There was appreciation of the opportunity to remove barriers to change and to shape training to match new demands.

Another finding that emerged from the research was the recognition of the difficulty of managing this loss—whether or not it was seen as a positive or a negative. Whatever approaches were used to manage loss, these could be negated by factors beyond the control of institutes, such as superannuation or health. And there was little consistency in approach to management of the skill base, either within institutes or between institutes.

Difficulties in managing the challenge and reality of knowledge loss lay partly in the variety of TAFE managers' interpretations of what constituted the skill base. These interpretations extended beyond the view of 'relevant vocational competency' as defined by the Australian Quality Training Framework (AQTF). The skill base was seen to include industry skills and links (and currency of these skills), and an understanding of current workplace culture. Teaching skills (and currency of these skills in a training package and workplace training environment), and technological confidence were also possible inclusions in the skill base. This range of views of what the skill base could be was accompanied by a range of options to sustain and develop it.

This research found that TAFE institutes used a range of recruitment and training options to maintain their skill bases. One simple option was the recruitment of teachers with recent industry experience. In the light of forecast difficulties in attracting skilled teaching staff, other options were seen to be needed, such as retaining mature workers beyond their traditional retirement age. Other options included training or re-training: sometimes within industry partnerships, sometimes professional development aided by performance management within institutes and sometimes informally. The research found that significant impediments to adopting these options were primarily the lack of resources—both time and money—as well as impediments from staff arising from lack of confidence, fear, resistance to change and lack of motivation.

An alternative to human resource and professional development options lay in retaining the knowledge—if not the worker—through knowledge transfer or sharing. There was a general recognition that policies were needed, and were indeed being developed to support various knowledge transfer practices. However, little was being done to define what critical knowledge needed to be retained or shared, and institute activities were reported as being often informal or simply promotional. Despite the recognition that knowledge transfer could produce gains in efficiency, service and professional quality, significant impediments were noted—overwhelmingly, lack of time and work overload.

The research found that TAFE institutes operated as educational businesses which do recognise the importance of a major business asset—their intellectual capital. This capital is fostered by national project initiatives within the sector, such as Reframing the Future, LearnScope and Flexible Learning Leaders. These projects do much to encourage teaching staff to actively participate in their own knowledge renewal. However, TAFE institutes demonstrate little interest—and use—of models of knowledge maintenance and knowledge transfer from

businesses outside the sector. Non-educational models are often unknown, or even seen to be irrelevant to educational businesses.

However, this study found considerable evidence from outside VET, predominantly from the world of business, of means used to sustain organisations' skill bases—all of which had some relevance and potential application to TAFE institutes in Australia. Insights came from professions with mandatory requirements to maintain continuing competency in their professional area. Competencies were maintained through specific training programs, professional reading, examination and re-examination, devoting certain hours per year to professional development and/or written evidence of continuing competency.

A selection of approaches to knowledge renewal was gathered from informants in the study, the literature, and a broad scan of business and knowledge transfer-related websites. They included mentoring schemes, yellow pages directories, storytelling, and systematic knowledge transfer systems. Examples of integrated knowledge transfer models that have some relevance to TAFE institutes included in this study are the Tennessee Valley Authority, United States; the National Health Service, United Kingdom; the Generic Learning and Teaching Centre, United Kingdom; Australia Post and Transport Canada.

In summary, this research found that TAFE managers do recognise that the imperatives in maintaining their institute skill bases in the immediate future lie in educational renewal, workforce management, and flexibility in a variety of contexts.

However, there is still a need for these managers to develop policies and practices which build a knowledge culture. These need to be based on sound research, cyclical processes and resourcing. They also need to draw on models of integrated, whole-of-organisation practices. And they need to find resources and incentives to support innovative workforce planning and professional development which will assist them to counter knowledge loss, and to sustain the organisational capacity of their institutes. Such measures, when supported by policy-makers and funding bodies, will enable TAFE institutes to more effectively meet the evolving training demands generated by the knowledge economy.

Research purpose

The purpose of this research was twofold. Firstly, it sought to examine the existing strategies that Australian technical and further education (TAFE) institutes have in place to maintain the technical currency of staff delivering vocational education and training (VET) programs. Secondly, it investigated the mechanisms being employed to transfer knowledge and skills from those with extensive expertise and long-term experience teaching in TAFE institutes to those teachers with relatively limited experience.

Research questions

The following research questions, drawn from these purposes, were examined in this study:

- ✧ What strategies are TAFE institutes implementing to ensure that the vocational competency of staff delivering training is current?
- ✧ What succession planning strategies are these TAFE institutes implementing to ensure the effective transfer of knowledge and skills?
- ✧ What do chief executive officers, senior educational managers and human resource managers within TAFE institutes see as the major facilitators and barriers to the maintenance of vocational competency and the effective transfer of knowledge and skills?
- ✧ What models from within these organisations or other educational sectors or business may be more broadly applicable within Australian vocational education and training?

Scope

The scope of this study was limited to 16 TAFE institutes and to the chief executives officers, human resource managers and a sample of senior and middle managers within those organisations.

That TAFE institutes were the focus of this research was in large part due to the fact that of all training providers engaged in vocational education and training, these organisations have the largest, most complex teaching workforces. They also have a sizeable percentage of teachers not only permanently employed, but also having served many years teaching in the sector. Additionally, TAFE institutes employ a significant number of sessional or casual teachers to provide the technical skill sets and flexibility required to meet the ever-changing demands of diverse client groups and national educational and training imperatives.

The intent of this research was to identify TAFE manager perceptions—to provide a snapshot of their focus, priorities and the range of strategies being used to ensure vocational competency and transfer of knowledge and skills—rather than how the strategies were being implemented. The research aimed to seek the reality ‘on the ground’, allowing the voices of the informants to show how many facets of a complicated situation can be simultaneously illuminated through researching two aspects of that situation.

Definitions

In consultation with the project reference group, minor clarifications of terminology used for the research were made.

The original research proposal sought to examine strategies which maintained the *technical currency* of TAFE institute teaching staff. Technical currency refers to the up-to-date industry-specific skills relevant to today's workplaces, and is an integral component of vocational competency.

Vocational competency is a term more closely linked to standards expected by the Australian Quality Training Framework (AQTF). This is a broad term adopted for this research from Standards 7.3a (ii) and 7.4 (ii) of the Australian Quality Training Framework (ANTA 2001) which emphasise the need for registered training organisations (RTOs) to ensure that practitioners are able to demonstrate vocational competencies at least at the level of those being assessed and delivered. These vocational competencies are the demonstrated skills and knowledge that enable someone to do a job in a workplace. They are industry based, and include familiarity with the latest industry developments. They include technical competency, technical currency and industry knowledge. Standard 7.4 (i) of the Australian Quality Training Framework further demands that training be delivered by a person who has all of the competencies in the Certificate IV from the Training Package for Assessment and Workplace Training. The National Centre for Vocational Education Research therefore requested that the research include teaching and learning as a focus in the study.

The original research proposal also sought to examine 'mechanisms' being employed to transfer 'corporate' knowledge and skills. In order to use concepts that were thought to be more familiar to those in the TAFE context, the research utilised the words 'strategies' instead of 'mechanisms' and 'organisational' knowledge and skills rather than 'corporate' knowledge and skills.

Organisational knowledge relates to organisational capabilities, management know-how and operational know-how (Haider 2003). This latter form of know-how is also known as working knowledge, which Chappell (2003) suggests is neither systematically in place in policies and procedures nor training programs, but is developed by individuals and teams within the working environment. It is high in use value, and is context specific.

In addition, the original research proposal aimed to examine the transfer of knowledge and skills from those with significant expertise and experience to *novices* entering the sector. Concentrating solely on the novices entering the sector was seen to be too limiting and the focus was redirected to those with relatively limited experience. The term 'novice' was therefore abandoned.

The term *skill base*, as used in the title of this report, is an encompassing term used to describe the collection of skills and knowledge possessed by the teaching staff of a TAFE institute that supports that institute's training capacity and credibility. These skills and knowledge are technical, education-based and organisational. The focus on *sustaining* the skill base of TAFE institutes in the study has as its basis not only the maintenance of current skills and knowledge, but also concepts of continuous improvement and ongoing capacity building.

In view of the diversity of the TAFE teaching workforce, the term *practitioner* has also been used to show that this research refers to teachers and trainers in TAFE institutes, regardless of their experience in industry, or in teaching, or the arrangements under which they were employed.

Further terminology used in the research instruments (the interview schedule and the questionnaire), which describes strategies used to facilitate knowledge transfer, appears in table 1.

Table 1: Knowledge transfer strategies

Strategy	Description
After action reviews	A discussion of a project or an activity that enables the individuals involved to determine what they have learned from the experience.
Communities of practice	Linking people together to develop and share knowledge around specific themes.
Knowledge audits	A systematic process to identify an organisation's knowledge needs, resources and flows, as a basis for understanding where and how better knowledge management can add value.
Mentoring	Using experienced people to provide support, guidance and sponsorship for those less experienced.
Exit interviews	A strategy for capturing the knowledge of people before they leave an organisation.
Knowledge centres	Like libraries, but with a broader sphere of activity which includes connecting people with each other as well as with print-based and electronic information.
Identifying and sharing best practice	Capturing best practices discovered in one part of the organisation (or externally) and sharing them for the benefit of all.
Knowledge harvesting	Capturing the knowledge of 'experts' and making it more broadly available.
Peer assists	A tool developed at BP-Amoco, and used to learn from the experiences of others <i>before</i> commencing an activity or project.
Storytelling	Sharing knowledge through telling stories in a meaningful and interesting way.
Yellow pages	A telephone or online resource that allows people to find colleagues with specific knowledge and expertise.
Social network analysis	Mapping relationships between people, groups and organisations.

Policy and practice issues

All TAFE institutes are operating in a competitive market. To maintain their competitive edge and meet the skill development demands of the broader Australian workforce, they must ensure that what training they deliver remains credible. To do this, they need to sustain the skills and knowledge of their teaching workforce. At the same time, senior managers of TAFE are faced with an ageing teaching workforce, many of whom are likely to retire in the near future, taking with them their considerable technical and teaching knowledge and skills—as well as the organisational knowledge that underpins these.

A rationale for this research is found in the issues that TAFE institutes must deal with in this context (refer to appendix A in the support document):

- ✧ Maintenance of vocational competencies is a vital concern in view of the twin demands of the Australian Quality Training Framework standards and the requirements of industry and individuals for learner-centred training when and where they need it.
- ✧ Retaining either the people or their knowledge is seen to be important in the context of an ageing workforce, and therefore effective succession planning and knowledge transfer has been identified as crucial for the renewal of the TAFE teaching workforce.
- ✧ TAFE institutes have attempted to address these issues to some degree by employing casual teaching staff who are actively involved in industry, knowing that they would bring with them up-to-date technical skills. However, while technically current, these staff may lack the competencies required under Australian Quality Training Framework for the delivery of vocational education and training programs.
- ✧ Further, organisational imperatives, work arrangements, lack of mobility and cost have often precluded full-time practitioners from accessing opportunities to gain new knowledge and experiences in their designated vocation. Practitioners have also consistently identified the lack of opportunities for enhancing their industry experience and technical skills.

The challenge for TAFE institutes in sustaining their skill base is to find ways to renew the skills and experience of its workforce, whether this is done by maintaining vocational competency or by retaining know-how. This is a considerable challenge in the light of the diverse and changing environment both inside and outside institutes.

Issues identified in the literature

Major issues for this research were identified in the literature consulted during this research project (see appendix A of the support document for further details). They provide a wider context for the research, while echoing aspects of the current policy and practice issues for TAFE institutes. They include:

The twin challenges of the knowledge economy and population ageing

A major issue identified is the changing nature of work—and workers—in the knowledge economy. Authors describe global change which is bringing about new employment patterns, new technology, and requires new working knowledge, capacities and attributes of its knowledge workers.

Also identified is the issue of population ageing, which is seen as having an increasingly significant impact on the workforce. While there is a view that competence and experience counts more than age, organisations are challenged by the complexity of this problem. They are posed with the urgent tasks of overcoming negative attitudes to ageing workforces, of retaining mature-aged employees, of providing learning opportunities for them, and of using them effectively to nurture less-experienced staff.

The vulnerability of TAFE institutes

In the context of these changes, some literature suggests that TAFE institutes are among those organisations that require a highly adaptable, innovative, skilled workforce. Yet, like the broader workforce, they have the potential for an erosion of skills at a time when they need these assets most. Vital organisational memory and tacit, unrecorded knowledge is at particular risk of departing if mature workers choose to retire.

TAFE institutes are currently attempting to meet the challenges of change from a position of considerable vulnerability. Their industry is one of the most exposed to the ‘retirement bubble’. TAFE institutes also have difficulty attracting and retaining new teachers, and are increasingly dependent upon casual teachers for industry currency and credibility. Professionally, TAFE teachers have to deal with an identity transformed from that of the traditional teacher. Now they are required to be more learner-centred, work-centred and focused on the personal attributes and generic skills of learners. Simultaneously, they have had to develop the capacity to meet the training expectations of individual learners, employers, industries, colleagues, organisations, community and government. New technologies and options for delivery have markedly increased the complexity of the work of TAFE teachers.

Literature on change and the vulnerable position of TAFE institutes within it, suggests a need for further research, such as this study, which could throw some light on a unique and complex situation.

The challenge of sustaining the TAFE skill base

Some literature recognises that sustaining the TAFE skill base has become a matter of paramount importance for senior management and practitioners in TAFE institutes, and outlines major means to do this. These means include the retention of mature workers beyond the traditional

point of retirement, and strategically targeted professional development that leads to enhanced professional capability—rather than mere conformance with requirements.

However, there is also considerable evidence to indicate that training providers and practitioners are struggling to meet the audit obligations required by the Australian Quality Training Framework. This struggle lies partially in the complexity of two tasks: firstly, maintaining currency of vocational competency and contacts with industry networks and cultures; secondly, developing a new VET teaching methodology which casts teachers as learning experts as well as technical experts.

Further extensive literature deals with strategies to meet these challenges. Such strategies include: knowledge transfer to support the ‘purposeful protection’ of critical knowledge, and knowledge sharing to ensure more efficient learning for new or re-training workers and for safeguarding organisations from excessive knowledge loss.

The many facets of the challenge to sustain the TAFE skill base as outlined in literature indicate a need for continuing research to explore what is happening on the ground.

Methodology

The design of the study

This study was designed to examine the strategies being used in Australian public registered training organisations to maintain the vocational competency of teachers, and to facilitate the transfer of explicit and tacit organisational knowledge from highly experienced practitioners to those with less experience.

The complexity of TAFE organisations, the differences in approach from state-based system to state-based system, and the potential for quite disparate processes and perspectives dictated the use of quantitative and qualitative research methods in the research. Information was gathered through a review of literature, a search of Australian and overseas websites, an analysis of organisational documents, as well as through in-depth semi-structured interviews and a paper-based questionnaire.

To further shape the focus and content of the research, a project reference group with expertise and interest in the issues of maintenance of vocational competency, knowledge management and knowledge transfer was also used.

Details of the sample

Sixteen public registered training organisations participated in the study: four from New South Wales, three each from Queensland and Western Australia, two each from South Australia and Victoria, and one each from Tasmania and the Australian Capital Territory. Nine of the institutes were based in metropolitan locations and seven were regional.

Chief executive officers (called managing directors in some states), human resource managers, senior managers responsible for educational delivery, and middle managers responsible for the day-to-day management of teaching areas were informants to the study. In a number of organisations, chief executive officers nominated someone other than themselves to be interviewed, generally because that person was tasked with responsibilities in ongoing professional development, succession planning or knowledge management across the entire institute.

Senior educational managers and middle managers who participated in the research, either in interview or in the questionnaire, identified themselves as being responsible for delivery across a broad range of industries and Australian Qualification Framework levels. They were drawn from new and emerging areas of training such as forensic, multimedia and sport as well as the more established or traditional areas of TAFE delivery like metals, engineering, hospitality and horticulture. The educational managers were responsible for people working closely with training packages in workplace environments, and teachers engaged in the delivery of literacy and numeracy and other adult basic education programs.

A total of 61 interviews were conducted with institute senior managers, while 52 responses were received from middle managers engaged in educational delivery. The breakdown of participants by management category is set out in table 2.

Table 2: Participants by management category

Position	Interviews	Questionnaires
Chief executive officers	10	-
Nominees of chief executive officers	6	-
Human resource managers	16	-
Senior educational managers – delivery	29	-
Middle educational managers – delivery	-	52
Total	61	52

Supporting documentation

Formal letters of request were sent to the chief executive officer of each participating institute, accompanied by an information sheet and an organisational consent form. These documents are included as appendices B, C and D of the support document. The organisational consent forms specifically asked the chief executive officers not only to indicate their permission for their institutes' involvement, but also, in line with emerging concerns about privacy, to indicate whether it was their preference that their organisations be named in the study.

Formal application and consent was sought for the New South Wales institutes to participate as required by *Guidelines for approving applications from external agencies to conduct research in TAFE NSW* (Department of Education and Training 2001).

Human resource managers and senior educational managers were provided with a copy of the project information sheet and a personal consent form (appendix E of the support document). Information sheets were also emailed to educational middle managers.

For privacy reasons, neither the names of organisations nor informants are provided within this report.

Data collection process

Semi-structured interviews were conducted with institute senior managers, while a questionnaire was disseminated to a sample of educational middle managers.

Interview protocols were developed to ensure that information was gathered in a systematic and consistent way, given material was being collected by a range of researchers using either telephone or face-to-face interview techniques. Separate interview schedules were developed for chief executive officers/human resource managers and senior educational managers. These focused on the key research questions and covered the profile of the institute workforce, the transfer or sharing of knowledge within the organisation, and the maintenance of vocational competency of teachers. Copies of the interview schedules are included as appendices F and G of the support document.

Interviews were semi-structured to facilitate the emergence of individual experiences and perspectives while maintaining a focus on the issues. They were conducted face-to-face or by telephone. Where available, relevant institute documentation identified by informants was collected.

Questionnaires and information sheets were emailed to educational middle managers for return by facsimile. In line with the interviews with senior managers, a mix of forced-response and open questions were used, focusing on the same aspects but at a teaching department or teaching team level. A copy of the questionnaire is included as appendix H of the support document.

An extensive search of literature and websites was conducted. This search included both Australian and overseas material. The objectives were to examine research into continuing competency, knowledge transfer and knowledge retention, as well as issues relating to the VET teaching workforce. This literature review is included as appendix A of the support document. At the same time, organisations that had implemented strategies to sustain the skill base of their teaching workforces were also identified. Descriptions of working models, drawn from a range of business and educational environments, were developed. These are included as appendices J and K of the support document.

Data analysis

The transcribed records of interviews were analysed by hand using a coding and categorisation strategy. This approach allowed the systematic identification of major themes, commonalities and variances across institutes and informant groupings, together with variations and inter-relationships within organisations and management clusters.

Closed questions within the questionnaires were analysed using Microsoft Excel to calculate simple descriptive data. Open-ended questions within the questionnaire were analysed in a similar manner to the interviews, using a series of broad categories and codes to establish key themes.

A cross-analysis of the information from both the interviews and questionnaires was then undertaken to clarify themes, internal consistencies and variations within and across manager levels. The goal of this exercise was to identify any significant differences between senior institute managers and middle managers working at an operational level.

Potential models of knowledge transfer were assessed on the basis of their applicability or adaptability to a VET environment.

Limitations of the study

As with many studies in the VET sector, it was relatively easy to gain access to the participating TAFE institutes and their chief executive officers and senior managers. However, it proved to be more difficult to gain access to educational middle managers (those responsible for managing teachers in the day-to-day delivery of VET programs). The intention was to obtain questionnaire responses from 128 middle managers. Instead only 52 were received. This low response was largely an outcome of the research being conducted from November through to March when teachers and their managers are engaged in assessment, enrolments or are on leave.

Furthermore, this study was undertaken at a time when significant structural changes were occurring within TAFE systems in two states. The uncertainty attached to this activity meant some organisations felt less able to actively encourage their staff to participate in the study.

Limiting the study to 16 large Australian TAFE institutes meant that the findings can only be indicative of the broader experience of TAFE across Australia.

Workforce renewal

Difficulty in diversity

Cully et al. (forthcoming) identified the difficulty of collecting consistent information on the TAFE teaching workforce. They also identified some of its diversity. This study confirms these findings. When chief executive officers and human resource managers were asked to describe the teaching staff employed in their institutions, their answers reflected the growing complexity of what it means to be a teacher. Some chief executive officers described institutes where full-time staff outnumbered part-time and casuals, but a greater number described institutes where the reverse was the case. Teachers were variously described as delivery and non-delivery. Tutors, markers, technical advisers, assistants and workplace trainers were also included as teaching staff.

Confirmation of this diversity was also provided by the 52 surveyed middle managers, who were responsible for the day-to-day delivery of TAFE programs and who were able to give a 'hands-on' description of the staff they managed. For example, these middle managers provided clear evidence of the quite differing mixes between permanent/temporary teaching staff that existed both within and across the participating institutes. Six middle managers indicated that more than 90% of their teaching staff were permanently employed, while a further six managers indicated that casual teachers formed 90% of their delivery area workforce. Other responses described permanent-casual teacher mixes that fell anywhere between these two extremes. A table showing the percentage of permanent teachers within teaching areas identified by middle managers is included in table 7, appendix I of the support document.

The differing levels of teaching experience provide another demonstration of the diversity of the teaching workforce. In describing the teaching experience of their staff, the majority of middle managers (60%) indicated that they had more than a third of teachers with over 15 years experience teaching in vocational education and training. In some cases (12% of the total) these experienced teachers made up the bulk of their teaching staff (more than 80%). Many indicated that they had a mix of teachers with less than five years and teachers with more than 15 years experience, but with very few in the middle age range. Interestingly, only a small number of middle managers described having a reasonable proportion of their teachers falling into the 6-14 years teaching experience range.

If there is difficulty in describing such complexity and diversity in the teaching workforce, there must be an associated difficulty in generalising about the skill base in TAFE institutes—or even in safely making assumptions about the teaching workforce and its skills. For example, one early assumption of this study was that, given that the Australian workforce was ageing and retiring earlier, sustaining the skill base in TAFE institutes was an issue of older workers moving out, and younger workers moving in. This was challenged during interviews. Sustaining the skill base was more generally perceived as an issue of experience and inexperience—not solely one of mature age and youth.

On the edge

The full range of informants showed that they had taken into account the issue of maintaining their institutes' skill base. However, the two focuses of the research—maintaining the currency of vocational competency of practitioners and transferring knowledge and skills—were not generally recognised as important in their own right. Informants saw these practices as being driven by other imperatives, in particular Australian Quality Training Framework expectations and the day-to-day work of running TAFE 'businesses' to meet the varying demands of their clients. Industry concerns about currency and credibility were also seen to be an influential driver.

Informants often linked vocational competency and knowledge transfer with workforce planning: succession and recruitment; strategic planning including business planning and budgeting; and the team planning associated with professional development and performance management plans. Much of this planning was enshrined in audit and regular reporting processes.

Chief executive officers, human resource managers and educational managers were questioned on two particular planning activities relevant to sustaining the skill base: monitoring of the age of the teaching workforce, and scenario planning for future directions for the organisation and its workforce. The majority of informants described the planning in these two areas as being limited and informal—or as simply providing ideas for the immediate future that were still under discussion.

Forward thinking based on monitoring the age of the teaching workforce varied. Informants described workforce monitoring as it related to planning for new or different skill sets, professional development or retirement seminars, performance management, and as part of measures to address absenteeism and health issues. The issue of age and workforce monitoring is just an emerging one for a number of chief executive officers and senior educational managers. Some comments were:

We do monitor it [age], but we haven't actively started to do anything about what we are finding.

In their business plans some teams have this year—and every team will have next year—an age profile of all their team members, and will be asked to put in projections of when they think the changes are going to happen.

Likewise, when asked about the use of scenario planning in their institutes, the term was broadly interpreted to be part of regular workforce, strategic and team planning rather than scenario planning activities in their own right. Variations in scenario planning reported ranged from a major review of support services to single issue activities such as identifying inadequacies in structures and roles, or responding to curriculum redirections. Some scenario planning was formal, institute-wide, facilitated by a consultant and annually reviewed. A number of institutes did course profiling to determine where teaching staff would be needed in the future. Two-thirds of middle manager respondents indicated that they had engaged in some form of planning to examine the future needs of their teaching area and teaching staff.

In short, many TAFE institutes are still defining the issues of maintaining the skill base as workforce planning, ageing and workforce renewal—and many are only on the edge of dealing with them.

Issues for TAFE institutes in maintaining the skill base

Negatives of ageing and loss

The research found that a major issue in maintaining the skill base in TAFE institutes was the ageing of practitioners. Loss was a constantly repeated word during this study and invariably was linked to ageing. Informants expressed a broad concern at the impending loss of a highly experienced section of the teaching workforce, and at not having people with the skills and knowledge to replace them as heads of departments, managers, senior teachers, expert lecturers and mentors. This echoed the descriptions in the literature of looming 'knowledge loss', 'knowledge collapse', and 'knowledge discontinuity' (Access Economics 2001; Casher & Lesser 2003; Field 2003).

This loss of experience was projected to take many forms. A major loss identified was that of teaching qualifications, teaching experience, and course development knowledge. The loss was anticipated with foreboding where there were no replacement teachers coming up in specialisations, no beginning teacher program to start this replacement flow, no replacements for experienced middle managers and high costs of training new full-time teachers. For example, comments such as, 'As a worst case scenario, in five years time 80% of head teachers will have reached retirement age' and, 'Negatives? I think we're going to lose some outstanding lecturers and their expertise in their delivery area' reflected the views of many chief executive officers. In the same vein, a senior educational manager suggested, 'I haven't got young people coming through with the same skills as the older people ... and it could take me five years to develop the skills in someone'.

More than half of the middle manager respondents noted that ageing was going to be a problem in their delivery area in the next three to five years, particularly because many of them had very high ratios of long-serving teachers and very few younger, less experienced people to replace them. Others who considered their current teaching workforce was well balanced, also acknowledged that in the not too distant future that situation was likely to change. One respondent suggested:

I expect to lose three very experienced teachers in the next three years. However, six teachers who between them deliver 50% of the total program of the section will be either retired or over 58 years old in five years time.

With many teaching staff due to leave, middle managers generally considered the greatest losses were likely to be in high level teaching skills and educational knowledge, 'VET know-how' and the ability to deliver in often complex and difficult teaching environments. Providing the essential professional development to get new teachers 'up-to-speed', finding skilled replacements and developing 'team players' were noted as some of the key issues in engaging new teachers to take the place of those leaving the teaching workforce.

Other major losses (projected by chief executive officers, senior educational managers and middle managers) were those of organisational knowledge, industry connections and goodwill, especially where industry partnerships were critical to the successful delivery of training. Middle managers also emphasised that highly experienced teachers with corporate and industry knowledge could not be replaced easily, quickly or cheaply.

Replacing experienced teachers with good teaching skills and knowledge of the VET sector with new staff from industry requires significant input of time and mentoring. This adds to the workload for head teachers, who themselves will need to be replaced in the near future.

Positives of ageing and loss

Countering these views, and similar predominant views in the literature, many informants saw the losses caused by the departure of ageing and/or experienced teaching staff as a positive. One positive gain to be made from the departure of long-serving teachers was seen to be the removal of some barriers to change. Particular barriers informants recognised were attitudinal: negativity about new ways of working and loss of motivation in day-to-day teaching. These attitudinal barriers were sometimes posed by teachers in traditional trades areas with low growth in employment and a low uptake of work-based training and new technology.

The loss of a significant percentage of experienced teachers also provided an opportunity to obtain a teaching workforce with the current skill sets demanded by the market. It could provide movement in a permanent teaching workforce that had skill sets that no longer matched those being demanded by their industry sector. In particular, it was an opportunity to bring in teachers in new and emerging disciplines and industry cultures that were now demanded, and an opportunity to increase industry partnerships.

Movement in the teaching workforce provided a further opportunity to inject fresh ideas into TAFE institutes. New approaches to learner needs could supply the relevance demanded by young students. This could also enhance the flexibility demanded by individual enterprises and industry more generally, for example in moving to workplace delivery.

In terms of the positive, it certainly opens up opportunities for our youth to actually come into the system with fresh ideas and fresh perspectives on learner needs and learner approaches.

In workforce management terms, it was an opportunity to vary the proportions of casual and permanent staff, particularly where there was a state initiative or other workplace pressure to do so. A number of states have established proactive strategies to employ certain ratios of permanent and casual staff—a staff profile of 70% permanent and 30% casual positions for example. Further, the movement out of staff has opened up access to permanent positions for less experienced and casual teachers, newer teachers, and younger people seeking to take up teaching positions in TAFE institutes.

Managing ageing and skill loss

Whether loss was perceived as a negative or a positive, the difficulty of managing it was recognised. For example, informants reported grappling with the uncertainty of retirement timing. The difficulty of attracting and retaining quality teaching staff was a major issue as well, particularly when wages and conditions in some industries were seen to be markedly better than those in TAFE.

One noteworthy concern emerged: that assumptions should not be made in management of ageing and the TAFE teaching workforce. For example, one senior manager sounded a note of caution for institutes managing workforce loss: that whatever planning might be done with regard to the workforce, it could be negated by factors such as superannuation or health. If superannuation growth was reasonable, people would probably leave. If growth was minimal or negative, teachers might stay on when it was preferable for them to leave. Further, health and welfare issues tended to increase with older workers and could impede the effectiveness of any workforce planning that was done.

Industry perspectives also provided a challenge to assumptions about management of ageing. For instance, one senior educational manager noted that information technology tended to attract people with high commitment to the industry and with the ability to deal with continuous change, because that is the very nature of the business. Hence this response on the consequences

of ageing in the teaching workforce, 'I don't believe it is an issue. We have staff from age 19 to 60. Those that are in the top age range are willing to keep up to date, or they wouldn't be in the industry'. This attitude was further confirmed by a middle manager who commented, 'I do not consider "ageing" to be a definitive term that has any relevance or relationship to enthusiasm and ability. It is an overrated problem'.

A notable feature of this research was that it showed the variety of strategies being used to renew the workforce. Senior managers and middle managers approached the challenge in a variety of ways.

Senior management

Across the 16 institutes there was little consistency. In three institutes, specific units had been created to handle strategies to deal with overcoming loss of teaching staff—and skills. These, however, were the exception. While the greater percentage of informants overwhelmingly reported implementing some strategies, many strategies were insubstantial, and chief executive officers and senior managers were planning for future rather than current implementation.

Those strategies that were implemented matched the management options offered in the literature: retaining mature workers, recruiting new workers and linking the two strategies by knowledge transfer. The study confirmed that TAFE institutes were using variants of these strategies. Retention of older teaching staff was seen as a definite option if re-training were provided to enable them to stay in TAFE employment. Professional development strategies such as re-skilling, multi-skilling, and return to industry for both remaining and replacement teaching staff, were on the agenda for many institutes. Mentoring and coaching less-experienced teachers and using the recent industry experience of casuals to keep full-timers current were minor but recurrent ideas. Some reported taking what they saw as a risky strategy of up-skilling casual teachers as replacements when they did not necessarily have assurance of their commitment to the institute, or when they might be 'poached' by other organisations.

Providing alternative employment options was seen as a further means of encouraging teaching staff to stay in TAFE employment. Human resource managers reported that greater flexibility in employment arrangements and conditions was slowly being implemented. For example, one informant described a situation where alternative arrangements were negotiated to achieve a positive outcome, 'I have offered him .5 for two years with which he is happy. He gets to ease into retirement and I get to reduce my permanent staff by .5. Everybody is happy'.

However, tensions were evident in senior management views on recruitment of new teachers versus retention of highly experienced, long-serving members of teaching staff. In a number of cases, informants reflected that it was equally or more important to attract new people to teaching than to keep older teachers for a few more years. They noted the importance of redesigning job roles and duty statements to ensure that people with the appropriate attributes as well as industry experience were recruited.

Middle management

Tensions also existed for middle managers working at the point of training delivery, mainly between action and inaction. Just over half responding to the questionnaire indicated that they had no strategies in place within their delivery areas to manage the consequences of workforce ageing. This was despite a relatively high number of them having identified it as a problem or a potential problem in the near future.

However, the strategies they did identify as being in use focussed more on new teachers than experienced ones. The strategies they identified were:

- ✧ active recruitment of younger teachers, including the employment of younger part-time and casual staff (41%)
- ✧ professional development, focusing on change management (31%)
- ✧ transition of casual teachers to permanent teaching positions (28%)

Among other strategies described less frequently by the middle managers were succession planning, mentoring of new teachers and—as also described by senior education managers—the retention of older teachers past their possible retirement date. Another approach noted by a number of the respondents was the adoption of transition processes in which highly skilled teachers moved to less critical areas allowing newer teachers opportunities to build their skills.

Summing up many of the views of middle managers, one head teacher commented:

One goal has to be actively engaging younger sessional staff with a view of being able to promote them as positions become vacant and to upskill ‘younger’ staff with PD opportunities designed to help them gain greater understanding of management and leadership tasks.

Maintaining vocational competency

This study showed an understanding by TAFE managers that the renewal of their teaching workforce—and the viability of TAFE institutes—depends on maintaining the vocational competency of its teachers. To do this most managers favour strategies that ensure industry skills and knowledge are kept up to date and relevant to current industry practice. Others' approaches include organisational mechanisms such as performance management linked to targeted professional development for existing teachers, and recruitment of new staff with recent relevant industry experience. But the managers recognised that the task is not easy. It includes the challenge of overcoming impediments such as inadequate resourcing, negative teacher attitudes to formal and ongoing professional development, a lack of employer interest in supporting developmental activities such as return to industry, together with a range of other practical difficulties.

Further, it was evident from the study that these managers had various interpretations of what vocational competency it is that they are maintaining.

Vocational competency is referred to in Standard 7.3a (ii) and 7.4 (ii) of the Australian Quality Training Framework. This standard asks registered training organisations to ensure that practitioners are able to demonstrate 'relevant vocational competencies' at least at the level of those being delivered and assessed. However, it does not spell out what these vocational competencies are. Rather, it is a recognition that the technical skills of practitioners delivering qualifications in training packages are crucial to the quality of vocational education and training, and that vocational competency ensures credibility with the market and key stakeholders—both industry and learners.

Views and meanings

This study sought to explore and clarify the understanding within these institutes of 'relevant vocational competencies' as referred to in Standard 7.

When asked about relevant vocational competencies at interview, two-thirds of informants primarily focused on industry skills. They described the term as meaning an ability to perform the tasks, practise the technical skills or demonstrate their own competency in the disciplines and industry areas at the level being taught or higher.

Furthermore, currency of vocational skills and knowledge was important to this group, particularly as achieved through up-to-date links, relationships and experience with the relevant industry. An understanding of the current workplace culture was seen as a critical component of vocational competency. In fact, many chief executive officers regarded current industry knowledge and links with industry as equally or more crucial to a teacher's competency than experience or formal training.

In keeping with these views, just over half of the middle managers surveyed affirmed that the term meant both industry competencies and qualifications at least to the level taught, as well as

the Certificate IV in Assessment and Workplace Training. They also placed considerable emphasis on recent and relevant experience in industry and a thorough understanding of current industry issues, innovations and culture. Other aspects of recency and relevancy described were: staying on top of evolving professional knowledge and skills, keeping abreast of change and, more generally, ‘maintaining a strong interest and enthusiasm for a professional field’.

A broadly consistent outline thus emerged of what ‘relevant vocational competencies’ meant in these TAFE institutes: a teacher must be able to demonstrate the competencies being taught (at least at the level being taught) in their most current industry form. They must also have a current knowledge of, and links with, the relevant industry, including an understanding of workplace culture.

However, half of human resource managers expanded this view of ‘relevant vocational competencies’ to include teaching skills and teaching qualifications. Some commented that it should include experience of new teaching approaches—such as work-based learning and assessment, problem-based learning and flexible delivery to support learning within the training package environment—as well as the ability to impart knowledge. An emphasis on teaching was also strongly evident in responses provided by many of the middle managers. They indicated that vocational competency included the skills and knowledge essential for effective delivery: an understanding of teaching and learning principles and practice, classroom and small group management, skills in innovative delivery strategies and ‘technological confidence’.

Other elements mentioned as relevant to vocational competency—but to a lesser extent—were current computing skills, employability skills and behavioural attitudes.

These results show that as a general rule informants took a broader view of ‘relevant vocational competency’ than that defined by Australian Quality Training Framework, and further, that they expanded the definition of ‘working knowledge’ to show more clearly what knowledge they considered is under threat of loss in the TAFE context.

Strategies for skills maintenance

Education and training is seen in extensive literature as a crucial mechanism for maintaining worker knowledge and skills against the threats of workforce ageing (see Casher & Lesser 2003 and Access Economics 2001, for example). The research confirmed this for the TAFE teaching workforce. Across the 16 institutes included in the study, a number of strategies which provide a broad interpretation of what education and training can mean have either been put in place, or have been recognised as likely to contribute to ensuring that the requirements of Standard 7 of the Australian Quality Training Framework are met.

Industry connections

Those strategies most favoured for maintaining and extending vocational competency put teachers in close contact with industry. Approaches included formal partnerships with industry, including joint ventures with industry and working with industry in workplace delivery. One informant commented that teachers’ skills were maintained because 35% of the organisation’s programs were delivered in the workplace. It was consistently suggested by senior managers that industry contacts and networking were informal strategies that helped maintain skills. Industry-related activities such as visits to areas of good practice, professional association membership, and taking part in committees or conferences in industry areas, were examples of industry contacts. One informant said:

... I think the closer engagement with the workplace is the best way—having people working in the workplace and visiting the workplace and really connected to the workplace. It’s better than industry release—the currency of being there and being part of it, even

though they're not doing it. They're more cognisant of what's required in the standards and skills in the workplace.

One type of industry contact was frequently mentioned—return to industry (where teaching practitioners spend some time working in industry in their field of teaching specialisation). A number of approaches to return to industry were identified, ranging from the mandated to the self-initiated, and from brief to extended periods of time. Variants of return to industry were industry work or project placements to re-skill teaching staff.

Another type of industry contact less frequently mentioned was right to private practice. This involved teaching staff maintaining industry employment or conducting a small business as well as TAFE employment. There was, however, a good deal of inconsistency in the way this strategy was implemented across the institutes in the study. In some states, right to private practice was prohibited, while in others institutes had different strategies for managing the activity. For example, while some institutes insisted that their teaching staff apply annually for approval to practise privately, one informant said of right to private practice:

Certainly there are plenty of examples of it. I mean, we couldn't stop them if we wanted to. A few years ago they had to get permission but that's not the case any more. I think it's healthy that they do.

Another suggested:

Some people would have their own businesses—a lot of our sessional staff of course have jobs. If full-time, you have to negotiate to have another job. It is all underground here. It happens, but it is not clearly documented.

The study did uncover differences in opinions on preferred strategies. Chief executive officers and human resource managers considered a range of 'incidental' strategies relating to industry as good value. For example, casual staff updating permanent staff, closer engagement with the workplace through delivery and assessment of training packages, action learning and right to private practice. Senior educational managers favoured the more formal strategies such as return to industry, industry partnerships and work-based training. As one manager said:

The return to industry and partnership model is the best value for money because what we do there is we extend the business, we provide a really fantastic service and our member of staff gets education as well.

Middle managers provided a contrasting view of how teachers maintained their vocational competency. From a listing of possible strategies drawn from the literature (Moy 2001) middle managers noted teacher networks, workshops/forums, involvement with professional bodies and enrolment in TAFE courses or modules were more often employed than any other strategies. Less than half were using return to industry as a means to upgrade technical skills and only a few more were utilising industry partnerships. Further details of middle manager responses on strategies are included in table 9, appendix I of the support document.

Performance management and professional development

The research identified performance management as an organisational strategy to maintain vocational competency. This typically involved staff profiling, the conduct of skills audits, regular reviews and the maintenance of databases. Having identified skill gaps, this profiling is linked to guided professional development or professional development planning, some of it mandated and logged, some of it linked to business plans and organisational directions. The link between quality assurance, vocational competency and professional development was a consistent theme through the responses of the majority of senior management of the institutes.

Targeted professional development was used to maintain skills. This was done by involving industry experts and a range of informal activities, as well as more formal training. Induction,

information technology training, and planned skills development were also strongly favoured, particularly by human resource managers. The Certificate IV in Assessment and Workplace Training was identified by some informants as being compulsory, even for casuals, with some institutes releasing teachers from their normal duties to upgrade their skills. Other formal training activities, whether higher education or training package qualifications, were also regularly mentioned.

Recruitment

Recruitment was also seen as a means to support skills maintenance. Some informants spoke of recruitment practices in which vocational competencies were used as job requirements, or to provide generic job descriptions. Others spoke of how recruitment practices helped in the gathering of skills profile data. More generally, recruitment of casuals and part-time staff with current industry skills, and regular review of part-time eligibility lists, helped to ensure monitoring and maintenance of appropriate skill mixes.

Impediments to maintaining vocational competency

All participants in the study identified three broad groups of impediments: resources, disposition and practicalities.

Resource impediments were lack of both time and money. These two were often inextricably linked with the issues of teaching workload, pace of change, imposition of audit requirements that encroach on people's time, maintenance of records relating to User Choice, and teacher release and replacement for professional development. Middle managers, in particular, reported competing priorities as a major barrier to the planning and implementation of effective developmental activities for teachers. The following comment reflects the views of a vast majority of informants:

The time and money required to access job rotation/secondment or return to industry so that it is worthwhile, that is, where skills and knowledge can be truly updated, is just too much for most teachers, teaching departments and the institute—a week or so is simply a waste of resources.

The dispositional impediments among TAFE employees were seen to be lack of confidence, fear of returning to an industry that may not be familiar to them anymore, resistance to change, and lack of motivation as teaching staff near the end of their careers. Middle managers, in particular, reported 'closed minds' and 'out of date cultures' as being a significant issue in some teaching areas. These, they noted, were often associated with either a genuine lack of confidence in going back to industry or a failure to recognise their own skill deficits. Thus, comments such as, 'This is what I have been doing for 20 years. I know what I am doing. I don't really have anything to learn' were not uncommon in some teaching departments of these institutes. Davey (2003) extends this finding by proposing a further range of negative employer attitudes to ageing workers which can hinder the maintenance of vocational competency. Age discrimination, stereotyping of older workers, undervaluing of human capital and of a mixed-aged workforce, plus an unwillingness to risk costs of re-training older workers form a cluster of considerable impediments.

These negative employee and employer attitudes underpin many of the practical impediments in industry, organisation and environment that were identified by participants in this study. Industry impediments included the difficulty of accessing suitable workplaces that were willing to have teachers learn to use new technology and expensive machinery, and of accessing workplaces which were up to industry standard, or that were engaged in training using training packages. In regional areas, there was an additional barrier caused by the lack of businesses across the various

industries. These impediments could be exacerbated by a lack of networks with industry. Organisational impediments included: poor management and educational leadership, devaluing of the importance of technical skills, and a lack of incentives, regulation or policy within institutes. Environmental impediments ranged from difficulty accessing training due to geographical isolation, to the broader difficulties posed by an environment of rapid, frequent technological change, and a changing—and ageing—demographic.

These broad groupings of impediments also had the potential to be groupings of means to facilitate the maintenance of vocational competency.

Insights from non-VET settings: Maintenance of vocational competencies

All managers in the study were asked a key question: whether they were aware of strategies that might be useful for maintaining vocational competency that were already used by other educational sectors, the professions or the business sector.

Of chief executive officers and human resource managers, less than half (38%) said that they knew of such strategies. Of senior educational managers, even fewer (31%) were able to describe useful strategies from elsewhere. Many of the examples they gave were general rather than specific strategies.

A number of informants noted that updating of vocational competencies was mandated in other professions such as nursing, accountancy and policing. For example:

Queensland Police have a very structured approach to their professional development of staff. Every year, you have to do certain competencies, a certain number of hours and be signed off to say that you attended that. That is actually structured into their work. In addition to that their competency acquisition program [is] aligned with their pay point progression system.

In the literature surveyed during this study there is considerable evidence from outside vocational education and training, predominantly from the world of business, of means used to sustain organisations' skill bases. Some of the approaches and models from literature can be found in the section on 'The concept of continuing competency' in the literature review in appendix A of the support document. The clearest insights came from the areas where professional associations have mandatory requirements for members to undertake professional development to maintain continuing competency in their discipline. This is generally through specific training programs, professional reading, examination and re-examination and the like. In some instances professional development is mandated in the form of hours per year; in others, members are required to provide evidence in written form of their continuing competency.

What is going on in many institutes reflects this approach. The difference is that it is not professional associations mandating requirements for continuing competency, but the organisations themselves, usually through industrial agreements. Many TAFE teachers are also members of professional associations and do adhere to the requirements of those associations.

Retaining working knowledge

This study explored how TAFE institutes were facing two urgent and imminent tasks in retaining working knowledge: fully identifying knowledge they saw as critical to their continuing effective functioning, and implementing policies or processes to share such knowledge between experienced and less experienced teaching staff.

TAFE institutes' activities to maintain the vocational competency of their teaching staff may not necessarily maintain knowledge in a broader sense—or be enough to preserve the credibility of their institutes. This research showed that some institutes considered that other activities may be needed in order to share experience and knowledge before it is lost—that is, to retain knowledge as well as to maintain it.

While it was generally acknowledged that retention of critical knowledge is an issue requiring attention, the findings suggest that only a small proportion of institutes have either undertaken a formal process of identifying this critical knowledge or have put formal policies in place to ensure that it is not lost. However, some informal activities and processes are being undertaken.

Likewise, although informants gave opinions on what knowledge they believed to be critical, they showed less than whole-hearted support for working in their organisations to identify such critical knowledge.

Institutes preferred the practical rather than policy approach to knowledge transfer, and promoted and supported formal and informal strategies to benefit efficiency and learning. Despite the recognised benefits of knowledge transfer, time and workload were overwhelmingly seen as a major barrier.

Identifying critical knowledge

In this study, informants were asked to categorise under broad headings the knowledge they regarded as critical and that should not be lost to the institute through staff attrition. The combination of categories they described were similar to the definition of knowledge used by Davenport and Prusak (1998, p.5): 'a fluid mix of framed experience, values, contextual information, and expert insight'. Two primary areas of concern emerged across all informant groups: industry knowledge and organisational knowledge. As was already noted in regard to maintaining vocational competency, chief executive officers emphasised industry-associated knowledge, including technical skills. Next in importance was organisational knowledge, including knowledge of business and administrative functions and management skills. Senior educational managers agreed with these priorities. However, human resource managers reversed this, defining management and organisational knowledge as critical, followed by industry or technical knowledge.

Both chief executive officers and human resource managers recognised the knowledge related to teaching and learning as critical. This knowledge was defined broadly as including curriculum and information technology skills, teaching and learning skills and product development. However,

amongst senior educational managers, teaching knowledge was recognised within a group of minor categories of critical knowledge that also included curriculum, training package implementation, historical knowledge, legislative and regulatory requirements, and community links.

When asked whether their organisation or delivery area had done any work to identify what knowledge was critical, the answer depended on who was being asked. Relatively few chief executive officers and human resource managers (34%) claimed that their organisations identified critical knowledge, and half of these admitted it was done informally or incompletely. A further 25% were vague or did not know. As one chief executive officer said, 'knowledge is not necessarily seen as a strategic resource in an organisation. Therefore we have not come to grips with how we should manage it'. A range of informants' opinions included statements such as: 'history—happy to lose it', 'knowledge is not a TAFE language', 'everyone is replaceable' and 'formal training is preferable to knowledge transfer'.

In contrast, those who were more directly engaged in delivery—the senior educational managers and middle managers—were more confident about the identification of critical knowledge. More than half (55%) of both groups identified some work that had been done in their delivery area to identify this knowledge.

There was general acknowledgement that sharing of critical knowledge is an issue, even when the first step—identifying critical knowledge—has not been taken.

Policies for knowledge transfer

Just as a large number of informants could not report on work being done in their organisations to define critical knowledge, the findings also indicated that very few institutes have formal organisational policies in place that directly address transfer of knowledge. Only 17% of senior educational managers and middle managers claimed to have a policy. Amongst the chief executive officers and human resource managers interviewed, the proportion was even lower at 6%.

However, some of those who admitted to not having an established policy did describe emerging or partial policies that would in the future contribute to an overall knowledge transfer policy. They gave examples of component parts of a future knowledge transfer policy, such as knowledge transfer frameworks, knowledge management standards and intellectual property policies. They spoke about the need for policies on knowledge transfer, but had not yet fully developed them. One chief executive officer pointed out that his organisation put in 'an awful lot of practice' transferring knowledge, but had not documented this in a policy. This suggests a reliance within TAFE institutes on the informal and tacit.

Strategies for knowledge transfer

Within these institutes, a practical rather than policy approach to knowledge transfer was demonstrated. This was shown by the high level of encouragement of sharing and distribution of teaching and other organisation knowledge between more-experienced teachers and less-experienced teachers. Almost all middle managers confirmed that they were actively doing this. Of chief executive officers and human resource managers, more than 60% claimed to be doing this, and of senior educational managers, more than 50% were engaging in such activities.

This finding supports other research which has identified a culture of knowledge sharing networks of teaching staff in Australian VET providers, fostered by national funding through

Reframing the Future and Australian Flexible Learning Framework initiatives which encourage collaboration (Symons 2001; Mitchell & Young 2003).

More specifically, all informants were asked to report on their usage of a series of practical strategies for facilitating knowledge transfer taken from the Knowledge Management Toolbox of the UK National Health Service (see table 1).

The findings again showed a broad level of agreement across all informant groupings. The three most commonly used strategies involved bringing people together: identifying and sharing best practice, communities of practice and mentoring. Of chief executive officers, human resource managers and senior managers, 93% selected identifying and sharing best practice as a strategy that their organisation used. Of middle managers, 82% used this strategy. Mentoring was a strategy more favoured by middle managers and chief executive officers, and communities of practice were more favoured by senior educational managers.

It was apparent that in many cases strategies were used in an informal manner—that is, there was not always a formal policy in place that supported regular and efficient use of the process. Further, there was some discrepancy between the way some strategies were understood by informants and the way they were described in the glossary notes accompanying the interviews and the questionnaires. For example, peer assists were most likely viewed as meaning peer support, and knowledge harvesting as sharing good practice. However, all strategies were reported as being used, even if some at very low levels.

Each group of informants had its own profile of usage of these strategies:

- ✧ Chief executive officers and human resource managers reported using four top strategies, adding exit interviews to the three most common strategies. All of these were knowledge-exchange activities, not knowledge-collecting ones. For this group, exit interviews were as popular as communities of practice, both being used by 50% of informants in this group. However, fewer informants in this group used each of the other strategies.
- ✧ Senior educational managers used considerably more of the strategies than other informants, and were the only group to include knowledge-collecting activities. In addition to the top three strategies, more than 40% reported using storytelling, knowledge harvesting, after action reviews, knowledge centres, knowledge audits, and exit interviews. Their reported use of communities of practice was 25% more than that reported by chief executive officers and human resource managers.
- ✧ Middle managers reported nearly 20% greater use of mentoring than other informants, but less than 40% used communities of practice and exit interviews, a lower usage than other informants. They reported using few other strategies.

In reporting how these strategies were integrated in their institutes, informants often emphasised the key role teams played in the process:

The full emphasis in this organisation is on teams—about not only harnessing energy and activity but harnessing knowledge as well.

We have a very teams-based structure: team meetings all the time, planning sessions as a team. So there is a fair amount of information sharing, sometimes informal, other times more formal, fortnightly meetings where everyone reports on what they're doing, and lots of forums for getting information.

Promotion and support of knowledge transfer

Promotion and support of knowledge transfer strategies occurred at both the organisational and delivery area level. There was considerable agreement on the use of organisational structures to promote the sharing and distributing of knowledge.

Chief executive officers and human resource managers saw themselves as pivotal in this promotion, though the human resource managers seemed to have more knowledge of teaching staff responsibilities in teams and specific positions. Both of these groups said that structural support was important, whether in staffing or knowledge transfer. Senior educational managers agreed with chief executive officers that structural support came from policies and procedures, specific allocation of responsibilities and funding. They emphasised the support to knowledge transfer offered by team-based structures.

Support was also provided by particular staff who were tasked with knowledge transfer responsibilities. Nearly 70% of all chief executive officers and human resource managers, and nearly 60% of both the senior educational managers and middle managers, were able to identify staff with specific responsibilities for knowledge transfer scattered throughout their organisations (such as librarians, coordinators, communications officers and informal advocates). Some informants also identified new staff appointments, such as a delivery enhancement officer, a manager of performance and strategy, and a flexible learning manager.

However, support was not always seen as being formalised, particularly amongst senior educational managers. Beyond the structural approach, all informants saw forums such as meetings and conferences as the second most common means by which sharing was encouraged, followed by mentoring and professional development.

Benefits of knowledge transfer

Senior managers were asked what they considered to be the major benefits of creating avenues for transfer of knowledge from experienced teachers to those less experienced. This group looked at the higher level benefits to the organisation such as efficiency (mentioned by 50% of informants), quality of service (48%), cultural benefits (30%), and professional benefits (18%). In summary, these informants believed that:

- ✧ efficiency gains could be made through less reinvention of the wheel, fewer mistakes and increased co-operation
- ✧ increased service quality could be gained through the knowledge and skill level of teaching staff
- ✧ cultural benefits included enhanced pride, organisational morale, team ethos and sense of tradition. Institutionally, continuity was maintained and organisational knowledge not lost, sustaining the organisations and their reputations
- ✧ professionally, teachers benefited from an eased workload, increased pride and confidence, and less stress. New teachers were better informed and equipped.

Middle managers were provided with a listing (drawn from the literature) of some of the benefits that could be gained from creating avenues for transfer of knowledge (appendix H of the support document). They were asked to select what they regarded as the three most important benefits. The middle managers' ranking of the benefits of knowledge transfer are in table 10, appendix I of the support document.

While senior managers had commented on efficiency, quality and cultural benefits, middle managers focused on learning and team work. The most beneficial outcome of knowledge transfer activities, selected by 78% of middle managers, was the fostering of a learning culture within teams. This was followed by avoiding reinvention of the wheel (67%) and building the skills of novices more quickly (59%). Significant numbers of informants also selected 'most efficient form of professional development' (42%) and 'breaking down teachers' concepts of owning knowledge' (38%). Middle managers said:

Overall you get continuous improvement. We don't make the same mistakes. For the less experienced, they basically get a kick start and don't have to develop everything themselves. Less experienced teachers need to learn about the context in which we deliver. Experienced teachers see themselves as leaders, as people with skills to offer, and are valued.

Barriers to knowledge transfer

Overwhelmingly all informants considered that work overload, or perception of overload, was the prime barrier to knowledge transfer activities. Over 70% agreed that there was a lack of time to take part in knowledge transfer activities. One informant commented, 'I think staff are just really, really busy'. However, another expanded on this view with the comment: 'Busyness is the major impediment to knowledge transfer—working too hard rather than working smarter'.

The second most commonly perceived barrier, although to a far lesser extent than the time/workload issue, was a reluctance to document knowledge. This reluctance may be caused to some degree by lack of time, as suggested by the following comment:

When you set your priorities, it [knowledge transfer] is probably not your priority. We certainly see a lot of enthusiasm and willingness to share, but with the workload and time—you get on with your own stuff.

Senior institute management agreed that the third main barrier was reluctance to share, though fewer than 40% of the informants selected this as a barrier. Even fewer middle managers considered this an important barrier (23%). The chief executives did, however, explain some of the reluctance to share by describing a number of attitudinal barriers that could contribute to a reluctance to share knowledge. These included personal pride and independence, a sense of competitiveness, shyness and lack of motivation. Opposing attitudinal barriers—with identical effects—were described thus:

Knowledge makes some people feel secure, sharing it makes them feel insecure.
Some don't see their knowledge as being valuable, because they often see it as downgraded. TAFE don't want that anymore. They feel downgraded themselves. In automotive trade, parts are just replaced now.

Reluctance to share was also seen as simply a lack of awareness or lack of value being ascribed to sharing knowledge.

Senior educational managers' opinions on other barriers varied little. Few considered 'knowledge sharing not a priority' to be a barrier and all those interviewed allocated relatively low importance to 'lack of reward', 'reluctance to accept others knowledge', and 'lack of goodwill'.

Middle managers provided greater differences in responses. After the major barrier of workload demands, all other barriers received moderately low scores. Middle manager views on barriers to effective knowledge transfer are outlined in table 11, appendix I of the support document.

One middle management respondent recognised the cultural basis of many of the barriers to knowledge transfer when he stated:

We have a culture that has built up where intellectual property was seen to vest in yourself and it hasn't been captured in the past. So to me the biggest thing to breaking this whole thing is going to be the breaking of that culture, really the intellectual property abyss in the organisation.

These findings about barriers reflect many of those from studies undertaken by Shivahumar (2002), Martin (2003), and Truch (2001).

Insights from non-VET settings: Knowledge transfer

A key question posed by this research and asked of all informants was: what knowledge transfer strategies might TAFE adopt or adapt from outside the VET?

While many acknowledged the need for a business perspective, they had not often looked beyond the VET sector for inspiration or example. Of chief executive officers and human resource managers interviewed for this study, less than half (38%) said that they knew of knowledge transfer strategies from outside the sector that would be useful in their organisation. Of senior educational managers, even fewer (31%) were able to describe useful strategies from elsewhere. Many of the examples they gave were general rather than specific.

Significantly, a common observation made in response to this question was that business models might not work for them because TAFE is different from other businesses. Senior managers in particular expressed the view that the sector was unique in its business nature, its workforce and funding.

In the literature surveyed during this study there is considerable evidence of knowledge transfer being used profitably outside the VET sector. In the world of business, it is often seen as a means of enhancing organisational performance, of developing a leading edge, and a way of organisations learning from the considerable experience and expertise that resides in the brains of individuals and groups of employees. This suggests that it might be possible for TAFE institutes to learn from what other businesses outside the VET sector are doing to meet the challenge of sustaining their skill base.

Appendix J: Knowledge transfer in action (in the support document) describes a selection of approaches gathered from informants in the study, the literature, and a broad scan of business and knowledge transfer-related websites. In most instances, they represent only a small component of whole-of-organisation approaches to sustaining the skill base of these enterprises. Examples included are:

- ✧ Mentoring schemes at Bluescope Steel (formerly BHP) and Fremantle Hospital in Western Australia where new and relatively inexperienced workers are supported by highly experienced mentors or teachers as they learn key skills and knowledge and develop a sound understanding of organisational culture and critical workplace practices.
- ✧ Yellow pages directories in the Public Service Commission of Canada, Statistics Canada and the multi-national company BP Amoco are designed to assist people within these organisations locate internal sources of knowledge on organisational or technical issues. The telephone or intranet listings are organised according to areas of expertise and those seeking specific information can contact people who have volunteered themselves as subject matter experts.
- ✧ Storytelling experiences at the World Bank involve subject matter experts describing planning processes and outcomes so that others can learn from their experiences. Taped information and supporting documentation are made available via websites and the directories are further supported by electronic communication as well as mentoring where feasible.
- ✧ Systematic knowledge transfer systems at legal firm Clayton Utz involve solicitors sharing their knowledge by posting it on the company intranet for use by others. The system is put together in such a way that knowledge transfer has become part of an automatic process—those that use the knowledge are also committed to populating the intranet with knowledge that they have gained through their own experience.

Appendix K: Integrated knowledge transfer models (in the support document) provides extended descriptions of more extensive integrated approaches to knowledge transfer that have some potential for application in TAFE institutes. These models have been drawn from organisations

that have identified a need to sustain critical knowledge and establish strategies to enhance knowledge sharing. Following is a brief outline of each of these models:

- ✧ With an ageing workforce, the Tennessee Valley Authority (TVA) is likely to lose 40% of its workers through retirement in the next five years. As the largest public power company in the United States, the authority's competitive edge and achievement of its mission is dependent upon the skills and knowledge of the workforce. However, much of the highly technical knowledge in the company is held in the heads of workers. As a consequence, the authority is setting in place strategies to retain critical knowledge/skills or ways of lessening the impact of losing them using internal best practice sharing, communities of interest, designated expert networks, recording and codification of explicit knowledge and mentoring to transfer tacit knowledge. This whole-of-organisation approach to sustaining their skill base demonstrates what can be done in a large, widely dispersed organisation.
- ✧ The National Health Service in the United Kingdom has developed a ten-year pathway to change the health service and its 1.25 million staff. The major focus is on knowledge transfer and knowledge management, and the strategies include the National Electronic Library for Health, Learning Zone (including support networks, tutors, and mentors) and the Knowledge Management Toolbox. The toolbox is a particularly valuable resource, as it outlines a full range of strategies for managing critical knowledge and for generating knowledge transfer.
- ✧ The Generic Learning and Teaching Centre in the United Kingdom is a knowledge centre which disseminates and transfers information on good practices and new technologies in learning, brokers information and knowledge, facilitates networks and fosters communities. It connects users to projects, resources, news and networks and has a project underway which focuses on supporting new academic staff.
- ✧ As with many other organisations, an ageing workforce is a significant issue for Australia Post. Strategies for sustaining the organisation's skill base include: collaborative research into the management of worker retirement and subsequent knowledge loss, succession management, the establishment of a talent pool and an online learning centre together with an awareness campaign and a mentoring program.
- ✧ The Canadian Government Public Service has undertaken a number of initiatives as a result of research which identified ageing as a significant concern for the quality of ongoing service provision. In a knowledge sharing pilot project, Transport Canada has tested the viability of knowledge capture, codification, display and retrieval methods for use in transferring critical organisational knowledge between subject matter experts and their successors. In particular, the Transport Canada approach emphasises the importance of integrating knowledge transfer with recruitment, retention and training activities in a holistic strategy.

What then can be learned from these models?

Key factors for effective knowledge transfer

In analysing the range of approaches adopted by these organisations to transfer critical knowledge from highly skilled employees to those less experienced, the following factors appear to be common.

The first common factor is attitudinal and cultural. Approaches to knowledge transfer in these organisations are based on an attitude of respect and open valuing of the tacit knowledge that resides with individuals. The organisations have placed considerable emphasis on building a culture of knowledge retention—keeping it at the forefront of employees' minds, even the youngest and the least experienced. They echo the critical activities in the knowledge transfer 'enculturation' of an organisation proposed by Truch (2001): engagement, empowerment, entitlement, enablement and environment. They embody the recognition by Smith and McKeen (2002) that cultural change is inevitably a long-term activity.

The second common factor is the establishing of a process with people at its core. While much literature is concerned with the role of technology in managing knowledge, these organisations recognise the importance of engaging and motivating people to share the critical knowledge that they possess. In particular, these organisations have:

- ✧ placed people at the centre of the activities, with information technology viewed as a supportive tool to capture, share and re-use knowledge rather than the key focus
- ✧ set in place clear mechanisms for identifying critical knowledge and determining the extent to which that knowledge is at risk of being lost
- ✧ spent time clarifying the purpose of knowledge transfer activities with employees in order to allay concerns and motivate them to be actively involved
- ✧ made decisions not only about who has the knowledge that needs to be shared, but also who needs to receive the knowledge, and what incentives are needed to ensure people are happy to engage in the sharing process
- ✧ shown an understanding of the possibilities of various knowledge transfer practices and have initiated a range of activities—not just one—to ensure that transfer/retention occurs.

The third common factor is the integration of knowledge transfer organisation-wide. To do this organisations have:

- ✧ placed knowledge transfer within larger strategies that include documentation of knowledge, education and training
- ✧ included knowledge retention considerations in recruitment, workforce planning, and development and succession planning, as evidenced by phased retirement and use of retirees
- ✧ balanced the cost of knowledge transfer against the cost of training or re-training—or if knowledge has been lost, determined the cost and feasibility of recovering the knowledge.

While this analysis of common factors deals with attitudes, processes and policy, these organisations also demonstrate a financial commitment. Hence, knowledge sharing and transfer are well resourced.

Implications for policy and practice

In this research into sustaining the skill base of Australian TAFE institutes, a significant number of the managers in the 16 institutes included in this study confirmed that:

- ✧ they were likely to be affected by knowledge loss in the near future due to departure of their ageing teaching workforces
- ✧ they were experiencing some difficulty in recruiting new staff with the broad range of skills needed to meet the learning demands placed upon them by individual learners and industry
- ✧ workloads were key factors impeding the effective knowledge transfer and upgrading of vocational competency.

For these managers and their organisations there is a potential erosion of teaching skills and knowledge at a time when TAFE institutes are being called upon to address the skills development needs of the broader Australian workforce. These managers acknowledge their institutes' skill base as a key economic resource for their business, and the essential role it has in maintaining their credibility and relevance as legitimate players in the education sector.

The current situation for many managers is that they are only on the edge of acting—or planning—to develop policies and practices that will deal with the challenge of sustaining their institutes' skill base. However, they do acknowledge the challenges and are engaged in defining the issues. During this study they described a range of imperatives that will direct policies and practices to develop their teaching workforces in the next five years. Major imperatives were:

- ✧ Educational renewal

Educational renewal was seen by senior managers as a major imperative for the teaching workforce within TAFE institutes in the next five years. The managers described the characteristics of teachers required to keep pace with the changing nature of work and the emerging needs of industry. This meant to be 'technologically savvy': skilled in information and communication technology, flexible learning, online and workplace delivery. It also meant to subscribe to the concepts of learner-centred teaching. These teachers must have industry currency, credibility and strong relationships with workplaces. They must also have their vocational competencies sustained by training and re-training in industry, ongoing professional development and mentoring.

- ✧ Workforce management

Generally, the managers across the 16 institutes believed that a key factor for the future teaching workforce was having a clear management perspective on the composition and structure of the teaching workforce, rather than having an *ad hoc* approach to workforce planning.

Despite the diversity of TAFE institutes and the opinions that hold sway in them, there was a recognition that perceptive managers who know their staff and their industry, and who embed flexibility into the way they work, will best lead education renewal.

✧ Flexibility

The concept of flexibility was seen to be a key factor in achieving a renewed teaching workforce—whether in employment arrangements, cross-skilling or delivery techniques. As one senior manager said:

The learning in the last five years has changed—it is not simply face-to-face that has changed; it is the complexity of meeting the different ways, different locations and different clients that are the focus of training. We have to ensure that the people that we bring in, we actually train, we give them good survival skills in the classroom and we have to explain the principles of teaching and learning and assessment practices, so that they are able to respond to the new training agenda.

Identifying three major imperatives for their teaching staff, middle managers ranked increasing the flexibility of the teaching workforce and increasing teacher skills as almost equally important. The management of an ageing teaching workforce, interestingly, was ranked as the least pressing problem to be addressed by those managing delivery areas for the next three to five years. Further details of middle managers' ranking of major imperatives are provided in table 8, appendix I of the support document.

These imperatives have the following implications.

Development of a knowledge culture

Both the findings of this study and the associated literature review suggest that to sustain their skill bases, institutes will need to develop environments in which a knowledge culture can flourish. To achieve such an environment, policy needs to underpin a range of integrated practices. Knowledge transfer needs to be integrated with workforce planning and development, and active monitoring of workforce trends. These integrated practices can be expressed through whole-of-organisation strategies that work towards sustaining the intellectual capital of the organisation.

The creation of such a knowledge culture needs to be based on sound research of the status quo—firstly by an audit of existing skills and knowledge held by the teaching workforce. Armed with clear information about the retirement intentions of the teaching workforce, the current organisational structure, and with an understanding of existing structures, infrastructure and human resource practices, managers within institutes can determine:

- ✧ what skills gaps there are, and what skills will be lost as a result of ageing—and when
- ✧ what skills are critical to the organisation now
- ✧ what skills can afford to be lost
- ✧ what impact there is on the organisation from knowledge loss
- ✧ what the costs are of training or retaining staff.

With such results, the organisation can make decisions—for example, whether to recruit new teaching staff, matching particular skill sets to meet new organisational directions and emerging training needs. Other decisions might be around whether to re-train with professional development activities—or to train. Further decisions might determine whether to retain teaching staff and use knowledge transfer activities to benefit from the skills and knowledge they possess. This process will be fostered by the growing perceptions within TAFE institutes that the departure of members of an ageing workforce can be as beneficial as it can be detrimental.

Processes and resources

The findings of the study further suggest that integrated practices that sustain an institutes' skill base also need to be cyclical. This ensures that the financial costs of recruitment, training, re-training, retaining and knowledge sharing and transfer are continually balanced.

Such a cyclical process—and knowledge culture—will require resources and ongoing support from policy-makers, funding bodies and institute management. It will also require a commitment from TAFE practitioners and incentives for them, because without active and generous participation on their part a culture of knowledge sharing and transfer will not be possible.

Further, there will need to be resourcing and incentives for both workforce planning and professional development that goes beyond the funding provided within institutes and by national professional development and flexible learning initiatives. This will allow appropriate targeting of the specialised training needed to maintain the vocational competency and high-level teaching skills so essential for learning specialists in the knowledge economy.

Innovations

This study has shown a lack of awareness of strategies from outside the sector, and low levels of belief in the relevance to TAFE of outside strategies. National initiatives within the sector such as Reframing the Future, LearnScope and Flexible Learning Leaders must be at least partially the reason for the strong support captured by this study for strategies such as identifying and sharing best practice, using communities of practice and fostering work-based teams. Indeed, the very existence of these widespread national initiatives is an encouragement for TAFE teaching staff to look within the VET sector rather than to look to business for guidance or inspiration.

However, information, guidelines and models of good practice accessed from outside vocational education and training during this research can provide insights and guidance for innovations to sustain the skill base in TAFE institutes. The variety of solutions on offer provide a rich resource for managers dealing with the complexities of sustaining a skill base, managing an ageing workforce, overcoming resourcing, attitudinal and practical impediments, and the conflicts and challenges inherent in these undertakings.

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Support document details

Additional information relating to this research is available in *Sustaining the skill base of technical and further education institutes: TAFE managers' perspectives—Support document*. It can be accessed from NCVET's website <<http://www.ncver.edu.au.html>>. This document contains:

- ✧ Appendix A: Literature review
- ✧ Appendix B: Letter to chief executive officer
- ✧ Appendix C: Information to participants
- ✧ Appendix D: Organisational consent form
- ✧ Appendix E: Consent form
- ✧ Appendix F: Interview schedule: CEOs and HR managers
- ✧ Appendix G: Interview schedule: Educational senior managers
- ✧ Appendix H: Questionnaire for middle managers
- ✧ Appendix I: Additional data on middle manager responses
- ✧ Appendix J: Knowledge transfer in action
- ✧ Appendix K: Integrated knowledge transfer models



The National Vocational Education and Training Research and Evaluation (NVETRE) program is coordinated and managed by the National Centre for Vocational Education Research, on behalf of the Australian Government and state and territory governments, with funding provided through the Department of Education, Science and Training.

This program is based upon priorities approved by ministers with the responsibility of vocational education and training (VET). This research aims to improve policy and practice in the VET sector.

Research funding is awarded to organisations via a competitive grants process.

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