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CENTRE FOR THE ECONOMICS OF EDUCATION AND TRAINING

**How can VET systems meet the challenges
of innovation and
new skill requirements?**

An exploration of State and Territory
initiatives in Australia

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WORKING PAPER No. 59
April 2005

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Executive Summary

This paper reports on a CEET project that explored policies, programs and other initiatives by Australia's states and territories to support innovation, and to build VET capability to respond to its effects on skill needs. The project was undertaken in late 2003-early 2004.

CEET set out:

- To document the range of initiatives adopted by the states and territories, their rationales and objectives, funding and major features.
- To highlight similarities and differences between the approaches and the various emphases being given to different aspects of VET, to types of skills and innovation and to VET-industry relationships.
- To highlight 'good ideas' and best practice approaches.

It was not possible to consider all types of innovation initiatives, thus investigations were limited to those aimed at supporting and promoting innovation in industry and enterprises and those seeking to strengthen VET responses to innovation. Initiatives supporting innovation in research centres, or providing tax breaks for research and development activities were also excluded from consideration.

To provide a comparison with the Australian experience, the project also investigated England's Centre of Vocational Excellence (CoVE) program, which the UK Department for Education and Skills sees as a 'key driver' in enhancing the further education sector's contribution to meeting the nation's current and future skills needs'. These investigations are reported in a separate CEET working paper.

Findings

1. General approach to innovation

Overall, the states and territories have adopted either a 'whole of government approach' or a more 'decentralised' approach to the challenges of innovation.

Governments taking the 'whole of government' approach have articulated a central set of objectives and implemented an overall strategy to meet them. The central vision is often framed boldly and is ambitious in the outcomes it hopes to achieve. Government departments and agencies have developed plans and strategies that align with the central vision and implemented policies and programs that will contribute to the achievement of the overall objectives. Links are apparent between industry policy and VET policy.

Some other governments have taken a more 'decentralised approach', with departments and agencies developing their own objectives and initiatives to meet the challenges of innovation. Though a lack of co-ordination and integration might be expected under this approach, it is not necessarily so. The different objectives and plans of the various government departments and agencies are all built on government policy - and thus reflect similar views and aspirations, though within different contexts.

The states' and territories' interest in innovation stems primarily from a view that it will lead to economic and social benefits. Invariably the documentation which announces and explains the various state/territory innovation plans, strategies, policies and programs refers to 'economic prosperity', the 'generation of jobs and wealth' and the development of 'export potential' through innovation. Valuable potential outcomes of innovation include also the improvement of current practice – increasing efficiency and better meeting needs – and the reform of existing industries so that they become more 'sustainable' in the longer term.

2. Innovation Advisory bodies

Most states and territories have established a body to advise the government on innovation issues. The members of this organisation generally include representatives of government, industry and the science, technology and research communities, including universities. Formal representation of the VET sector on these bodies is unfortunately rare.

3. Initiatives supporting innovation in industry and enterprises

The states and territories are giving substantial attention to the promotion and support of innovation in industry and enterprises. Two types of initiative are especially common: programs to support the commercialisation of new products and services; and grants to support innovation and related activities. In addition, policies and programs often reflect particular strengths or interests at the state/territory level, such as targeted support for the advance of 'Desert Knowledge' in the Northern Territory, and the Biotechnology and Sustainable Energy industries in Queensland.

4. VET initiatives

In their education and training policy statements and VET plans, all the states and territories identify that innovation presents challenges for their VET systems and that action is needed to meet these challenges.

The initiatives the states and territories are implementing to build VET capability to respond to innovation tend to have two features in common. The first is an emphasis on supporting partnerships, networks, or other arrangements that bring together representatives of VET (providers, planners) and of industries or enterprises to promote a better mutual understanding of the nature of changing skill needs and joint work to establish appropriate training provision as soon as it is needed. The second is the provision of support for VET providers to develop new resources, products and services to meet changing skill needs.

However, within this commonality, there are also many differences in initiatives, with states and territories choosing to support different types of collaborative arrangements and to vary the ways in which initiatives are funded and the levels of funding.

5. Strengths and weaknesses in initiatives

Most of the innovation initiatives identified in this project had either been in place for only a very short time, or were still in the course of being implemented. Thus though many appeared to be ‘bright ideas’ it was too early to judge how effective individual initiatives were, or to identify any particular features contributing to their success. However, it was possible to identify a number of general areas of strength as well as some areas where improvements are possible.

Strengths

1. The level of attention – and funding – the states and territories are giving to the challenges of innovation is substantial and growing. Some additional funding is being allocated as well as some funding re-allocated from other areas. Initiatives are also being framed to encourage funding from non-government sources.
2. The states and territories are developing a diverse range of initiatives, across a number of government departments and agencies. The challenges of innovation are thus being tackled from a number of directions, rather than a single front. In addition, there is evidence of considerable co-ordination in some cases formal collaboration, between government departments and agencies.
3. In developing their initiatives the states and territories appear to be taking account of some of the features and characteristics of their region and the particular challenges and opportunities they offer. Some initiatives are also being implemented that are tailored for the needs and opportunities within a particular sub-region of the state or territory. This attention to local characteristics and needs is an important development.
4. There is a very strong emphasis in the initiatives on the development of partnerships, networks and other collaborative arrangements bringing together representatives of VET and industry, government, and other bodies to consider changing skill needs and how they might be met. These arrangements support the flow of knowledge and ideas and thus greater mutual understanding. They also promote collaboration in finding solutions to needs and problems.

Areas for improvement

1. Almost all of the states and territories had established bodies to advise the government on innovation, or innovation-related issues. These bodies usually included representation of government, of industry, of higher education and of the science and research communities. However, they rarely included a formal representative of the VET sector. This devalues the important role of VET in supporting innovation and it neglects the need for the sector to be informed of new developments early on to enable it to frame responses that are both appropriately and timely.
2. State and territory policy documents on innovation and initiatives are strongly focused on the needs, challenges and opportunities within their particular region.

However, regional borders often do not reflect the ways in which people form communities and in which industries cluster, nor the characteristics of particular geographic areas, or education and training provision. Although states and territories share many goals and aspirations there do not currently appear to be initiatives that involve co-operation or collaboration across state/territory borders. These could potentially play a useful role in supporting innovation and training in cross-border communities and industries.

3. Most states and territories have implemented centres and on-line sites to provide resources and other assistance to support innovation and the commercialisation of new products, processes etc. There appears to be considerable duplication of effort and thus a more co-ordinated, collaborative approach might thus free up resources.
4. Though this project did not specifically look at innovation initiatives undertaken by VET providers a number of VET providers indicated that they these activities can require substantial resources, particularly in staff time. There is also an element of risk in making a decision to undertake these activities, due to uncertainty about the return on their investment. Some providers expressed a view that they were 'doing it on their own', and received inadequate support or recognition for their effort from within the VET system.

Conclusions

Although the states and territories are working to support innovation in industry and enterprises and to build VET capabilities to respond to it, there is no doubt that more could be done and some activities could be more effective.

More co-operative and collaborative work is needed to reduce the current level of duplication in the provision of web-based support. This might consider the joint development and provision of training resources as well as information to assist the commercialisation of innovation outcomes.

Currently VET is poorly represented on innovation advisory bodies to governments. There would be benefits from including VET representatives among the members of these bodies. This would allow VET systems early access to knowledge about the directions of innovation; it would also provide governments and industries with information about the kinds of VET responses that would be possible – and where further effort is needed to support the provision of appropriate and timely training.

Further opportunities could also be given for VET personnel to contribute to research and development, particularly in industry sectors in which they have a high level of expertise. The Western Australian Science and Technology Innovation fund, which provided grants for training providers to collaborate with industry, universities, government and other bodies to undertake innovative science and technology projects with training outcomes might, for instance, be used as a model for this type of development.

There is considerable potential too for the states to learn from each other. Dissemination of information about the success of the various initiatives would enable other governments to adopt and adapt those that prove to be particularly effective. Some good

ideas and practice suggested during this project that might be considered more widely include:

- initiatives connecting VET and industry policies so that training implications are considered as a matter of course
- initiatives which consider the implications for VET of the innovations they are supporting – VET included, e.g. industry clusters in South Australia
- initiatives incorporating collaboration across state/territory borders
- efficient use of the worldwide web to disseminate information and collect data
- initiatives which demonstrate learning from previous experience
- attention to resourcing issues
- initiatives which enable VET staff to increase their expertise in new areas
- initiatives which build on established expertise in VET, and
- initiatives which seek to develop new specialisations in VET.

¹1. Introduction

Innovation

A 'google search' using the phrase 'what is innovation?' produces a long list of definitions published on the worldwide web. Some are short and simple:

the development of new products, services, etc.
(www.asset-analysis.com/glossary/glo_025.html)

n. (IC) The act of creatively beginning or introducing something new.
(www.innovationcentral.org/glossary1.htm)

Some emphasise that innovation goes a step further than an idea or invention, entailing the development of a specific product, device or process:

Innovation is the whole process from: invention, development, pilot production, marketing, production. Invention is just invention (Innovation = creative idea + implementation.)
(www.tkb-4u.com/glossarylist/glossary_in.php)

A new idea, method or device. The act of creating a new product or process. The act includes invention as well as the work required to bring an idea or concept into final form.
(www.pdmamn.org/NPD%20Glossary.htm)

Some define innovation within very particular contexts:

(*innovation*) is an evolutionary process of increasing the capability to apply a technology, applying in new contexts, expanding the capability of a technology or improving the capability of a product.
(www.ee.wits.ac.za/~ecsa/notes/glossary.htm)

An intentional change to a chain letter. May be a modification, addition or deletion. Often one judged to have a significant positive effect on propagation.
(www.silcom.com/~barnowl/chain-letter/glossary.htm)

One suggests that through over- or mis-use, the word 'innovation' is becoming meaningless and that this may see the rise of a new word:

A new idea, method or device. One of the most overused nouns in the business vocabulary today...We are counting the days until we hear the buzzword "re-

¹ The author is very grateful to Professor Chris Selby Smith for his useful comments on an earlier version of this paper.

innovation.”
(www.logisticsfocus.com/Glossary/glossary-i.asp)

Despite their differences, these many definitions have in common the notion of innovation as the creation of something new in order to achieve a benefit such as greater efficiency or higher quality, or to fulfil a particular need. Innovation is thus both a process, and the outcome of this process.

Innovation may (but does not necessarily) build on, or replace, something that already exists:

An improvement of an existing technological product, system, or method of doing something.
(www.iteawww.org/TAA/Glossary.htm)

Innovation is creating something that others want.
(www.sasked.gov.sk.ca/curr_content/entre30/helppages/glossary/glossary.html)

and while the outcomes of the innovation process (ie ‘innovations’) usually take a tangible form, such as a new method, product or tool, they can also be intangible, such as an idea, or way of behaving:

(Innovation is) ... The process of adopting a new thing, idea, or behaviour pattern into a culture.
(www.metainnovation.com/certificationcenter/resources/glossary.htm²)

Innovation and skill needs

This project is concerned with the ways in which innovation can lead to changes in the demand for skills in the labour market and the implications of these changes for vocational education and training systems.

Many of the web-published definitions of innovation point to its importance in a competitive commercial market for goods and services, and the advantage that innovating can bring to businesses:

Innovation ... is the mechanism by which a business positions and differentiates itself in the mind of the consumer.
(www.e-myth.com/mastery/glossary.htm)

The ability to craft often radically new solutions/products is often viewed as one of the sole sustaining competitive advantages of the modern firm.
(www.sims.berkeley.edu/courses/is213/s99/Projects/P9/web_site/glossary.htm)

² This definition is taken from the work of Schumpeter, published in 1934.

Pressure on commercial enterprises to become more innovative has increased in recent years as the idea that innovation is critical to maintaining and expanding market share and entering new markets successfully has become more widely accepted. Pressure to innovate has also been increasingly exerted on non-commercial enterprises and organisations (including educational institutions), particularly to increase efficiency and find better ways of meeting ‘client’ needs and preferences.

For these reasons, in Australia and many other countries, innovation now takes place on many different sites. The formally recognised ‘national innovation system’ is extensive and includes government programs supporting research and development and the marketing of new products; a network of laboratories and testing facilities supported by government and the private sector; university companies, technology parks and incubators; and key research facilities, including CSIRO (the Commonwealth Scientific and Industrial Research Organisation), the Cooperative Research Centres, and universities³. However, innovation occurs also in many individual enterprises, industry bodies, homes, government departments and agencies, and educational institutions in addition to universities.

High and increasing levels of innovative activity are leading to changes in the types of skills sought by commercial and non-commercial organisations and enterprises. Innovation both requires skills and can create needs for new or different skills. The innovation process requires skills in research and management at different stages to carry out the developmental work and to implement new methods, tools or products. When an innovation such as a new tool, process or product is adopted some existing skills, such as technical skills in operating new machinery or installing and maintaining new products, may become redundant and some new skills may be required. Previous research (Ferrier, Trood and Whittingham 2003) suggests that innovation is likely to lead to increased needs for:

Technology-related skills

- Skills in identifying new applications of technologies
- Skills in developing new technologies, or advancing existing technologies
- Skills in identifying technological solutions to problems

Management skills

- Skills in identifying which innovation outcomes are appropriate for commercialisation
- Skills in knowing when and how to market a new product, tool or process (or other innovation outcome) successfully
- Skills in securing intellectual property rights over innovation outcomes
- Skills in setting up efficient manufacturing processes for new products
- Skills in negotiating appropriate training provision with education and training providers

³ For further information about the National Innovation System consult <http://www.asto.com.au/getstart.htm>

Operative/Technical skills

- Skills in operating new tools or equipment, or applying new methods/processes
- Skills in applying new processes or tools to existing work
- Skills in installing and maintaining new products, and
- Skills in manufacturing new products.

If new and changed skill needs are to be met, access to appropriate education and training is essential. Access must also be provided in a timely fashion so that the skills required for an innovation to be implemented effectively are available when needed. An enterprise will not gain the benefits from installing new equipment if its workers do not have the skills to operate it properly. Finding or providing the right training, in time, can present a challenge. Robinson (2003), for instances notes indicates the difficulties some employers are facing in finding effective ways of keeping workers up to date with technological changes – especially the ‘convergence of technologies’⁴.

The Australian VET system has long played a primary role in providing education and training to meet the skill needs of industry. Research by Mitchell et al (2003) has demonstrated that many VET organisations engage in substantial innovation. Their findings, and discussions conducted with VET providers for this project indicate that providers innovate for reasons including: to meet the needs of students and industry better; to support their staff; to improve their existing practice; and to increase their capacity to gain new business, particularly in the fee-for-service area. Many VET providers also have strong relationships with industries and enterprises (particularly at local levels) that enable them to gain early access to information about innovations and their likely implications for skills needs – though resource pressures, together with the length of time taken to revise training packages, may delay or hinder the development of appropriate training.

The Australian VET system and Australia’s national innovation system have also been traditionally poorly linked. Consequently, VET planners and providers have had limited access to early knowledge and information about changing skill requirements arising from innovation within this system. Their capacity to develop and deliver appropriate training has thus been impaired. People within the VET sector have also missed out on opportunities to contribute to this innovative activity (Ferrier, Trood and Whittingham, 2003).

The project

The *National Strategy for VET: 2004 – 2010* (ANTA, 2004) seeks a VET system which both contributes to, and is able to respond effectively to, innovation. Its sixth strategy is:

(To) Enable training providers and brokers to partner with industry to drive innovation.

⁴ See Lindhjem (2003)

For this project, CEET set out to identify and compare ways in which Australia's states and territories were working to build capability in VET systems to respond to new and changing skill needs arising from innovation. State and territory governments have a major responsibility in the planning and funding of VET in Australia, within a national VET system.

The project's major purposes were:

- To document the range of initiatives (ie policies, programs and other activities) being adopted by the states and territories, their rationales and objectives, funding and major features.
- To highlight similarities and differences between the approaches and the various emphases being given to different aspects of VET, to types of skills and innovation and to VET-industry relationships.
- To highlight 'good ideas' and best practice approaches.

To provide a comparison with the Australian experience, the project also investigated reforms in the vocational training system in England that are rebuilding the system to enable it to meet skill needs more effectively. Investigations focussed on England's Centre of Vocational Excellence (CoVE) program, which the UK Department for Education and Skills sees as a 'key driver' in enhancing the further education sector's contribution to meeting the nation's current and future skills needs'. The centres are expected to be innovative and to 'create specialisms that embed a culture of innovation and technical excellence' (www.dfes.gov.uk).

Work was conducted in two stages. The first took place in Australia in late 2003 and comprised two main activities:

- Examination of printed or internet-published material to identify
 - actions being taken by Australia's state and territory governments and government agencies to support or promote innovation in industry, and
 - actions being taken to build capability in vocational education and training to provide training to meet new skill needs associated with innovation.
- Discussions with people and organisations dealing with relevant issues in three states (NSW, Victoria, South Australia):
 - representatives of state and territory training authorities,
 - representatives of other government agencies concerned with innovation, and
 - representatives of training providers.

The second stage was conducted in the U.K. in early 2004 and comprised:

- Examination of printed or web-published material to establish the background to the establishment of 'centres of vocational excellence' (CoVE) and the nature and purposes of the CoVE program,
- Visits to two centres of vocational excellence and collection of published material about several more centres,

- Discussions with representatives of policy bodies concerned with initiation, implementation and management of the CoVE program, and
- Re-examination of Australian material to identify and note any changes in relevant state or territory policies, departmental arrangements or activities since stage 1.

This paper

This paper reports on the findings of the part of the research project that investigated state and territory initiatives in Australia. A companion working paper reports separately on the investigations undertaken in the U.K. The paper first notes the general approaches to innovation taken by the states and territories, then the specific innovation policy and advisory structures each has set up. Section 4 lists state and territory initiatives supporting innovation in enterprises and industry. VET initiatives are considered in Section 5. Section 6 discusses the range of initiatives, identifying some general strengths and weaknesses in approaches, as well as some unusual or good ideas. Conclusions are presented in section 7.

Limitations

As well as state and territory governments, Australia's Federal Government, VET providers, industry bodies and many individuals in VET organisations, enterprises and research organisations, contribute to building capability in Australia to develop and deliver training to meet new and changing skill needs. For reasons of time and available resources, this project was limited to an examination of state and territory initiatives only.

Across the states and territories the range of programs and activities supporting innovation and an appropriate VET response is extensive. Some initiatives have already been implemented, others are still being planned. In this project, it was possible to identify and discuss only a selection of these many initiatives. In addition, new programs and activities were continually being announced throughout the project, making it impossible to ensure that any list compiled would be complete and up-to-date.

The project thus concentrated on two types of initiatives chosen to reflect the VET system's strong relationship with employers and industry:

- Initiatives to support and encourage innovation in enterprises and industry. Documenting some of these many initiatives underscores the state's commitment to innovation and thus the potential scale of the need to develop VET responses.
- Initiatives to increase innovation in Education and Training or to assist education and training providers to respond effectively to innovation.

However, even within these two groups the specific initiatives identified in the project are not all that exist. In particular, the discussion omits those providing support for activities indirectly related to business and industry, such as research and development in research organisations (e.g. Co-operative Research Centres); and tax breaks for research and development.

2. General approaches to innovation

To various degrees all of Australia's states and territories are taking action to support and promote innovation and to respond to the new and changing skill needs. The approaches the state and territory governments are adopting to meet the challenges of innovation are of two kinds:

1. Whole of government approach

Governments adopting this approach articulate a broad set of innovation policy objectives for the state as a whole and a strategy or plan to meet them. Departments and agencies implement co-ordinated programs, plans and activities that align with the central vision and are designed to contribute to the achievement of the government's overall objectives.

At the time of writing, four states – Victoria, Queensland, South Australia and Western Australia – demonstrated this approach. Each had identified broad innovation objectives and developed (or was developing) a strategy aimed to achieve them through co-ordinated work in its departments and agencies.

Victoria – 'Innovation Economy'

An innovation statement published in 2002, *Victorians – Bright Ideas, Brilliant Future* set out the government's ambitious agenda to develop an internationally competitive 'innovation economy' within the state. It indicated that the government would adopt an *Innovation Economy Policy* aimed at driving innovation by:

- Building an educated and highly skilled workforce.
- Becoming a leader in knowledge creation and innovation.
- Developing linkages, clusters and networks to become a more integrated and networked local economy.
- Fostering high levels of enterprise formation and business growth.
- Becoming a globally focused and internationally integrated economy.
- Creating a business environment and infrastructure base that facilitates business success.

Queensland – 'Smart State'

The government has adopted the slogan '*the smart state*' to indicate its broad policy objective and an Innovation Strategy (*Innovation – Queensland's Future*) designed to achieve this and, ambitiously, to position the state at the 'forefront of the knowledge-based economy' by fostering innovation and technology diffusion across all sectors of industry and encouraging a more general innovative culture across the Queensland community (www.sd.qld.gov.au/dsdweb/htdocs/global/content.cfm?ID=139).

The strategy identifies four 'building blocks' as essential to the achievement of innovation objectives: advancing infrastructure; developing skills; funding innovations and

establishing a culture of innovations. Based on these building blocks it provides support for a range of initiatives under the headings:

- Co-operative Research Centres
- Knowledge and Technology Diffusion
- Technology, Research Parks and Precincts
- Education
- Commercialisation
- Awareness and Promotion
- Innovation in the Public Sector.

South Australia – STI¹⁰.

A 10 year plan for the strategic development of the state was released in 2002 by the State Premier. It includes six objectives and 79 key targets to measure progress toward their achievement. The fourth objective, ‘fostering creativity’ specifically noted innovation:

Fostering creativity – innovation and creativity provide South Australia’s future capital for growth and expansion. The Government recognises its role in providing the right environment for these attributes to flourish in sectors ranging from the arts to manufacturing, and its ability to provide a lead for the rest of the community. Our capacity to do things differently will be one of the keys to achieving all of our objectives. (www.stateplan.sa.gov.au/summary.php)

All government plans are expected to align with the strategic plan and all government agencies are expected to base their plans, budgets and programs on its key directions and strategies.

Very recently, as part of this plan, the state government has released a statement setting out its ‘integrated *Science, Technology and Innovation Vision – STI¹⁰*.’ Overall this ambitious vision is that

In the next decade, South Australia will embrace innovation – the creative use and sharing of knowledge – as a fundamental principle by which we work together to advance the State. This will expand our economy and international competitiveness, protect our natural resources and enhance community prosperity statewide.

(www.innovation.sa.gov.au/innovation/pages/sti_vision).

The vision has ten ‘key elements’ to be realized through 3 ‘interlocking strategies’:

- Building capability and infrastructure
- Momentum through collaboration, and
- Developing people and communities.

Western Australia – Innovate WA

The government has adopted an Innovate WA strategy which aims to:

- Raise awareness of innovation as a driver of economic and technological change,
- Strengthen and improve the educational and research capacity of the state,
- Maximise the commercialisation of ideas by building links between industry and research, and
- Generate more jobs and expand the export potential of the state.

The strategy recognises *ideas, innovation, and initiative* as the keys to developing new knowledge industries and applying knowledge to mainstream existing industries. It aims to ‘encourage innovation across industries and stimulate business and education institutions to work together to generate ideas and commercialise these ideas to the global marketplace’ (p 3).

It looks toward building a science and technology base in schools; expanding the research capacity of universities, colleges and industries; and developing new centres of research excellence.

2. Decentralised approach

Governments adopting this approach have not articulated a specific innovation plan or vision for the state as a whole. Within the boundaries set by government policy government departments and agencies thus develop their own innovation plans and objectives and implement programs and activities to meet them, based on needs and priorities as they see them.

New South Wales, Tasmania, the Northern Territory, and the Australian Capital Territory demonstrated this approach, although some appeared to be moving toward a more whole of government approach.

3. Innovation Advisory structures

1. Whole of government approach

Victoria

The innovation statement, *Victorians – Bright Ideas, Brilliant Futures*, indicated the establishment of a *Science, Technology and Innovation Initiative* (STI) with funding of \$310 million over five years to support programs and projects designed to address ‘development needs and priorities’. These are identified through a consultative process involving people representing education, research and industry and lead by a *Knowledge, Innovation, Science and Engineering Council* comprising the Premier, senior Government Ministers and representatives of research organisations, business and

universities. Unfortunately, the Council does not appear to include a formal representative of the VET system, other than the Minister.

The Council's objectives are to provide the Victorian government with advice on:

1. Priorities for investment in science, technology and innovation.
2. The building of world class research infrastructure.
3. Ways to address the barriers to commercialisation and enhance the development of innovative small enterprises including through innovative intellectual property arrangements and expanding the availability of venture capital in Victoria.
4. Mechanisms to enhance the links between science and research organisations and business, including roundtables.
5. Ways to raise awareness of the importance of science, technology and innovation in the Victorian business and the community, especially among young people.
6. Commonwealth government research, development and innovation initiatives and ways to maximise these for Victoria.

The STI programs and projects are the responsibility of a number of departments: the Department of Innovation, Industry and Regional Development; the Department of Education and Training; the Department of Human Services; the Department of Natural Resources and Environment; and the Department of Infrastructure.

The government has also established an *Innovation Economy Advisory Board* to help it to:

- Identify strategies, challenge current directions, lead or support agreed action that will generate jobs and wealth through innovation.
- Promote Victoria's innovation capabilities locally, nationally and beyond.

The Board is chaired by the Minister for Innovation and also includes the Minister for Education and Training, together with Victorian and international leaders from industry, finance, research and the wider community. However, it does not include any formal representative of the VET system, other than the Minister. (www.innovation.vic.gov.au)

Queensland

Assisting implementation of the government's 'smart state' strategy the *Queensland Innovation Council* is charged with providing 'advice, recommendations and practical solutions on critical, innovation issues' as well as developing and implementing its own annual work plan (www.sd.qld.gov.au/dsdweb/htdocs/global/content.cfm?ID=144).

The Council was suspended due to changes in Ministerial arrangements following the Queensland election of late 2003, with a decision on its future expected during 2004. Meanwhile, advice to government continues to be provided through the *Office of the Chief Scientist*, now located in the newly created *Department of State Development and Innovation*. The state has also established an advisory council specifically in the area of Biotechnology which is chaired by the state's Chief Scientist.

South Australia

The *Premier's Science and Research Council* advises the Government on science and research and development, including industry needs and partnerships, funding opportunities and priority areas for research. In particular, its efforts focus on 'environmental sustainability'. (www.innovation.sa.gov.au/sti/pages/SciCouncil.)

A *Science Technology and Innovation Directorate* (STI) has been established to 'provide a coordinated, whole-of-government approach to the development and implementation of strategic policy advice in science, technology, innovation and the information economy to support the Government's goals of economic development and social inclusion' (www.innovation.sa.gov.au/sti/pages/aboutus).

The Directorate supports the *Information Economy Advisory Board* that provides strategic advice on information economy matters to the Minister for Science and Information Economy (www.innovation.sa.gov.au/sti/pages/IEAB). Members represent education and training, industry, community and government.

Western Australia

A *Science Council* was established in 2001 to provide the government with advice on initiatives to foster a research and development culture and to oversee implementation of the *Innovate WA* strategy. Members of the Council include representatives of VET and higher education as well as business, industry, science and research. (www.sciencecouncil.dpc.wa.gov.au/index.htm)

2. Decentralised approach

New South Wales

The New South Wales government has established an *Innovation Council* to advise the Government on policies and initiatives to encourage innovative activity. The Council advises the government on innovation policies, hosts innovation forums in regions and works to raise awareness of the importance of innovation for sustained economic growth. It sponsors prizes for innovation eg Rural Innovation Prize.

The Council is supported by the Industry division of the *Department of State and Regional Development*. The department provides a range of services to assist businesses, including with innovation.

Tasmania

The Tasmanian government has established a *Tasmanian Innovations Advisory Board* to advise the State Government on innovation policy and its implementation and the *Tasmanian Innovations Program*. Members of the Council are drawn from Science and Business.

The Advisory Board is supported within the *Department of Economic Development*. This department has responsibility for helping ‘Tasmania’s innovators and entrepreneurs, especially those in small to medium-sized companies and start-ups, to commercialise their intellectual property’. It ‘targets businesses and individuals seeking to commercialise innovative products, processes and services that have the potential to generate employment, investment and exports’.
(www.development.tas.gov.au/innovate.html)

Northern Territory

The Northern Territory government has established an *Innovation and Knowledge Economy Unit* in the *Office of Territory Development*. The establishment of the unit is based on the Government view that ‘successful economies of the future will supplement existing economic activity with initiatives based on knowledge and innovation’. The unit thus has responsibility for projects ‘to advance the knowledge-based economy in the Northern Territory’. (www.otd.nt.gov.au/dcm/otd/innovation)

The *Office of Territory Development* is located in the *Department of the Chief Minister* and has responsibility for economic development in the Territory. It works with the *Department of Business, Industry and Resource Development*.

The government has conducted a review of the need for a council to provide advice on Research and Development/Science and Innovation.

Australian Capital Territory

The government has developed a *Canberra Plan* and an *Economic White Paper* that identify the importance of innovation and creativity to the territory’s long-term economic prosperity.

The government has identified the region’s areas of strength as ICT, biotechnology, defence industries, education export and environmental management and looks to as the means to achieving sustainable economic growth in the territory.

The ACT government body *BusinessACT* is a partner in the *Canberra Commercialisation Council* which was established by a non-government body, the Canberra Business Council. The *Commercialisation Council* aims to promote the commercialisation of research and innovation in the territory. It holds forums and workshops to discuss issues affecting commercialisation of the results of research.

The government has established a new *Canberra Partnership Board* to assist in guiding the development of Canberra. The Board has been given responsibility for establishing a mechanism for business and institutions to join and make contributions to the *Canberra Partnership*, which is expected to work to:

- Leverage Canberra’s knowledge assets by increasing the quantity and quality of commercialisation of intellectual property in Canberra.
- Increase the level of exports from and investment to Canberra.

- Attract and retain talented and creative people to live and work in Canberra.
- Market Canberra as a place to live, work and invest.

The Board is supported by the economic development area of the Chief Minister's Department. It will provide advice to the Government on the activities of *The Canberra Partnership Unit*. *The Canberra Partnership* will work with BusinessACT, the business development arm of the ACT Government.

Board members include representatives of industry bodies, businesses, unions, universities and government bodies.
(www.business.act.gov.au/businessnews/canberrapartnershipboardannouncement.html).

4. Initiatives Supporting Innovation in Enterprises and Industry

This section describes state and territory initiatives providing support for innovation in enterprises and industries. It excludes initiatives supporting research and development in research organisations, such as Co-operative Research Centres. It also excludes initiatives providing tax breaks for enterprises engaged in research and development.

1. Whole of government approach

Victoria

Strategic audits conducted by the government – detailed analyses of ‘Victoria’s competitive position, future opportunities for growth and the sort of actions required to capture growth’, identified six core attributes of a modern, innovative economy:

- A strong international focus.
- Capacity to create and use knowledge.
- Strong linkages and networks at home.
- Sustained performance in starting and growing businesses.
- Educated and highly skilled workforce.
- Highly competitive business environment including a leading edge infrastructure base.

An overview found that Victoria is still ‘an economy in transition’ and has not yet reached international standards in ‘a number of areas which define leading edge economies and firms’. However, it has a strong base on which to build an innovative economy, including a skilled, creative and culturally diverse workforce, strong tradition of research capability, rapid adoption of new technologies and a highly developed manufacturing sector’.

Audits have been conducted in nine industry sectors: automotive; environmental management and renewable energy; financial services; metal fabrication; precision engineering; professional and technical services, textile, clothing, footwear and leather;

transport distribution and logistics; and sport and recreation.
(www.strategicaudit.dsr.d.vic.gov.au)

Building Tomorrow's Businesses Today

Identified by the Victorian government as a 'package of measures aimed at positioning Victoria as one of the world's leading and strategic business destinations', this program includes measures aimed specifically at business innovation, providing support for enterprises to:

- Develop new products.
- Apply new technologies and processes to build new core business strengths.
- Develop the skills and business tools to access and make the most of venture capital and new investment.

They include:

Technology Road maps and skill studies (\$424,000 over four years).

To identify future technology and skills needs for industry in strategic and emerging manufacturing sectors.

Technology Evaluation Projects (\$1.9 million over four years).

To encourage companies to evaluate new technologies and provide case study material on the adoption of new technologies for dissemination throughout industry.

Technology Commercialisation and Diffusion programs

The *Technology Commercialisation* program aims to support the growth of new high technology businesses, products and services through the commercialisation of innovations. Twelve private sector service providers (TCP Partners) were contracted to provide support and development services to start-up technology companies including advice on intellectual property management; technology management; strategic planning; international and domestic market planning; and access to investment and finance (www.business.vic.gov.au/4A256B0C00184FC6/All/F2F1B4FCF7CD9EBB4A256B96001043F6?OpenDocument).

The *Technology Diffusion* program offers three kinds of competitive grants:

- *Network grants* – to establish or improve networks of small and medium size enterprises that will facilitate the uptake of technologies.
- *Demonstration and Awareness Grants* - funding for projects to raise awareness, encourage uptake and demonstrate the application of technologies by small and medium size enterprises.
- *Feasibility Studies Grants* - to determine the practicality of a prospective network or Demonstration and Awareness project, or to identify the best way of implementing one.

(www.business.vic.gov.au/4A256B0C00184FC6/All/B2B55601672B4DA54A256B9600112CA3?OpenDocument)

Victorian Innovation Centre

The centre provides services to ‘educate and assist early stage innovators and small businesses, and help to develop and commercialise viable new products and technologies’. Services include consultations and advice; seminars; a mentoring service; and assistance with patents. The centre also runs a program, *Regional Innovation Corridors* to assist rural innovators to access services, resources and expertise to commercialise new products and technologies.

(www.business.vic.gov.au/4A256B0C00184FC6/All/F1D8896B04BC70ED4A256B9600113BC5?OpenDocument)

Queensland

Queensland Innovation Science and Technology

This government sponsored website aims to promote awareness of scientific and technological developments. It is sponsored jointly by the Queensland government and the Commonwealth Department of Education, Science and Training and aimed at the general public, schools, government departments, industry, business and the media. The site provides information about a variety of projects, hosts some activities and ‘snapshots’ about other scientific developments, such as cloning. (www.qist.net.au)

Commercialisation support and advice

The Department of State Development and Innovation provides a number of different forms of support and financial assistance to local businesses and researchers with commercialisation of the outcomes of their work. They include:

Innovation Start-Up Scheme

This scheme provides seed funding via a competitive grants program to help early-stage technology companies to commercialise new products. Funding of up to \$80,000 is available with applicants required to match funding on an 80:20 basis. A further \$5,000 is available to recipients who complete milestones successfully and within the agreed timeframe, for assistance with the preparation of applications for Commonwealth grants or private venture capital.

Technology incubators

Technology incubators provide accommodation, laboratory and office facilities, business support and mentoring for companies that have spun-off from universities, research institutes and other innovation sites. Assistance includes secure access to venture capital and legal, financial and marketing expertise. The Department supports several technology incubators, including i.Lab in Brisbane and the Sunshine Coast Innovation Centre. A third incubator, the BioAccelerator, is being developed for more mature biotechnology companies and will be constructed at the Brisbane Technology Park.

Ideas 2 Market website

This website provides extensive online resources of ‘advice, ideas, hints and links’ to assist ‘innovators and entrepreneurs’ with commercialisation of their ideas. Information is organised according to three business stages: pre-start-up; start-up; and growth. There is also an extensive list of relevant links to organisations or sites offering further information.

([www.ideas2market.qld.gov.au/\(kh0qbr55stnnu0jty3oq5p55\)/home/default.aspx](http://www.ideas2market.qld.gov.au/(kh0qbr55stnnu0jty3oq5p55)/home/default.aspx))

Ideas 2 Market Skills Program

One day Innovators Forums and three-day Commercialisation Short Courses held throughout Queensland.

Biostart and teQStart

The BioStart program provides funding to stimulate the growth of the Queensland biotechnology industry. Through the program young start-up companies are able to access funds for research. Applicants must be able to demonstrate that their project has the potential to become ‘commercially valuable’, ie:

- a product/technology differentiated from its competition
- a large potential market for the product/technology
- substantial income streams as the result of the commercialisation of the project’s outcomes.

In addition, applicants must also demonstrate that they have the management ability to advance the project and clear ownership of intellectual property that will protect against future competition.

Due to the success of BioStart the Queensland Government widened the scheme to include other technologies. A new program, teQstart was launched as a ‘revolving fund’ for early stage innovation development across all technology industry sectors including information and communication technology, environmental management, engineering, electronics, health/medical, nano-technology and advanced materials.

(www.sd.qld.gov.au/innovation/biotechnology/biostart.asp)

Queensland Sustainable Energy Innovation Fund

This program (QSEIF), which began in 1999, seeks to promote innovation in energy efficiency and renewable energy technologies and practices and to establish Queensland as a market leader in energy innovation and sustainable energy practices.

The fund provides support for projects from business or the community on research, development, demonstration or commercialisation of energy efficiency or renewable energy.

(www.epa.qld.gov.au/environmental_management/sustainability/energy/energy_innovation_fund_qseif/)

Queensland Industry Development Scheme

The Scheme is designed to support projects that help individual firms or groups of firms to:

- Plan for future expansion,
- Identify and develop different markets,
- Research and develop innovative products and services,
- Improve process design,
- Adopt new technology,
- Develop external business networks, supply chains, joint ventures and industry clusters,
- Be more environmentally effective, and
- Improve overall sectoral performance.

Assistance is only available to fund new activities/projects and is not open to business with a focus on the retail, wholesale, accommodation, hospitality or property development sectors.

The Scheme is a competitive program and applicants must have a demonstrated level of business success; the capacity to implement and sustain development projects; and be able to match funding on a dollar-for-dollar basis. (www.sd.qld.gov.au/dsdweb/docs-bin/publications/qids.pdf)

South Australia

Centre for Innovation, Business and Manufacturing (CIBM)

The centre was set up by the former Department of Business Manufacturing and Trade to provide businesses with information and specialist advice to assist them to innovate and grow. CIBM regarded innovation as ‘the most important tool in the never-ending quest to stay ahead of the future. Indeed, we’re convinced it’s the critical survival tool, the only solution if we want to effectively engage with the world’ (www.cibm.com.au).

The services offered by CIBM have now been incorporated into the activities of the Department of Trade and Economic Development, whose *Innovation Team* ‘helps small companies to grow rapidly and increase their exports of products and services, ensures companies use their resources efficiently, works to implement relevant technologies and business processes across industry, and provides mentoring for small companies or individuals with an idea for a new product or service’.
(www.cibm.com.au/growing/index.shtml#innovation)

Industry clusters

The government provides support for *The SA Business Vision 2010* (SABV 2010) project first created in 1996 by the South Australian Employers’ Chamber of Commerce and Industry Inc. One of the projects established under the SABV 2010 is the development of industry clusters.

The cluster model used in South Australia follows one developed in the USA in Silicon Valley in which industry clusters are ‘groups of competing, collaborating and interdependent businesses working in or servicing a common industry in a geographic region, that draw on shared infrastructure and on an available pool of skilled workers.’ The clusters aim to drive growth through innovation, promoting and enabling specialisation and critical mass within a region. They aim also to attract new investment, expand market opportunities and promote the start-up of new companies. As suppliers to the cluster are attracted to the region to be close to their customers, pools of talent and skills are expected to develop to meet the needs of cluster growth, as are new partnerships between business, Government and the community to address infrastructure needs identified by the industry.

(www.sabv2010.com.au/sabv/site/projects/projects.html?l1=20&l2=23&p_id=7)

Clusters have been developed in the Defence, Spatial, Water, Sports & Recreation, International Tourism, Environment, Conventions, Food, Healthy Ageing, Upper Spencer Gulf and the Arts industries. A new Cluster is currently being developed in the area of Flinders Ranges Tourism. Several VET providers have developed, or are developing, close links with clusters for the delivery of new and specialised training. A case for strengthened VET involvement is becoming clearer as the clusters mature and skill gaps and needs become more visible.

Innovation Centre

Development of the Innovation Centre involved a two-year partnership (2001-2003) between the government and the Microsoft Corporation which had five key objectives:

- To promote the Information Economy through innovation and the best practice use and development of the Microsoft software available to Government.
- To achieve maximum business value for Government and local industry partners.
- To encourage the accelerated development and deployment of best practice business applications.
- To support effective business to business and business to consumer information exchange.
- To create virtual information exchange networks and research to the advantage of the Government and South Australia generally.

The Centre undertook projects that have led to the introduction of new tools and processes in a number of different public sector agencies and the development of some new business opportunities. (www.ic.sa.gov.au)

Western Australia

WA Innovation Support Scheme

This competitive scheme aims to encourage companies to undertake research and development and to offset the risks in bringing new ideas to a commercial, marketable stage. It provides grants of between \$20,000 and \$50,000 on a matching dollar for dollar

basis to support research and development of innovative products and processes with commercial merit.

Building Future Prosperity: Creating Jobs and Wealth through Industry Development

This government policy aims to 'broaden the State's economic base to grow new, sustainable and highly innovative industries'. Two initiatives announced in early 2004 are:

Innovation Capability Development Scheme

Funding of \$500,000 has been made available over three years to assist local companies to prepare submissions for private sector and federal funding programs.

Innovation Centre

An Innovation Centre is being set up as an incubator for emerging firms and to provide a 'focal point' for innovation in the state. A web site of resources provides information about business development and commercialisation (www.innovation.wa.gov.au/Innovation/Innovation_Guide)

(www.innovation.wa.gov.au)

2. Decentralised Approach

New South Wales

The Australian Technology Showcase

This program was established by the NSW Government in 1997 and became a national program in 2001. It aims to foster Australian innovation and promote it locally and internationally. More than 350 NSW companies are now in the ATS program and it is reported that they have achieved more than \$500 million in additional sales, exports and investments. (www.ats.business.gov.au)

The ATS sponsors awards and runs a *Technology Demonstration program*, which provides competitive grants to support collaboration between NSW-based small to medium size technology companies (SMEs) and government and the private sector to trial or demonstrate proven technologies within the Australian Technology Showcase (ATS) program. Grants of up to \$35,000 are available for up to 60 percent of the total costs of the project.

Australian Technology Park

The government provides support for this scientific, research and development precinct in Sydney. The Park aims to support the growth and commercialisation of Australian technology businesses by providing an environment for information exchange and networking. More than 100 tenants range from micro start-ups to multinational organisations, State and Federal Government organisations. (www.atp.com.au).

The VET sector is represented on the Park by the TAFENSW Industry Partnership Centre, which assists companies located at the ATP to expand their business by brokering relationships with TAFE Institutes for the provision of training⁵ (www.tafensw.edu.au/ipc/what/summary.htm).

Tasmania

Tasmanian Innovations Program

Innovation Grants program: provides grants on a two for one basis to a maximum of \$150,000 to assist small and medium-sized businesses with commercialisation of their innovative products and services by contributing to the direct costs of production or service development. Up to \$20,000 is also available, on a three for one basis, to employ a mentor to guide the applicant on development, business planning or marketing of the new product, service or process (www.development.tas.gov.au/innovprogs.htm)

The i-cubed network: A small program which facilitates the interaction of innovators, investors and intermediaries through seminars and evening functions.

Innovation Centre

Established by the Department of Economic Development the centre aims to support the commercialisation of intellectual property. It has a focus on businesses and individuals with innovative products, processes and services that have the potential to generate employment, investment and exports. In partnership with the Department of Education the Innovation Centre has established *Enterprise Learning Centres* to teach innovation and entrepreneurship skills.

Northern Territory

Innovation and Knowledge Economy Unit

This unit within the Office of Territory Development focuses on the development of knowledge and expertise in Desert Knowledge and Tropical Knowledge. It supports the Desert Knowledge Co-operative Research Centre and other Desert Knowledge initiatives in Central Australia. The government aims to capture economic development opportunities arising from research and development in these areas conducted by education and research institutions, businesses and entrepreneurs. (www.otd.nt.gov.au/dcm/otd/innovation)

⁵ This centre is discussed further in the following section on VET initiatives.

Australian Capital Territory

Knowledge Fund

The fund provides grants of up to \$200,000 on a matching fund basis to assist businesses to commercialise knowledge-based goods and services through:

- Protection of intellectual property.
- Development and implementation of marketing plans.
- Contract employment of key commercialisation or technical staff.
- Contracts with other ACT-based research institutions for R&D or consultancy services relating to product development or commercialisation.
- Costs related to developing a marketable product.
- The purchase of specialised equipment or facilities to produce or develop marketable products or services.

(www.business.act.gov.au/services/startingyourbusiness/knowledgefund.html)

Commercialisation Fund

This \$10 million fund is used to attract investment capital to the ACT with the primary objective of turning ‘Canberra’s intellectual assets into businesses, exports and jobs’. The operating guidelines for the Fund were being developed at the time of writing. The Fund was expected to operate from 2004/05.

(www.cmd.act.gov.au/canberraplan/docs/02_Commercialisation_fund.doc)

5. VET initiatives

This section provides information about state and territory initiatives which aim to support VET responses to innovation.

1. Whole of government approach

Victoria

The Victorian government’s innovation statement of 2002 noted a need for higher levels of investment in skills development and new technologies. In describing the role of the Victorian government in ‘boosting innovation across the economy’ the statement indicated that this would include ‘supporting the generation of ideas and knowledge and the development of a skilled and creative workforce through investment in education and training and through the support of public sector research bodies’.

The statement further indicated that the government’s *Innovation Economy Policy* would include among its objectives ‘building an educated and highly skilled workforce – supported by a high quality and flexible education and training system’.

In June 2002 the Office of Training and Tertiary Education released a Ministerial statement, *Knowledge and Skills for the Innovation Economy*⁶. This aimed to support the government's broader agenda to develop Victoria as an innovation economy by:

- Reinvigorating TAFE so that Victoria has a highly skilled workforce to provide innovative and relevant training for firms and for students preparing for active citizenship in the innovation economy.
- Developing new VET products to meet the generic skill needs of individuals and firms, to meet new and emerging skill needs, to value local customised responses and to improve learning pathways.
- Implementing a coordinated development of lifelong learning by linking VET to ACE, schools and universities.

Among the initiatives announced in the statement was the establishment of funding for TAFE institutes to trial new initiatives in innovation, emerging skills and industries from existing resources.

Innovation Fund

An *Innovation Fund* was established for the period 2003-2005 with the purpose of encouraging TAFE institutions 'to provide new forms of vocational education and training (VET) that move beyond standard products and take a new approach to the design, development and delivery of products and services'.
(www.ette.vic.gov.au/innovation/pdf/guidelines.pdf.)

The programs and products developed and supported by the Fund were expected to be innovative and to encourage firms, individuals and communities to participate in the Innovation Economy, such as:

- Local solutions tailored to meet the specific needs of firms, small to medium sized enterprises and community groups, including customised products, flexibly delivered programs, e-solutions and other innovations
- New skill requirements in existing and newly emerging industries
- New alliances/partnerships between institutions and firms and between institutions and other registered training organisations.

In October 2002, a first round of 44 initiatives across 17 TAFE institutions were endorsed by OTTE for implementation in 2003. They included 13 aimed at 'new and emerging skills to position Victoria globally'. Initiatives included some three year programs with research and development components.

Guidelines for the 2004 round of funding indicated three priority areas:

- *Innovative delivery models*, including the establishment of 'creative partnerships' and 'research and development of new programs, products and resources'.

⁶ Subsequently the Minister issued a similar statement regarding higher education.

- *Innovative approaches to skill development in emerging skills and industries*, to facilitate the development and implementation of innovative training solutions for technology-driven change, including new and emerging industries.
- *Leveraged delivery*, through alliances between TAFE Institutes, TAFE Divisions within Universities, firms, industry bodies and/or other providers (schools, ACE, higher education) and other non-government community organisations.

TAFE institutions were not expected to report innovation fund initiatives against student contact hours. Guidelines for the 2004 funding round encouraged TAFE institutions ‘to trial and evaluate the use of alternative methods of measuring accountability’. For instance, they suggested that ‘accountability for specific innovation project objectives may be more accurately reflected in measures of client satisfaction and achievement rather than in the more general measure of the delivery of student contact hours’.

Specialist VET Centres

The Ministerial statement announced the provision of \$5 million in seed funding for the development of *Specialist VET Centres*, based on a view that the ‘TAFE system is not homogenous’ and that each Institute is ‘uniquely positioned to engage with the innovation economy and community and educational needs in their own way’. The statement indicated that Specialist Centres would be expected to lead the development of ‘supporting provider networks’ to share their expertise across the system. They would also:

- Create a strong focus for closer work with industry and/or communities
- Encourage diversification of training products and services
- Provide added value to existing training programs and services
- Increase the confidence of employers in the excellence of TAFE provision.

Eligibility to bid for the funding was opened to TAFE Institutes, Registered Training Organisations and Adult Education Institutes.

Fifteen centres were established in 2003 with seed funding to enable them to recruit support staff and demonstrate their capabilities. They were expected to attract matching support from industry and to work toward self-funding. The centres were also given priority in the allocation of equipment funding to enable them to renew and expand existing facilities and resources. Only sites that had an existing capability were chosen for development into specialist centres.

Some centres focused on particular industries or industry sectors, eg:

- Specialist Centre for Primary Industry
- Centre for Transport, Distribution and Logistics.
- Specialist Centre for Motor Sports Training
- Specialist Centre in Hospitality, Tourism and Culinary Arts
- Victorian Meat Processing Centre

Some others worked across industries, eg

- National Centre for Sustainability
- Centre for Environmental Technology

One worked with a particular type of enterprise:

- SME Specialisation Centre

At seminars conducted toward the end of 2003 the centres presented on their work. Among the outcomes that they demonstrated were:

- The identification of new and emerging industry areas and associated training needs.
- The development of new resources for teaching and learning.
- The development of new competencies.
- The identification/revision of existing competencies appropriate to the field.
- The creation of new programs and/or the extension of existing programs including short courses and graduate certificates, publicly-funded and fee-for-service programs.
- The building of substantial links/networks with industries, communities and other providers, especially within regions.

Departmental officers indicated that it was expected that some form of recognition of the centres would continue beyond their initial period of seed funding.

New and Emerging Skills Unit

The statement also announced the establishment of a *New and Emerging Skills* unit within the Office of Training and Tertiary Education to work with TAFE Institutes and to research emerging skill areas.

The unit was also given responsibility for the development and implementation of the specialist VET Centres.

Local Learning and Employment Networks

LLENS were introduced by the Victorian government in response to the report of the 2000 *Ministerial Review of Post Compulsory Education and Training Pathways in Victoria* (the Kirby Report). This highlighted the importance of partnerships between government and communities to develop local responses to the diverse needs of communities and recommended the establishment of networks of education and training providers, industry and other agencies. These networks were expected to create a cooperative approach to planning at the local level and to take responsibility for community renewal and strengthening, minimising duplication and wasteful competition and acknowledging community and industry shared responsibility and ownership of post compulsory education and training.

(www.det.vic.gov.au/postcomp/policy/default.htm#kirept).

LLENs are based largely on local government boundaries and comprise local education and training providers, employers, councils and other interested people. They work to:

- Identify gaps in the provision of education and training locally.
- Plan educational programs for young people.
- Developing pathways for local young people, especially those at risk of dropping out.
- Monitor pathways and outcomes.
- Advise the new Victorian Learning and Employment Skills Commission (VLESC) on the needs of young people in their area.

The LLENS also provide advice and information to government about post compulsory education, training and employment in Victoria in partnership with the *Victorian Learning and Employment Skills Commission* (VLESC). (www.llen.vic.gov.au/)

Queensland

The government's ambitious goal of creating the 'smart state' is a focus of many recent policies and plans for education and training in the state.

Skilling Queensland: a strategy for VET 2001-2004

This VET strategy aimed to build 'a highly skilled and adaptable workforce for the *Smart State*' (p. 15). More specifically, its second objective '(To) *embrace the information and biotechnology age*' acknowledged the need to address innovation issues. Related to these goals, the strategy indicated a need 'to develop and maintain the skills to work effectively with new technologies' in all industries and a further need to equip 'Queenslanders with the knowledge and skills they need to support emerging industries and apply technology for better business and community opportunities' (p 7).

The strategy listed a number of approaches to be adopted to increase awareness of the training needs associated with innovation:

- identify and advise on vocational education and training needs and opportunities in the information and communications technology industries
- identify and advise on vocational education and training needs and opportunities across other technology-enabled industries.
- raise awareness of the new skills needed in the information and biotechnology age.

It particularly identified a number of new and priority technology-based industries where additional effort was required to build VET capabilities to meet training needs:

- increase training activity in (and develop capacity for the system to shift training activity to) identified emerging industries including information technology, telecommunications, biotechnology, aquaculture, aviation, wine, and pharmaceuticals.

- support the capacity of training providers to customise information and communications technology qualifications and deliver high quality training outcomes for industry.
- improve the quality of planning, equitable provision and rapid response to technology driven skill needs.
- support TAFE Queensland and other registered training organisations in building a sustainable technology capability.

It indicated that the new approaches it outlined were to be implemented through existing policy and planning frameworks and networks such as:

- Training system funding and planning processes, including the Queensland Training Priorities document and Annual Vocational Education and Training Plan informed by the industry training advisory bodies
- Planning and resourcing agreements with TAFE Queensland Institutes and agricultural colleges, and contracts with other registered training organisations including group training organisations.

(www.trainandemploy.qld.gov.au/client/resources/about/research_publications/strategy_policy/pdf/vetstrategy.pdf)

White paper on education and training reforms

Released in November 2002 the government white paper *Queensland the Smart State – Education and Training Reforms for the Future* noted that the ‘Smart State’ vision ‘means positioning Queensland to take its place among the best in the world’ and that this requires ‘encouraging innovation’. It also means ‘educating and skilling people so they can compete for and create jobs in emerging fields, and revitalise traditional industries’ (p 6).

The paper proposed education and training reforms for schools including education to work initiatives. (<http://education.qld.gov.au/etrf/>)

SmartVET

The role to be taken by Queensland’s VET system in achieving the state’s goal of a ‘smart state’ is set out in the document *SmartVET Skilling for the Smart State, Priority Training for Queensland’s Economic Growth 2004-2007*.

(www.trainandemploy.qld.gov.au/client/about/research_publications/strategic_policies/pdf/SmartVET.pdf)

The document describes a strategy to expand VET and align it more closely with the skills requirements of ‘key industries’ by ‘revolution (-ising) employment and training initiatives in the state’, with the aim of ensuring ‘that students and workers obtain skills to meet the evolving needs of industries that hold the key to sustained economic growth across the state’.

The strategy includes some specific initiatives:

Matching Smart Skills with Smart Jobs

The creation of an integrated training and employment service to increase employability among workers and to assist industries facing skills shortages to acquire suitable workers on demand.

Understanding the Skills Supply

The development of Skills Formation Strategies for selected major employment sectors and regional locations, such as mining, building and construction, pharmaceutical and the Western Downs.

Producing the Skills that Smart Industries Need

An increase in funding to enable the state's User Choice program to expand.

TAFE Institutes and Agricultural Colleges - Smart Service Delivery Targeting Smart State Industries

The targetting of existing funding for training to 'smart industry sectors' and new funding to support 'new priority training places and services in key growth locations'.

Supporting training in priority industries

The document outlining how education and training funds are to be allocated, *Smart Investment Queensland Training and Employment Priorities for 2003-2004*, specifically notes the need for a skilled workforce in order for the state to 'realise its potential to become a leader in emerging industries and technologies' (p 5). It also indicates innovation as a factor shaping many industries: Biotechnology, Aviation, Energy, Environment, Information and Communications Technologies and Transport and Logistics.

The document outlines some specific supports for training for priority industries:

- The government's intention to 'grow traineeships' in the Biotechnology and Aquaculture industries.
- The provision of additional funding for the Aviation industry to support 'industry-specific skill centre infrastructure' for Cairns Aviation Skills Centre.

In introducing the document, the Minister for Employment, Training and Youth, indicates that both public and private training providers needed 'to stay one step ahead of the changing demands on Queensland's vocational education and training system, continually refining their training products and services, their workforce capability and their training infrastructure'.

(www.trainandemploy.qld.gov.au/client/about/research_publications/strategic_policies)

South Australia

The State Strategic Plan recognised that 'how well we compete internationally depends on how well we educate and train South Australians'. It also demonstrated awareness that

innovation may face opposition where it discomforts, and hinted at the approach the government would take to counter this:

Strong economies have grown from investing in people and communities. When people know that they will share in the benefits, they will support rapid change and stronger productivity growth. (www.stateplan.sa.gov.au/summary.php)

The terms of reference for the *Information Economy Advisory Board* contain similar indications of the importance of skills:

Skills and Awareness – ensuring that South Australians have the necessary skills and understanding to engage productively with the information economy (www.innovation.sa.gov.au/sti/pages/IEAB)

Skills inquiry

In 2002, the government announced an extensive inquiry into:

- The nature, extent and pattern of skill needs and shortages in South Australia and practical strategies to address difficulties.
- Better integration of skills formation with industry, economic and social development policy and programs.
- The capacity of existing education and training systems to build a highly skilled workforce capable of meeting new skill needs and keeping pace with rapid global and technological change and how they could respond better to predicted local workforce demands.
- The contribution of enterprises, individuals and the Government to the costs of training and ways to encourage greater employer investment in workforce skills.
- Ways in which the State's education and skills base could be used to attract new industries to South Australia.
- Strategies for ensuring that those who are disadvantaged have access to the economic and social benefits of skill development.

The inquiry, conducted by representatives of business and education and training, sought the views of industry, unions, educators, communities and business in Adelaide and regional South Australia. Its final report, published in May 2003 indicated that *workforce development* was 'the over-arching concept that would underpin the Government's strategy to lift the quantity and quality of skills in the South Australian labour market to achieve greater prosperity for all' (p7) and that this comprised:

...those activities which increase the capacity of individuals to participate effectively in the workforce throughout their whole working life and which increase the capacity of firms to adopt high-performance work practices that support their employees to develop the full range of their potential skills and value
(www.saskillsinquiry.sa.gov.au/files/links/Skills_Report2.pdf.)

However, the inquiry also cautioned that while 'skill formation strategies are important', they cannot solve all problems:

Skill formation is no substitute for full employment and income distribution policies. Skills formation cannot overcome structural weaknesses in South Australia's economy, solve unemployment, create jobs, address the social consequences of unemployment for individuals and communities or shift poorly performing firms to a higher level.

(www.saskillsinquiry.sa.gov.au/files/links/Skills_Report2.pdf)

The report suggested that skills need to be viewed in the context of both work and community life and that skills' formation policy needs to consider questions of state development, industry policy, innovation policy, employment policy and social policy. It further recommended that the government focus on three matters:

- Increasing the demand for higher order skill from large and small companies and increasing the demand for skill from individuals.
- Improving the alignment and adaptability of the supply of training and ensuring development opportunities are available to all South Australians, especially those most disadvantaged in the workforce.
- Providing a whole-of-government framework to promote the development of a skilled workforce to support innovative firms and strong economies and labour markets throughout South Australia.

Reforms responding to the skills inquiry

Following the Skills Inquiry the SA Minister for Employment, Training and Further Education, Science and Information Economy and Tourism released a statement in response to its recommendations (*New Times, New Ways, New Skills*, July 2003) (www.tafe.sa.gov.au/information/files/links/n_1.pdf) . This announced initiatives including:

- The establishment of a Training and Skills Commission (September 2003) with responsibility for development of the *Workforce Development Strategy* in conjunction with the state's Economic Development Board, Social Inclusion Board, industry, businesses, unions and community groups. The strategy would:
 - Identify likely skill shortages and bottlenecks and plan accordingly.
 - Provide access to training for specific groups who have been disadvantaged or under-represented in the labour market.
 - Develop strong regional approaches to ensure all South Australians have access to employment and skill development.
 - Foster innovation.
 - Capitalise on South Australia's strengths in research by promoting commercialization.
 - Encourage and promote lifelong learning, increasing workforce retention, productivity and social inclusion.
 - Develop and strengthen partnerships between government, industry and individuals and encourage shared responsibility for skill formation.
 - A new TAFE SA Board with responsibility for a 'comprehensive review of all TAFE programs to ensure they are meeting the changing needs of learners,

enterprises and industries’ and the implementation of ‘a modern program management system’ to ‘identify priorities for course delivery and explore opportunities for specialisation’.

- A *Workforce Development Fund* to support initiatives to develop higher level skills. Jointly managed by the Department of Further Education, Employment, Science and Technology and the Department for Business, Manufacturing and Trade it provides funding for enterprise specific training and partnerships with VET providers to develop and provide ‘value-added training programs’.

The Office of Employment and The Office of Vocational Education and Training have now amalgamated into a new *Employment and Skills Formation Directorate*, within the Department of Further Education, Employment, Science and Technology.

Western Australia

A *Science and Technology Innovation Strategy* for VET was established in 1999 with the objective of developing a culture within the VET sector which:

- Contributes to the state’s national and international competitiveness through science and technology innovation and skills development.
- Promotes VET sector collaboration with industry on relevant science and technology projects.
- Results in the VET sector being viewed as a ‘high tech’ education and training choice.

Development of the strategy was based on a view that:

In recent years the rapid growth in development and innovation has placed increasing demands on the VET sector to keep pace with the needs of (these) specialised fields. This has required developing new and innovative approaches to identifying and delivering training needs. (www.training.wa.gov.au/inside-department/content-organisation-science-tech.asp)

The strategy included initiatives for the development of entry level training, life long learning, strategic linkages and professional and career development. A ‘key element’ was the establishment of a *Science and Technology Innovation Fund* providing annual funding of up to \$1 million in grants for training providers to participate in collaborative science and technology projects with industry, universities, government and other bodies that would have training outcomes.

A total of 29 projects were funded to the final round in 2003, including:

- A project to train workers to design, engineer and repair high-tech equipment such as high-end circuit boards and components used in mobile phones, computers, digital television, video and sound equipment, and defence force applications.
- A project to develop a unit to test the point of failure of high pressure hydraulic hoses and fittings and formal training and certification for hose doctors.

- A project to identify best practices, performance standards and procedures for CNG fuel systems including a pilot program to train employees to install, maintain and refuel CNG-powered vehicles and convert diesel-powered engines.(www.training.wa.gov.au/initiatives-events/content-sctech-home.asp)

While the final round of projects was funded in 2003, the legacy of this initiative can perhaps be seen in one of the state’s training priorities for 2004-2006, which seeks to ‘Enable training providers and brokers to partner with industry to drive innovation’. (www.training.wa.gov.au/sub-sites/stsweb/statetrainingprofile/priorities.htm)

3. Decentralised approach

New South Wales

The Board of VET⁷’s *Strategic Plan for VET 2002-2004* has ‘Skills for the new economy’ as one of its three areas of focus⁸. The Plan notes a need to respond to emerging industries and the new economy, and indicates the extent of the shift that this will entail when it states that the ‘current focus of VET’ is ‘on the low skill end of the job market and meeting the current skill needs of industry’.

<i>Initiatives</i>	<i>Outcomes</i>
Partner with innovative, high performance enterprises to develop and deliver programs integrated with new products and services.	Innovative training products and services are developed and new skill needs are met.
Make available training in foundation computer skills for the people who need it in NSW.	The computer literacy of the NSW population is improved and enabling skills for the new economy developed.
Assist traditional industries to develop the capacity to adapt to change and to innovate.	Productivity improved and skill needs of workers met.
Build strategic partnerships with professional associations, other education sectors and businesses in order to increase skills development in: <ul style="list-style-type: none"> • emerging industry areas • growth business service areas • high skill areas where opportunities for career development training exist. 	Training products and services are available and training needs are met. Student and employer satisfaction increased. Higher completion rates in courses and increased qualifications attained in these industry areas.
Expand diploma level traineeships.	Expansion in the numbers and range of diploma level traineeships. Higher completion rates in these traineeships.
Increase retraining opportunities for people in those middle-skill level occupations where employment is declining.	Improved employment outcomes and better jobs.

Source: (www.bvet.nsw.gov.au/pdf/strategplan.pdf)

However the plan suggests that change should proceed cautiously, as VET must balance the need to anticipate and respond to new and emerging areas of work with the need to provide skilled workers for traditional industries.

⁷ The Board is responsible for overseeing policy and planning initiatives and fostering partnerships between ‘key stakeholders’ in the NSW training system.

⁸ The others are Skills for regions and communities; and Skills for participation

The strategic plan outlines a range of initiatives to meet the Board's objective of developing skills for the new economy, with anticipated outcomes, as indicated above.

Skills ecosystems project

This project is a result of research commissioned by the Board into the changing nature of work and the link between skills development policy and work. It aims to develop and implement strategies enabling VET providers to foster and support regional and industry 'skill ecosystems'. The research report, *Beyond Flexibility: Skills and Work in the Future*, highlighted a need to broaden skills policy to reflect and respond to emerging work trends and proposed the skill ecosystem concept to explain the emerging relationship between skills and work. Skill ecosystems are defined as 'interdependent clusters of skills within regions and/or industries that are shaped by the nature of firms, the nature of products and markets, and key regulatory and policy settings'.

The project involves four initiatives:

- Three national demonstration projects.
- A high-level peer network to identify, develop and disseminate advice about current and emerging issues and challenges.
- An online forum.
- Support for state and territory innovation plans.
(www.skillecosystem.net)

TAFE NSW

Among its strategic directions for 2002-4 TAFE NSW intends to 'develop and enhance TAFE NSW's capabilities to foresee and shape future training needs'. Success will be measured by 'changing the TAFE business profile to better reflect economic and social needs'. (www.det.nsw.edu.au/strat_direction/stratdir02_04/tafe.htm)

The Industry Partnership Centre

TAFE NSW established the Centre at the Australian Technology Park (ATP) to broker relationships between itself and emerging technology companies. The Centre's website indicated that it:

- initiates the investigation of the feasibility of TAFE NSW developing and delivering courses in such areas as photonics, biometrics, biotechnology, nanotechnology and high performance computing, as well as areas such as salinity and sustainability. This work is undertaken in close consultation with the appropriate stakeholders from TAFE NSW and the relevant technology / industry area.
- provides ATP companies and visitors with information about TAFE courses.
- helps TAFE NSW build sustainable partnerships with ATP companies. It works individually with companies at ATP to gain up-to-date information on industry developments and to then use that information to help form long-term, multi-

- faceted partnerships between those companies and TAFE NSW, to their mutual benefit.
- assists ATP companies with the recruitment of staff who have been trained by TAFE NSW. As well, the Centre can arrange opportunities for companies to take on students from a range of courses for a structured work placement.
- plays an important role in researching and facilitating technology transfer into TAFE NSW programs, to ensure that TAFE teachers and students are equipped to address technological changes in industry.

Since its inception the Centre has completed many projects, most of which have led to the development of new training and all of which have developed understandings within the VET system of the nature and implications of innovation:

- Establishing a strong alliance between the Australian Photonics Cooperative Research Centre (CRC) and Southern Sydney Institute that led to the development of three courses in Photonics at Certificate II, Diploma and Advanced Diploma levels
- Developing and implementing customised training in a series of entrepreneurship skills development workshops based on skills identified by ATP companies.
- Working with the Australian School of Engineering Innovation and TAFE NSW – Sydney Institute to develop a TAFE NSW Graduate Certificate in Innovation Management
- Supporting the design and delivery of the a course to raise awareness of new manufacturing technologies and applications among TAFE NSW engineering teachers.
- Advocating successfully for TAFE NSW representation on the Board of the Australian Centre for Advanced Computing and Communications (AC3) that led to greater awareness of the technology of advanced computing, its use in data management and security, graphics and online learning
- Developing a web-based ‘Plain English Guide to the National and NSW VET systems’ for use by companies and organisations at ATP
- Initiating development of VET courses in salinity, to be piloted in the Western Sydney region.
(www.tafensw.edu.au/ipc)

Tasmania

The Office of Post-Compulsory Education and Training implemented an innovation strategy for 2002-2003 targeting industry areas with potential for growth and development. including the implementation of industry/VET partnerships to meet the skills needs of emerging industry areas, or new occupations in emerging industry areas.

The state’s VET Plan for 2004 includes an innovation strategy developed in consultation with the department of economic development. The strategy focuses on areas in which new training products will be introduced to meet skill needs arising from new

technologies and work practices, and new occupations. The strategy has three components:

1. Priorisation of funding for new apprenticeships at Cert Levels II and III in particular areas.
2. Funding of new apprenticeships at Cert IV level where need demonstrated for higher level skills.
3. Specialised programs including industry/VET partnerships to meet the skills needs of emerging industry areas or new occupations in emerging industry areas, and to provide increased management, technological and financial skills to underpin development of innovation practice across industry, eg: energy, telecommunications, agriculture and aquaculture, food processing, conservation and land management, tourism and hospitality, business and finance.

Northern Territory

The Department of Employment Education and Training *Workforce Employment and Training Strategy 2003-2005* includes attention to ‘Industry Change and Growth’. The strategy recognizes that industry undergoes sometimes rapid change, eg through the adoption of new technology or changes to licensing requirements or legislation. This might lead to increased demand for new and higher level skills. In addition, the strategy notes that a growing industry may also face difficulty in attracting skilled workers.

The strategy indicates that the Territory Government will:

- work with industry to find solutions that will help the industry adapt
- assist existing employees to upgrade their skills or train to change occupations where this might become necessary
- embrace innovative and responsive training options.

(www.deet.nt.gov.au/employment/jobs_plan_nt/workforce_strategy.pdf)

Australian Capital Territory

Strategy	Performance Measure
<ul style="list-style-type: none"> ▪ Undertake research into the vocational education and training needs of client and supplier groups. ▪ Develop long-range planning cycles which take account of industry, business, government and community sector trends. ▪ Support and facilitate the establishment of collaborative partnerships/strategic alliances between industry, providers and the community, and cross-sectoral alliances between higher education and RTOs (including schools) to enhance vocational education and training outcomes for clients. ▪ Encourage RTOs to improve their online training delivery. ▪ Improve arrangements to recognise existing skills within the community. 	<ul style="list-style-type: none"> ▪ VET demand reported in ACT VET Half-Yearly Outlook ▪ Client satisfaction surveys ▪ Emerging trends included in ACT VET Planning Framework and Half-Yearly Outlook ▪ Training purchased in line with Half-Yearly Outlook ▪ Number and range of alliance types ▪ Number and range of improvement initiatives ▪ Number and range of ▪ Recognition of Current Competency arrangements

Source: (www.decs.act.gov.au/publicat/VET/VETStratPlan.pdf)

The 2002-2004 VET plan for the ACT has ‘supporting innovation’ as the second of its ‘key focus areas’. The report sets out strategies to work towards this goal and performance measures to assess progress, as indicated above.

The ACT Council on Adult and Community Education set up a Canberra Learning Community Committee (CLCC) in February 2003. Among the working groups established by the Committee is the Innovations Group, which has been given the task of researching ‘innovative partnerships and solutions for learning opportunities’.

The CLCC is working to link its activities to the government’s three major strategic plans: Spatial Plan, Economic Plan and Social Plan. (www.lcc.edu.au/lcc/page93.html)

Discussion and Conclusions

Across the states and territories there is an extensive – and growing – range of government policies and programs that focus on innovation. This project was not able to document all of these initiatives but has noted many seeking to promote and assist innovation in industries and enterprises and a smaller number aiming to assist and support VET systems to respond to innovation - and especially to the changes it makes to the types of skills required for work.

During this project many new innovation initiatives were announced – so much so that it was difficult to keep up-to-date with developments, even within a relatively short space of time. The state of relevant policy and program development is thus best described as ‘fluid’. However, some initiatives have been in operation for some time, particularly those supporting innovation in industry or enterprises.

Innovation-related initiatives that focus on VET tend to be more diverse than those directed at industries and enterprises. The diversity most probably reflects the ideas of VET policy makers and personnel in different states and territories as they respond to local conditions and precedents. The establishment of the TAFE industry partnership centre in NSW for instance, builds on that state’s strong central TAFE development focus, while Victoria’s support for specialist centres recognises the individual strengths that VET providers in that state have developed over many years of autonomy.

More VET-related initiatives also have a limited lifespan. For example, Victoria’s specialist centres program offered one year’s seed funding and Western Australia’s science and technology innovation strategy funded projects over the 4 years from 1999-2003. The limits to these initiatives perhaps indicate that policy-makers are taking a ‘trial and error’ approach to the challenges posed by innovation, it might reflect funding allocation limitations, but could also suggest that policy makers may believe VET systems and providers need only a ‘kick start’ to assist them to respond effectively to innovation. With this initial start they will be able to develop the capacity to sustain the required effort on their own.

This latter view is supported by the fact that during the project it became clear that many individual VET providers were already taking action in response to innovation. Though these types of initiatives were not specifically sought or explored in this study, discussions with providers in two states revealed that they were aware of a need to keep in touch with, and respond to, changes in industries represented among their current clients. They were also looking to the future and thus working to develop relationships with new industries, clusters of industries, or industry sub-sectors. Unfortunately, these providers sometimes expressed a view that their work was not always adequately recognised or supported by the state or territory training authority and occasionally their efforts worked against their interests, for instance in creating new demands on their financial resources and requiring a substantial share of their funded staff time.

Innovation policy

Overall, the states and territories appear to be adopting either a ‘whole of government approach’ or a more ‘decentralised’ approach to the challenges of innovation.

Governments taking the ‘whole of government’ approach are articulating a central set of objectives and implementing an overall strategy to meet them. Their departments and agencies are developing plans and strategies that align with the central vision and implementing policies and programs that will contribute to the achievement of the overall objectives. Close links are apparent between industry policy and VET policy.

The central vision is often framed boldly and is ambitious in the outcomes it hopes to achieve. Queensland’s ‘smart state’ strategy seeks to position the state at the ‘forefront of the knowledge-based economy’, while South Australia’s Science, Technology and Innovation Vision – *STI¹⁰* aims to expand the state’s economy and international competitiveness, protect its natural resources and enhance community prosperity’. Victoria aims to develop an internationally competitive ‘innovation economy’ while in Western Australia the *Innovate WA* strategy aims to, among other things, to generate more jobs and expand the export potential of the state.

Where governments do not have a central articulated innovation plan or strategy they take a more ‘decentralised approach’, with departments and agencies developing their own objectives and initiatives to meet the challenges of innovation. This is the case in NSW and Tasmania, the ACT and the Northern Territory. Though a lack of co-ordination and integration might be expected under this approach, it is not necessarily so. The different objectives and plans of the various government departments and agencies are all built on the same foundation – government policy - and thus reflect similar views and aspirations, though within different contexts. Also, some department and agencies appear to be mindful of what others are doing and so there are some links between initiatives.

The size of the state or territory does not appear to influence the approach it adopts. Two of the most populated states, Victoria and Queensland, have adopted a ‘whole of government approach’ but so also have two states with much smaller populations, South Australia and Western Australia. While a decentralised approach is apparent in the two small territories, it is also evident in the most heavily populated state, New South Wales.

If the ‘decentralised approach’ is considered as the ‘default’ position, the factors driving some states towards a more pro-active ‘whole of government’ approach become a little clearer. In the past decade Victoria, Queensland, South Australia and Western Australia have not consistently enjoyed the stable and secure economic success they seek. The innovation strategies that they have each adopted reflect this and their desire to attain and maintain greater economic and social prosperity in the future. On the other hand, its size and industrial strength has assured greater economic prosperity for New South Wales and thus it has not been influenced to the same extent by the same driving forces.

Regardless of which approach they are adopting, all state and territory governments appear to be working to identify the challenges of innovation and to develop and implement strategies and initiatives to meet them. Both approaches are supporting a number of initiatives, many different kinds of initiatives, and initiatives by a variety of government departments and agencies. On the evidence of those noted in this report, and others that could not be included, it would be unfair to conclude that a ‘whole of government approach’ necessarily means that a larger number, or a broader range, of initiatives will be implemented. However, overall objectives tend to be more strongly and clearly stated – and thus provide a stronger focus for concerted and integrated effort – where there is a ‘whole of government’ approach.

When they introduce innovation initiatives the language that state and territory governments use tends to be bold and optimistic. It conveys an impression that they hold a positive view of innovation and its potential outcomes for social and economic prosperity. It indicates also that governments tend to regard support for innovation as an investment from which they expect substantial returns, rather than an additional burden. The positive nature of this language and the considerable funding required supporting the innovation initiatives outlined in this document together support a conclusion that governments are generally giving innovation and related issues a high priority. However, they do express an occasional note of cautiousness, point to a need to continue to meet the needs of the present while also preparing for the future.

Advisory bodies

Most states and territories have established a body to advise the government on innovation issues. The members of this organisation generally include representatives of government, industry and the science, technology and research communities, including universities. Formal representation of the VET sector on these bodies is unfortunately rare.

While the initiatives noted in this document indicate that governments are aware of the implications of innovation for skills – and of the need for appropriate VET responses, this lack of VET representation suggests that few have yet recognised the nature and extent of the current and potential VET contribution to innovation. Nor do they yet understand fully the need to build stronger links between their VET systems and innovators to accelerate the flow of information that will enable the development of new training to meet new skill needs as they arise.

Industry/enterprise initiatives

All states and territories have implemented initiatives to support and promote innovation in industry and enterprises. In some cases, states and territories focus their support on areas where the region has an existing advantage. For instance, the Northern Territory has chosen to centre its ‘innovation and knowledge economy’ efforts on *Desert Knowledge* and *Tropical Knowledge* – both of which are well-established within the region and reflect its particular geographical characteristics. In some others support is centred on areas where the government hopes to build an advantage in the state. For instance, Queensland is seeking to develop capabilities within the state particularly in the areas of Bio-Technology and Sustainable Energy. In still others, governments aim to promote innovation more generally and thus support is not limited to one, or to a small group, of industry sectors.

Across the states and territories two types of initiatives are common:

- Real or virtual centres where individuals and enterprises can seek advice, assistance and resources to help them with innovation, especially the commercialisation of an outcome of innovation or research such as a new product or process.
- Programs of competitive grants to support innovation and related activities.

A third type of initiative also appears in a number of states, though it is slightly less common than the two above:

- Places providing accommodation, facilities and business support for young innovative enterprises, eg ‘incubators’.

There are also initiatives that appear to have been implemented by few states and territories:

- *Industry clusters*: South Australia appears to be the only state to provide formal support for industry clusters, though there are indications that other states may be considering it.
- *Innovation audits*: Victoria appears to be the only state that so far has conducted detailed audits of the state’s ‘competitive position, future opportunities for growth and the sort of actions required to capture growth’.
- *Enterprise Learning Centres*: Tasmania’s Innovation Centre has established a centre in partnership with the Department of Education to teach innovation and entrepreneurship skills. Other innovation centres offer assistance and some training, but not through the same type of arrangement.

VET initiatives

In their education and training policy statements and VET plans, all the states and territories identify that innovation presents challenges for their VET systems. In NSW, for instance, the Board of VET’s strategic plan for 2002-4 notes a need to respond to emerging industries and the new economy. Similarly, in the ACT the 2002-2004 VET

plan has ‘supporting innovation’ as the second of its key focus areas. In Queensland the second objective of the VET strategy for 2002-2004 is to ‘embrace the information and biotechnology age’, equipping Queenslanders with the knowledge and skills to support emerging industries and the application of technologies.

The policies and plans indicate that VET systems will need to build capability if they are to meet these challenges. In Victoria, for instance, the Ministerial statement, *Knowledge and Skills for the Innovation Economy* talks about ‘re-invigorating’ the VET system . In NSW the Board of VET notes in its 2002-2004 VET plan a need to address the ‘current focus of VET on the low skill end of the job market and meeting the current skill needs of industry’.

The initiatives the states and territories are implementing to build this VET capability tend to have two features in common. The first is an emphasis on supporting partnerships, networks, or other arrangements that bring together representatives of VET (providers, planners) and of industries or enterprises to promote a better mutual understanding of the nature of changing skill needs and joint work to establish appropriate training provision as soon as it is needed. The second is the provision of support for VET providers to develop new resources, products and services to meet changing skill needs.

However, within this commonality, there are also many differences in initiatives, with states and territories choosing to support different types of collaborative arrangements and to vary the ways in which initiatives are funded and the levels of funding. This variety is apparent, for example, in a number of initiatives that do not appear to be directly duplicated in other states or territories:

- *Specialist VET Centres* (Victoria): supported with seed funding to develop expertise in some specific areas, to spread good practice among VET providers and to support regional development.
- *TAFE-Industry partnership centre* (NSW): established at the Australian Technology Park to develop relationships with new and emerging industries in order to identify their training needs and develop appropriate provision.
- *Science and Technology Innovation Fund* (Western Australia): funding for training providers to engage in collaborative science and technology projects with industry, universities, government and other bodies.

Assessing the initiatives

With few exceptions, most of the state and territory innovation initiatives identified in this project had either been in place for only a very short time, or were still in the course of being implemented. Thus though many appeared to be ‘bright ideas’ it was too early to judge how effective individual initiatives were, or to identify any particular features contributing to their success. However, it was possible to identify a number of general areas of strength as well as some areas where improvements are possible.

Four main general strengths were apparent:

1. The level of attention – and funding – the states and territories are giving to the challenges of innovation is substantial and growing. During the course of this project alone many new policies and programs were announced – and others foreshadowed. The initiatives require substantial levels of funding. Some additional funding is being allocated as well as some funding re-allocated from other areas. In addition, the initiatives are being framed to encourage funding from non-government sources, particularly industry.
2. The states and territories on the whole appear to be aware of a number of dimensions to the challenges of innovation and this is supporting the development of a diverse range of initiatives, across a number of government departments and agencies. The challenges of innovation are thus being tackled from a number of directions, rather than a single front. In addition, there is evidence of considerable co-ordination in some cases formal collaboration, between government departments and agencies in developing and implementing their initiatives.
3. In developing their initiatives the states and territories appear to be taking account of some of the features and characteristics of their region and the particular challenges and opportunities they offer, e.g. the Northern Territory's focus on 'desert knowledge'. In some cases also, initiatives are being implemented that have a more local focus i.e. that are tailored for the needs and opportunities within a particular sub-region of the state or territory (e.g. Queensland). As many of the states are large and different clusters of industry are represented in various sub-regions, as well as diverse education and training provision, attention to local characteristics and needs is an important development.
4. There is a very strong emphasis in the initiatives on the development of partnerships, networks and other collaborative arrangements bringing together representatives of VET and industry, government, and other bodies to consider changing skill needs and how they might be met. These arrangements support the flow of knowledge and ideas and thus greater mutual understanding. They also promote collaboration in finding solutions to needs and problems. Thus they support the identification of problems and challenges and the development of the most appropriate solutions.

There were also four main areas where further general improvements were possible:

1. Almost all of the states and territories had established bodies to advise the government on innovation, or innovation-related issues. These bodies usually included representation of government, of industry, of higher education and of the science and research communities. However, they rarely included a formal representative of the VET sector. This was an oversight that devalues the important role of VET in supporting innovation and it neglects the need for the sector to be informed of new developments early on to enable it to frame responses that are both appropriately and timely.
2. State and territory policy documents on innovation and initiatives are strongly focused on the needs, challenges and opportunities within their particular region. This is both fitting and unsurprising. However, regional borders often do not reflect the ways in which people form communities and in which industries

- cluster, nor the characteristics of particular geographic areas, or education and training provision. Although states and territories share many goals and aspirations there do not currently appear to be initiatives that involve co-operation or collaboration across state/territory borders. These could potentially play a useful role in supporting innovation and training in cross-border communities and industries.
3. Most states and territories have implemented centres and on-line sites to provide resources and other assistance to support innovation and the commercialisation of new products, processes etc. While it is important to have centres accessible in many different regions, and documents that provide information about the particular forms of assistance, as well as challenges and opportunities in each region, there appears to be considerable duplication of effort in the creation of more general resources such as material on how to produce and market a new product/service. A more co-ordinated, collaborative approach might thus free up resources for use elsewhere.
 4. This project did not specifically look at innovation initiatives undertaken by VET providers. However, during the course of the project a number of VET providers indicated that they undertake such activities in order to ensure that their provision remains current and relevant and to develop new provision in response to emerging needs. These activities can require substantial resources, particularly in staff time. However, there is often an element of risk in making a decision to undertake these activities, due to uncertainty about the return on their investment. Some providers expressed a view that they were 'doing it on their own', and received inadequate support or recognition for their effort from within the VET system.

Conclusions

The attention and support Australia's states and territories are giving to innovation is substantial. While it is being given in a diversity of forms, and often reflects particular strengths or interests at the state/territory level there are some types of initiatives that are common, such as support for the commercialisation of new products and services; and initiatives that aim to build stronger and closer connections between VET and those engaged in innovation, including communities, enterprises, industries and industry clusters.

The nature and extent of the support indicates that the states' and territories' interest in innovation stems primarily from a view that in the longer term it will provide both economic and social benefits. This is evident particularly in the documentation which announces and explains the various state/territory innovation plans, strategies, policies and programs, which invariably refer to 'economic prosperity', the 'generation of jobs and wealth' and the development of 'export potential' through innovation.

The extent to which new or reformed VET provision will be required as a consequence of the state/territory-supported innovation is unclear but even if only a small proportion of the innovation supported by the states and territories leads to changes in skill requirements, the potential need for a VET response may be substantial. Developments need to be closely monitored. The potential for innovation to generate economic and

social benefits may not be fulfilled if skill requirements are not able to be addressed due to a lack of appropriate VET provision at the ‘right’ time.

Although innovation initiatives are growing, there is no doubt that more could be done, and that some activities could be more effective. For instance, more co-operative and collaborative work between the states could reduce duplication in the provision of web-based support. This could consider joint development and provision of training resources as well as information to assist the commercialisation of innovation outcomes.

There would be benefits too from including VET representatives among the members of innovation advisory bodies to governments. This would allow VET early access to knowledge about the directions of innovation; it would also provide governments and industries with information about the kinds of VET responses that would be possible – and where further effort is needed to support the provision of appropriate and timely training. Currently VET is poorly represented on these bodies.

Further opportunities could also be given for VET personnel to contribute to research and development, particularly in industry sectors in which they have a high level of expertise. The Western Australian Science and Technology Innovation fund, which provided grants for training providers to collaborate with industry, universities, government and other bodies to undertake innovative science and technology projects with training outcomes might, for instance, be used as a model for this type of development.

There is considerable potential too for the states to learn from each other. Dissemination of information about the success of the various initiatives would enable other governments to adopt and adapt those that prove to be particularly effective. Some good ideas and practice suggested during this project, that might be considered more widely include:

- initiatives connecting VET and industry policies so that training implications are considered,
- initiatives which consider the implications for VET of the innovations they are supporting – VET included, e.g. industry clusters in South Australia,
- initiatives incorporating collaboration across state/territory borders,
- efficient use of the worldwide web to disseminate information and collect data,
- initiatives which demonstrate learning from previous experience,
- attention to resourcing issues,
- initiatives which enable VET staff to increase their expertise in new areas,
- initiatives which build on established expertise in VET, and
- initiatives which seek to develop new specialisations in VET.

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