

The role of VET in Australia's agrifood industry innovation system: lessons for other industry sectors

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Abstract:

Australia's agrifood industries are well served by a network of research and development organisations that represent strong partnerships between government, industry and providers of research & education services. A key feature of this network are cooperative research centres (CRCs) and research and development corporations (RDCs). The innovation system for Australia's agrifood industries relies to a large extent on the effectiveness of these organisations. However, in general terms, leading Australian commentators have identified the link between industry innovation and VET. This paper presents the findings of recent research conducted in late 2006 for the AgriFood Skills Council (AFSC). The paper outlines the findings of the research and recommends strategies for VET organisations wishing to play a more important role in industry innovation.

Introduction

In September 2006, the AFSC commissioned SCA to engage with relevant CRCs and RDCs involved in the industries within the scope of the AFSC. In particular, the project sought to identify the scope of current CRC and RDC engagement with the VET sector; identify issues and barriers to greater engagement; propose strategies for the AFSC to address those barriers and improve the links between VET, CRCs and RDCs; and identify possible initiatives involving AFSC, CRCs and RDCs.

Literature review

The innovation system for Australia's agrifood industries relies to a large extent on the effectiveness of CRCs and RDCs. In practice however, innovation comes from complex interactions between many individuals, organisations and environmental factors.

The European Commission has noted that the development of human resources is critical for the creation of new knowledge and for the diffusion of knowledge throughout society (EC 2000). A recent review of Australia's innovation system found that in some industries, the knowledge infrastructure, including research and training organisations, was well developed and played a key role in the continuous upgrading of technologies and firm level capabilities (Balaguer et al 2003). However, the study concluded that the overall picture that emerged was of 'a conservative innovation system that is only slowly generating sustainable new paths of technological accumulation such as through clusters or new sectors' (2003: 4).

Leading Australian commentators have identified the link between industry innovation and VET. Pickersgill (2005) notes that a skilled workforce is a key pathway by which

diffusion occurs and that the development of this skilled workforce is, in general, the domain of VET institutions. The VET sector has a dual role in industry skills development. On one hand it provides entry level training for new entrants and is responsible for apprenticeship and licensing training. On the other, VET delivers structured training to industry, either in the form of management level training or short courses for existing workers. Recent research indicates that across the livestock industries, for example, there are close to 5,000 enrolments in management level training at levels 4 & 5 of the Australian Qualifications Framework (UTAS 2006). Given the scope of the agrifood industries, the role of VET in industry development across the various sectors is clearly significant.

Innovations created by CRCs and RDCs often require a formal response from education and training systems. Mechanisms should be in place to ensure that new management and production practices identified by CRCs and RDCs are reflected in the skill standards and resources that support programs delivered in the VET sector. However, the time required to develop appropriate programs and materials and the capabilities of staff to deliver new courses means that VET planning should ideally start well in advance of the point where the training is required. Ferrier et al (2003) argue that this possibly lengthy process would be expedited if the VET sector were familiar with industry R&D and its potential to create new skill requirements. Links with the VET sector also provide CRCs and RDCs with access to new networks and extensive experience in working with industry. A recent DEST review found that some RDCs rely heavily on existing industry networks to deliver information on R&D outputs, while others have developed their own. They also note that RDCs have been involved in the development of a wide variety of training packages and tools which embody the results of R&D. However, little mention was made of links between RDCs and VET (CIE 2003). Indeed, whilst CRCs and RDCs are also increasingly important agents in extension and industry training in their own right, in many cases, they have little or no interaction with the VET system.

A range of studies illustrate that education and training play a vital role in encouraging the greater adoption of the innovative technical and business practices necessary for improved profitability and productivity on Australia's farms.¹ However, the responsibility for this training is largely borne by two sectors, the formal VET system, and the informal extension / industry training system which have developed largely in isolation and with limited linkages. Kilpatrick (2006) argues there is reason to believe that better alignment of the two would improve outcomes from investments in training, and improve rural capacity building.

Kilpatrick acknowledges that 'relationships between organisations involved in extension and VET influence learning and on-farm change', and argues that it is 'in the interests of rural industries that this relationship be strengthened' (2006: vii). Coutts & Roberts (2006) also suggest that RDCs and other agencies funding or developing structured training events in the rural extension sector should look to improve links between their programs and the VET sector through partnering with RTOs or aligning programs and products with nationally accredited outcomes.

¹ See for example Kilpatrick (2000) and Macadam et al (2004).

However, the potential for greater links between CRCs, RDCs and VET goes beyond the accreditation of extension and training programs, as not all skill needs arising from the innovations created by CRCs and RDCs require a formal response from education and training systems. As noted in the Corish report, the quality and responsiveness of the training market to the needs of agriculture needs to be improved (AFPRG 2006). The report argues that there needs to be effective consultation between the agriculture and food sector and the training market, so that specific needs are recognized and responded to and so that a partnership approach is adopted in developing learning activities.

Existing research on the links between VET and CRCs recommends that one objective for the future should be to build and strengthen the links between VET and CRCs in order to:

- Improve the timely flow of new knowledge to the VET sector to support planning for the delivery of VET to meet the skill needs arising from the adoption of innovations in existing industries and the creation of entirely new industries;
- Enable CRCs to make use of the strong VET links with industry (including in the design and delivery of training), the facilities of VET sector organisations and the skills and expertise of VET personnel; and
- Ensure the ongoing capacity of the VET sector to support industry innovation through professional development opportunities for VET personnel within CRC programs (Ferrier et al 2003).

If it is accepted that VET providers have a role in Australia's agrifood innovation system, CRCs and RDCs should review their engagement with the VET sector to take better advantage of the potential for wider adoption outcomes and to ensure their R&D has the greatest impact on workforce development. Gleeson (2002) argues that Australia's agricultural innovation system has failed to transfer powers and resources to local, community-based and responsive institutions, and that as our economy changes, rural knowledge workers need to adopt habits of continual learning. An assumption underpinning this study is that it is time for the VET sector to play a larger role in that transformation.

Research method

Telephone interviews of between 30-45 mins were held with key personnel from 35 research organisations. Those interviewed were typically Program Managers responsible for education, training and / or industry capacity building. A project brief was developed and provided to each respondent prior to the interview. Responses were recorded into a spreadsheet during interview, with respondents given an opportunity to review the final report prior to submission to the AFSC.

Findings and discussion

This section provides an overview of responses and consideration of the key findings. It is organised under headings that reflect the key questions asked of respondents.

a. *How do RDCs and CRCs expect the outcomes of their R&D to be picked up by education and training providers including those in the VET sector?*

Most RDC and CRCs do not have explicit programs for engagement with the VET sector. Most do however, develop university level modules and university accredited courses at the post graduate and to a lesser extent undergraduate level. Most RDCs and CRCs also conduct short technical courses and workshops that target industry and others in the value chain covered by the research organisation. Some of the research partner organisations have staff with links to VET, providing the research institution with informal VET contacts.

In most cases, RDCs and CRCs do not consider the education and training system as an important step on the knowledge adoption pathway. However, several RDCs and CRCs realise the value of VET to the dissemination and diffusion of innovation and have explicitly developed strategies for engagement with the sector. The CRC for Viticulture for example, has developed and delivered a series of Research to Practice workshops which were licensed to various providers including RTOs and enterprises. The program was an explicit strategy by the CRC to deliver research outcomes to the VET sector and to use those providers to engage with industry. This was a strategy resulting from the involvement of WINETAC² as a core party in the CRC. In addition to this program, there were more traditional extension activities and workshops in the CRC that were not accredited.

A few RDCs and CRC partner organisations do run accredited training as a means of delivering research and development outcomes to the education and training sector. The Salinity CRC has developed nationally consistent training programs based on new competency standards (Cert II-IV in Salinity Management)³, while the Forestry CRC partner with Melbourne University's School of Forestry at Creswick to run accredited VET training programs. Whilst VET oriented activity has been ad hoc in the past, many RDCs and CRCs are now considering what role VET can play in the dissemination of research outcomes.

Whilst some RDCs and CRCs have initiated formal relationships with the VET sector, the role that VET can play in the diffusion of research and development outcomes is still to be clarified in the minds of many CRC and RDC staff. TAFE NSW is an affiliate member of the Cotton CRC, but is still negotiating the nature and extent of its involvement. The fact that some CRCs have started to formalise their relationships with RTOs suggest that research organisations are starting to recognise the value of VET involvement. However, overall VET is not considered a priority as formal education and

² WINETAC was the Wine Industry Education and Training Advisory Council. It ceased operations in December 2005.

³ The standards, qualifications and resources were submitted to the AFSC for review during 2006.

training providers are generally not considered key players in industry capacity building or knowledge adoption in rural industries. RDCs and CRCs place greater focus on the adoption of research across the value chain, and do not necessarily view VET providers as intermediaries.

b. *To what extent do RDCs and CRCs develop structured training programs or workshops targeting industry?*

The findings indicate that there are three major approaches that shape the delivery of structured training programs and workshops targeting industry. Typically, RDCs and CRCs either develop and deliver the workshops themselves; fund other organisations to develop and deliver; or develop the programs themselves and then fund or license others to deliver.

Whilst most RDCs do develop structured training programs and workshops targeting industry, the scope and frequency of such activity varies considerably. Meat & Livestock Australia (MLA), for example, has the most comprehensive program of workshops and training courses of all RDCs. MLA's Edge Network includes 25 different workshops developed by the RDC and licensed to deliverers in each state and territory. In most cases, many RDCs fund other organisations to deliver practice change outcomes that may or may not involve the delivery of workshops or training programs. Often the choice is left to the funding partner or industry sector to determine the preferred delivery strategy.

The extent to which RDCs develop and deliver themselves is determined to some extent by resources. However, although the Grains Research & Development Corporation (GRDC) has the largest annual income of RDCs, it does not place a strong emphasis on workshops and training activities, preferring instead to fund grower groups and other industry networks to achieve specific industry practice change outcomes.

Other factors influencing the emphasis on workshops and training include the approach to capacity building adopted by the RDC. RDCs are increasingly under pressure from government and industry to increase the rate of R&D adoption, and RDCs respond differently to that challenge. Some RDCs indicated that structured training programs were about education and therefore outside of their remit, relying instead on informal workshops to provide information and updates on R&D. Amongst CRCs, the situation also varies considerably, with different approaches influenced by the nature of the research, the key audiences selected, and the preferences of the core and supporting parties involved. Whilst all CRCs are required to include an education program within their structure, workshops and structured training programs for industry are often delivered through the commercialisation program and thus are influenced not only by available resources but also by whether workshops and training are conceived as effective pathways to adoption and commercialisation.

The scope of the target audiences is also influenced by the nature of the research programs, the orientation of the core and supporting parties, and the range of service providers and intermediaries operating in the industry. An example of the varied scope of CRC activity is evident from the Cotton CRC which is working with the Cotton Research

& Development Corporation (CRDC) and funding from DEST to develop a “Skills Recognition, Training and Career Pathway” program which will develop an integrated VET training program for the cotton industry. CRDC are on the management committee for the project which has three components: Cotton Basics – entry level technical skills for yr 10-11; Cotton Seed – career focus for year 9-10 students and Cotton Advanced – programs for managers and contractors. The Program also includes a role for Tocal Ag College and incorporates a focus on the recognition of prior learning (RPL). As a result of the program, the Cotton CRC has also reported a culture shift in the attitudes towards industry education and training, where traditionally the focus was on the delivery of a post graduate Certificate in Rural Science (Cotton Production) through the University of New England. More recently however, the CRC, RDC and industry are working together to develop grower focused industry driven short courses that are aligned to national competency standards, including integrated pest management and water management for both irrigated cotton and grains.

c. To what extent do RDC and CRC programs and/or workshops deliver outcomes recognized by the VET system?

Of the thirty-five RDCs and CRCs consulted, fourteen, or 40%, indicated that they have at some stage developed programs and/or workshops that provide certification or an option for certification on completion. However, this figure does not suggest that 40% of all programs deliver outcomes recognised by the VET sector, as the vast majority of current offerings from RDCs and CRCs do not include assessment or deliver outcomes recognised by industry training packages. Much of the training delivered by RDCs and CRCs is short technical training based on single issues or specific technologies and not structured to deliver a qualification. In many cases, workshops delivered by RDCs and CRCs do not cover a whole unit of competency, may address performance criteria from more than one unit of competency, or cover entirely new areas not yet covered by competency standards.

Whilst a minority of these programs do include assessment as a mandatory component (see for example the Viticulture CRC Research to Practice workshops), the majority of programs that deliver recognised outcomes simply provide an assessment option for those participants who wish to obtain a credential. Examples here include programs developed by Australian Pork Limited (APL), which has mapped all its workshops against the competencies and encourages providers to provide certification options for producers. However, this research has found that there appears to be an emerging trend for RDCs and CRCs to consider the option of formal recognition now more than they have done so in the past. The Australian Egg Corporation Limited (AECL) provides an interesting example of this shift over recent years, moving from having no engagement with VET, to a stage where an RTO was engaged to design and deliver unaccredited programs, to the current situation, where the most recent workshop program was developed and delivered by an RTO, mapped against a competency and provided an assessment option for participants.

As many RDCs and CRCs see themselves primarily as providers of technical information, they often form partnerships with other industry stakeholders that might

deliver accredited training. These interdependencies also include links with industry associations as well as other RDCs and CRCs. These partnerships are more developed in some sectors compared to others, and in some ways reflect the extent of cooperation between the various organisations and the extent to which formal learning is emphasised within capacity building arrangements in the industry. However, across the organisations consulted, the majority of training activity initiated by CRCs and RDCs does not deliver nationally recognised training.

d. *To what extent have RDCs and CRCs sought to map or align these courses with industry competency standards?*

As is the case with delivery of recognised training, the approach to mapping programs and products against industry competency standards varies greatly across RDCs and CRCs. Of the thirty-five organisations contacted, eleven (31%) of organisations have never mapped programs or products with twenty-two organisations (63%) having undertaken some mapping at some stage. Given that 40% of respondents have offered training in the past, there is evidence that mapping products and programs against competency standards does not necessarily translate to the delivery of recognised training outcomes.

Whilst lack of resources was raised as a reason why mapping was not done, the CRDC received Farmbis funding to map the Cotton BMP⁴ program against the national Training Package. Once this mapping is complete, assessments will be available on farm to deliver a national qualification and meet the requirements of the industry program. This decision in part recognises that mapping is a necessary step to support adoption, but also acknowledgement that RTOs need to be supported by industry bodies to engage with smaller industry sectors that typically do not represent a viable market for RTO services. To some extent, whilst recent RDC and CRC efforts to map products and resources against national competency standards have been driven by the requirements of Farmbis, in some cases there is a genuine desire to provide RPL opportunities for producers. However, attitudes and priorities vary amongst the organisations, with some RDCs considering mapping not to be included in their remit and others citing additional cost and lack of expertise as a reason why mapping is not undertaken.

The research found that a number of RDCs and CRCs did not recognize the value of mapping programs and products to the industry competency standards. However, in some cases, the programs and products developed by RDCs and CRCs do not align with existing industry competency standards.

A number of CRCs also argue that standards and qualifications are either not in place for the occupations they target or that the outputs of their research programs are so new that they believe no relevant competency standards are yet in place. However, this view might also reflect a lack of understanding as to how standards are used and the place of individual technologies within them. Regardless, whilst there is evidence that RDCs and CRCs do map some products and programs against industry competency standards, it is

⁴ Best Management Practices (BMP).

clear that greater effort is required to make their outputs more suitable for use in the VET sector.

e. *To what extent have RDCs and CRCs relied on RTOs to deliver any of these programs or workshops?*

Of the organisations consulted, twenty-three (65%) indicated that they had in the past or currently did utilize the services of RTOs to deliver programs and workshops. This compares with the results for questions (d) and (e), which respectively saw 40% indicate that they have at some stage developed programs providing certification options and 63% having undertaken some mapping at some stage. Clearly the involvement of RTOs does not guarantee the delivery of recognised outcomes, or the mapping of products and programs. The pattern of RTO involvement in RDC and CRC programs varies according to a range of factors including the extent to which RTOs are active in the industry; the degree of RDC & CRC familiarity with RTOs active in their industries; the extent of formal links with RTOs, either as partners in a CRC or members of RDC education, training and or capacity building committees; and the extent to which their research outputs are relevant to VET.

The Viticulture CRC licensed RTOs along with other providers to deliver the Research to Practice workshops. Some RTOs were also involved in the delivery of extension workshops through the CRC as a result of WINETAC involvement in the CRC. This involvement also provided professional development opportunities for RTO staff, a priority that MLA and AWI are likely to support in the future through their involvement in the Sheep CRC's VET & Schools program. Recent developments in the Dairy industry reflect that industry's desire to engage with VET at a higher level. As a result of dissatisfaction with RTO provision in Victoria, DA and other industry organisations have established the National Centre for Dairy Education Australia at Goulburn Ovens TAFE on the understanding that the industry will determine the content of training and supply research findings from the RDC & CRC. The industry has also won a tender for dairy training in Victoria and is hoping to franchise the Goulburn Ovens arrangement with other TAFE colleges across Australia. A key aim of the new centre is to integrate industry extension arrangements with the training programs delivered through the new national centre.

This research suggests that whilst future involvement of RTOs in RDC and CRC programs is likely to increase, it remains to be seen whether this development will lead to broader engagement between research organisations and the VET sector.

f. *Do RDCs and CRCs believe they have contributed to the review or development of industry competency standards and national training packages?*

Of the organisations consulted, thirteen (37%) indicated that they have been involved at some stage in the development and / or review of industry competency standards and national training packages. A number of organisations have been aware of the development and review processes, but have been content not to become involved on the basis that industry associations or partner organisations have contributed. The level of direct involvement varies considerable. For example AWI and its predecessors have

taken particular interest in the wool harvesting competencies but has shown less interest over the years in the wider livestock production issues.

By comparison, the Salinity CRC has taken the initiative to develop new competency standards at AQF levels II-IV and has submitted them to AFSC for review. Despite this example, it would appear that the majority of RDCs and CRCs have not been involved in the development and review of industry competency standards and national training packages, thus missing a significant opportunity to shape the future content of VET programs.

g. Do RDCs and CRCs involve representatives of the VET sector in advisory panels or committees relating to education, training and/or industry practice change?

Of the organisations consulted, ten (29%) indicated that they involve representatives of the VET sector in advisory panels or project committees relating to education, training and/or industry practice change. However, it should be noted that a number of CRCs and RDCs do not have standing committees, or as is the case with the cotton and dairy RDCs and CRCs, they participate in wider industry education and training committees that involve VET representatives. Other than the Viticulture CRC, no VET bodies are core parties of a CRC, although TAFE NSW is an affiliated member of the Cotton CRC and has been a supporting party in the Sheep CRC. The Weed Management CRC has no formal links, but has strong working relationships with Murrumbidgee and Tocal Colleges and directly engages with RTOs in the development of VET resources. Some CRCs and RDCs such as AWI and HAL have staff with VET backgrounds, but typically the lack of direct involvement of VET organisations in RDCs and CRCs reflects the lack of acknowledgement that VET is part of the knowledge adoption pathway in the agrifood industries.

i. What priorities do RDCs and CRCs have for the VET sector?

Of the organisations consulted, twenty-one (60%) indicated that they have project or program priorities for the VET sector. Whilst these priorities include simple initiatives such as providing new technical information and products to RTOs, they also include relatively advanced and targeted initiatives that seek to address industry education, training and capacity building issues. A number of organisations indicated that they had no priorities either because they believe the issue is being addressed through the industry CRC, because they believe the onus rests with the VET sector to develop stronger links with key industry bodies, or that they focus on universities as the major link to the education sector. However, a number of organisations were in the process of formulating a VET strategy. A number of respondents indicated that their organisation was aiming to develop specific courses or provide resources for RTOs. A number of respondents also indicated plans or an interest in providing professional development for VET trainers. With in-kind support from AWI and MLA, the Sheep CRC will deliver a series of workshops for RTO staff in each State during 2006-07. In addition to these industries, a number of organisations have well developed VET strategies. For example, the Dairy CRC aims to contribute to the development of VET courses and establish a system where teachers who visit farms provide feedback on on-farm issues. The CRC also aims to develop shared resources with RTOs, and in partnership with DA, contribute to the

ongoing development of the National Centre for Dairy Education which will include efforts to standardise training and map extension activities against the competency standards in order to better integrate extension and VET activity. A number of RDCs and CRCs are clearly shifting to engage with VET through specific priorities. However, it is arguable that greater collaboration between CRCs and RDCs needs to occur to ensure that efforts are not dissipated and that sustainable engagement with VET occurs.

j. *What barriers do RDCs and CRCs see as preventing greater cooperation with the VET sector?*

A number of respondents indicated that a lack of understanding of the VET sector and the role VET can play in capacity building was a major barrier to greater involvement of CRCs and RDCs in the VET sector. Whilst some organisations suggested that there were not barriers per se, but a clear lack of mutual understanding, other organisations did identify quite specific barriers including communication difficulties with RTOs; CRC and RDC organizational culture that doesn't value VET; limited available resources to engage with the sector; the perceived irrelevance of VET to organisational priorities; unclear organisational mandate for VET; industry size and competition and fragmentation in thin markets.

Conclusions

The findings of the research suggest that in the agrifood industry, ongoing work is required to ensure that VET is recognised as a legitimate and important contributor to the industry innovation system. Although RDCs and a large number of CRCs are involved in agrifood industries, the issues raised here are clearly of relevance to other industry sectors. Whilst there are a number of structural issues preventing greater engagement between RDCs, CRCs and the VET sector, there are clear opportunities for individual RTOs to engage more effectively with research organisations. The following points outline key issues and opportunities for RTOs and VET agencies wishing to engage more fully with CRCs and other research organisations:

- there is a considerable pressure on resources within CRCs and other research organisations, and VET is often seen as generating additional costs and therefore an unnecessary drain on available resources;
- RTOs need to deal with the common perception that the VET sector is seen as inflexible and lacking in technical expertise;
- RTOs need to address the inadequate communication between VET and the RDC / CRC community;
- a lack of understanding of the VET sector and the role VET can play in capacity building is a significant barrier to greater involvement of CRCs and other research organisations in the VET sector;
- there is scope for professional development of CRC / research staff on workings of VET and the potential role of VET in industry capacity building;
- CRCs and other research organisations should be provided with up to date statistics on VET participation in different industry sectors;

- case studies and examples of how CRCs and other research organisations are engaging with VET and using the sector as a pathway to adoption would be a useful tool to encourage greater engagement;
- industry skill councils and other key industry VET bodies should work to revise current CRC Program Guidelines which focus on research and higher education, and provide no emphasis on VET, thus limiting its potential role in innovation;

Once CRCs and other research organisations become more aware of VET and the potential benefits of greater engagement, it is likely that additional resources will be made available to ensure greater interaction.

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