EDUCATION, TRAINING & SKILLS GENERATION IN CRCs

Australia's best capability working together

This Guide is part of a series of Guides aimed at industry, including small and medium enterprises, and others who are new to the CRC Program.

INTRODUCTION

Cooperative Research Centres (CRCs) are engines of innovation for Australia.

An initiative of the Australian Government, CRCs bring together the best minds from research and industry to work as a team.

Together, and driven by the needs of private, public or community end-users, CRCs turn research results into products, services and technologies and address national priorities within a local and global context.

This Guide has been developed by the CRC Association to help interested parties, both current and potential CRC partners, plan and implement their education, training and skills generation activities. It is part of a series of CRC Association Guides focused on providing useful information about the CRC Program to industry and other end-users, including small and medium enterprises (SMEs) and organisations unfamiliar with the CRC Program.

RATIONALE AND REQUIREMENTS

Since the first CRCs were established in 1991, the CRC Program has required CRCs to conduct education and training activities as a key tool in the transfer and application of CRC research findings, and as a means of developing future industry/sector capabilities.

The current CRC Program Guidelines reinforce the commitment to education and training by requiring CRCs to have *'an end-user focused education and training program at least including, but not limited to, a PhD program that complements the research programs and that builds engagement, innovation and/or research and development (R&D) capacity within end-users'*.

In addition to the mandatory PhD program, a CRC's other education and training activities can include Masters programs, undergraduate programs, short courses for CRC industry participant staff and other end-users, TAFE/VET programs, schools and community programs.

Recognition of the importance of education and training is demonstrated by CRCs giving them the same priority as research and utilisation activities. A dynamic education and training program is a key factor in attracting and retaining the best students and researchers to the CRC.

In addition to education and training activities, CRCs have broader communication and awareness activities to maximise the utilisation of their research outputs. These are described in the Guide titled Communication in Cooperative Research Centres.

BENEFITS OF CRC EDUCATION AND TRAINING

FOR END-USERS

- targeted development of prospective staff for end-user participants, including 'industry ready' graduates and postgraduates who have conducted research in an end-user setting and consequently have a better understanding and appreciation of end-user needs
- professional training opportunities for current end-user participant staff, e.g. through short course professional training
- increased professional dialogue and networking within end-user sectors through attendance at workshops, seminars and conferences
- increased capacity for research in a sector which helps build a base for ongoing innovation
- greater knowledge and potential transfer of innovative products, services and technologies developed in one sector to other sectors

FOR RESEARCHERS AND STUDENTS

- attractive source of fully-funded and 'top up' scholarships and other forms of financial assistance
- greater access to 'real world' experiences which promote a practical understanding of the needs of the end-users of research
- new possibilities for interaction with world class researchers and colleagues from other disciplines
- broader opportunities for co-supervision and/or mentoring from industry partners, State Government agencies or from different nodes within the CRC
- opportunities for overseas experiences including attending conferences, participating in study tours or placements with international participants
- enhanced employment prospects with CRC participants and spin-off companies created from CRCs
- increased personal development avenues in areas such as presentation skills and understanding of public policy development, commercialisation and intellectual property issues

FOR THE BROADER COMMUNITY AND AUSTRALIA

- promotes collaboration within the research sector and between researchers and industry
- increases Australia's base of skilled researchers working in areas of national and international importance
- fosters the development of industries and jobs of the future
- enhances the utilisation of research outputs
- increases community understanding of the value of new knowledge and emerging technologies

SCOPE OF CRC EDUCATION AND TRAINING ACTIVITIES

In addition to postgraduate programs, which are mandatory and the cornerstone of CRC education and training activities, CRCs have the flexibility to develop and deliver a range of other teaching and learning programs, some of which are described below. For specific weblinks see References.

POSTGRADUATE PROGRAMS (PhD AND MASTERS)

A CRC postgraduate program should develop 'industry ready' graduates. A CRC postgraduate program provides an orientation within industry, including equipping students with knowledge of an industry's culture and a network of contacts. Importantly, the research challenges to be tackled by PhD and Masters students need to be relevant to the end-user participants of the CRC.

A PhD program is a mandatory requirement for CRCs, however CRCs vary in the quantum of PhD students they seek to train. While the CRC Program Guidelines do not stipulate numbers, it is important to ensure enough PhD graduates are trained to meet the medium to long term needs of the relevant sectors. The latest National Survey of Research Commercialisation 2005-2007 noted that, in the period from 2005-06 to 2007-08, more than 1000 CRC-trained postgraduates were sourced from CRCs to be employed in industry. The postgraduate targets among CRCs, over the life of the CRC, currently range from 20 to 75.

PhD and Masters students may undertake short courses during their time with the CRC. Examples of courses that have proven beneficial include communication and leadership skills, media and presentation training, financial management, IT specialist courses, research program management, Intellectual Property management, commercialisation and policy development. One student of the Seafood CRC has been quoted as saying: "I did all sorts of courses with them, media skills, presentation training...that aren't normally on offer for PhD students".

Many CRCs support students to attend and present at national and international conferences. The CRC for Spatial Information, for instance, has provided scholarship assistance for students to attend conferences overseas.

CRC graduates are a legacy of the CRC, making significant contributions beyond the life of the CRC.

UNDERGRADUATE PROGRAMS

Some CRCs have supported the development of new and enhanced courses at the undergraduate level. This expands the range of education and training activities relevant to the field, helping build wider understanding and the supply of high quality graduate students. It also has the potential to inspire students to consider working and researching in the field of the CRC. CRCs also offer scholarship programs for summer school and honours students. One such program is offered by the CRC for Polymers.

SHORT COURSES FOR CRC INDUSTRY PARTICIPANT STAFF AND OTHER END-USERS

By providing short courses, workshops, industry field days and making presentations to conferences, CRCs maximise the utilisation of their research outputs by end-users. Transferring knowledge and skills to industry staff, particularly those employed by the CRC's participants, contributes to the professional development of those staff. In the CAST CRC for instance, a foundry safety course was developed and offered initially to one of the industry participants and thence to any company dealing with molten metal. Similarly the Cotton Catchment Communities CRC builds skills by offering flexible and innovative training courses for industry personnel. These courses, undertaken by cotton consultants, growers and their staff, assist the industry to retain its leadership in world's best practice cotton production.

TAFE/VET PROGRAMS

CRCs often need to build the technical skill base to support adoption of the CRC's new knowledge and technologies. This can be achieved by developing curriculum material or course modules for delivery by the vocational education and training (VET) or the technical and further education (TAFE) sectors. The Invasive Animals CRC, for instance, has developed new VET units to help managers think strategically about feral animal control.

"It was directly from my PhD that Hawker de Havilland took me on as one of their first trained researchers".

Student, CRC for Advanced Composites,
Australian Financial Review, 21/4/08

SCHOOLS PROGRAMS

Some CRCs include schools in their education and training program. The CRC for Sustainable Resource Processing won a CRC Association Award for Excellence in Innovation (2008), for their education program that aimed at increasing school teachers' overall knowledge of the minerals industry, as a way of stimulating their students' interest in this area. Education activities that focus on school students have the potential to inspire students to consider studying or working in the field of the CRC.

COMMUNITY PROGRAMS

Broader education activities develop wider community awareness and understanding of science, research and industry and promote the CRC's area of interest. For example, the collaboration between the Molecular Plant Breeding CRC and the Australian Centre for Plant Functional Genomics created the Gene Juice Bar that educated the public about food and genes. Through a collaboration with the CSIRO and the ABC, eWater CRC adapted one of the CRC's catchment management software tools to form 'Catchment Detox', a web-based simulation game promoting wise water use and catchment management during National Science Week in 2008.

In 2007 the CRC Association developed an information brochure highlighting the impact of the CRC Program on the Australian education system. This brochure provides excellent examples of CRC education activities that operate outside the PhD program.

POINTERS FOR NEW APPLICANTS

- ensure that CRC education and training activities contribute in an integral way to the achievement of the CRC's planned outcomes, particularly the utilisation of research
- give the planning of the education and training program the same priority as the planning and delivery of outcomes from research – start planning education and training early in the development of a CRC proposal and consider having a designated education specialist
- establish links between the education and training activities and communications activities of the CRC
- take advantage of opportunities for networking and identifying current developments in CRC education and training, including by attending the annual CRC Association Conference
- learn from the education and training experiences of other CRCs; the CRC Association can offer suggestions as to the most relevant CRCs to contact in relation to particular education and training issues

REFERENCES AND RESOURCES

ACPFG Vector Vol 1 Spring 2005
http://www.acpfg.com.au/vector/
acpfgmag_spring05.pdf

CAST Cooperative Research Centre
https://www.cast.org.au/
(go to Education, Industry Short Courses)

Catchment detox
http://www.catchmentdetox.net.au/

Centre for Sustainable Resource Processing
www.csrp.com.au/events/crcaaward2008.html

Cervini, E. CRCs expand operations to build skills, *Australian Financial Review*, 25/2/2008

Cotton Catchment Communities CRC
http://www.cottoncrc.org.au/content/Industry/
CRC_home.aspx

CRCMining Annual Report 2005-06
www.crcmining.com.au

CRC for Polymers
http://www.crcp.com.au/education/scholarships.htm

CRC for Spatial Information
www.crcsi.com.au/pages/AboutUs.aspx?MenuID=35

Grain Foods CRC
http://www.grainfoodscrc.com.au/education.php

Insight Economics, The Impact of Cooperative Research Centres on the Australian Education System
www.crca.asn.au/resources

Invasive Animals CRC
http://www.invasiveanimals.com/about/
training-project/index.html

Lebihan, R. Products of smart applications of intelligence and industry, *Australian Financial Review*, 21/4/2008 pp32-33

National Survey of Research Commercialisation
http://www.innovation.gov.au/Section/Innovation/
Documents/NCRC_final_030809.pdf

CRC students graduate with an enriched learning experience and a broad skills base.

FURTHER ASSISTANCE

CRC Association

02 6270 6524

www.crca.asn.au

CRC Program

02 6213 7177

www.crc.gov.au

CRC ASSOCIATION

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REFERENCES AND RESOURCES

See previous page.

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