

The Impact of COOPERATIVE RESEARCH CENTRES *on the* AUSTRALIAN EDUCATION SYSTEM

Innovation occurs when good ideas become reality. But innovation does not happen all by itself. To have innovation, we first need to have innovators, ie: the people who get those good ideas and can transform them into reality.

Cooperative Research Centres (CRCs) are recognised as the home of industry-focussed innovation and there has been a lot of attention given to the great innovations that the CRCs have been responsible for. Yet the role of CRCs in the creation of the all-important innovators is often neglected and unrecognised.

This paper has been compiled by the CRC Association to identify just a few living examples where CRCs are having an impact in the entire Australian education system: not just at the PhD level, but from Primary Schooling right through to university and beyond.

As this paper clearly shows, CRCs are not only the home of Australian innovation; they are also the breeding ground of Australia's innovators.



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PRIMARY SCHOOL

- In 2008 the *CRC for National Plant Biosecurity* commences an education program for students up to Yr4 and also for students in Yrs 5 to 10, to raise the profile of plant biosecurity in Australia. A pre-primary level activity is also being developed. The program is expected to reach over 1000 students in its first year. www.crplantbiosecurity.com.au
- The *CRC for Innovative Dairy Products* provides an online resource for primary schools that asks and answers the questions “what are genes, why are they important and how can we use our knowledge of them?” www.dairyrc.com
- The *CRC for Australian Weed Management* has produced the “Ghastly Guests” resource for Yr4 to Yr6 students. It is currently used in more than 300 classrooms across Australia. www.weeds.crc.org.au
- The *Cotton Catchment Communities CRC* has partnered with Primary Science Matters and provided science kits and training for teachers in primary schools in Northern NSW. web.cotton.crc.org.au

SECONDARY SCHOOL

- In partnership with the Australian Centre for Plant Functional Genomics, the *Molecular Plant Breeding CRC* has developed “Get into Genes”, an interactive program highlighting the role of gene technology in agriculture. Over 5000 students and teachers in SA and Vic have participated in the program. www.getintogenes.com.au
- Since 2004 the *CRC for Sugar Industry Innovation through Biotechnology*, via its PhD students, has run an annual ‘plant biotechnology for beginners’ workshop. Over 520 Yr10 and Yr11 students have participated in the events to date. www.crcsugar.com
- The *CRC for Australian Weed Management* has designed the “Lord of the Weeds” competition where secondary school students work on a weed project and submit a report for judging. A prize pool of \$4700 is offered. Since 2004 over 700 school classes have participated. www.weeds.crc.org.au

TAFE/VET

- The *CAST CRC* developed the educational content for a TAFE Engineering Production Certificate aimed specifically at the aluminium and magnesium casting industry. CAST also prepared and delivered a Light Metals Technology Course for TAFE teachers. www.cast.org.au
- The *CRC for Advanced Composite Structures*, together with the industry association Composites Australia, has developed a pre-vocational training program to provide a new influx of workers to a local composites industry desperately short of trained staff. Working together with local TAFE’s and Job Networks, to date 31 people from the target group of long-term unemployed have undertaken the training and are being transitioned into the workforce. www.compositesaustralia.com.au
- The *Invasive Animals CRC* is preparing a series of subjects addressing skill sets not currently available for managers of pest animals. These subjects will form the core of a Diploma in Conservation and Land Management to be awarded through the VET system and will be trialled in 2008. www.invasiveanimals.com

UNDERGRADUATE

- The *CRC for the Australian Poultry Industries* has sponsored the establishment of two undergraduate units at the University of New England. These units will soon also be available online. The CRC also has Honours scholarships for students in Australian universities conducting research into poultry related areas. www.poultrycrc.com.au
- The *CRC Wood Innovations* has developed an Advanced Diploma in Wood Products Management, sponsored by the CRC and taught at the University of Melbourne. 15 students will have completed the course by the conclusion of the CRCs term. www.crcwood.unimelb.edu.au
- The *CRC for Biomedical Imaging Development* supports summer cadetship programs through LaTrobe University; provides lecturers for undergraduate courses at RMIT; and supports medical honours projects through the University of Melbourne and Peter MacCallum Cancer Institute.
- The *Bushfire CRC, the Tropical Savannas CRC*, CSIRO and Charles Darwin University collaborated to develop the online university course 'Fire Ecology & Management in Northern Australia' The course tackles a wide range of complex ecological, social, political and historical aspects of fire management across northern Australia and won the prestigious National ASCILITE Award for Educational Design & Technology in Tertiary Education in 2005. www.edu.edu.au
- The *Parker CRC for Integrated Hydrometallurgy Solutions* runs a Student-Industry Research Program that provides a research experience for local and international undergraduate students for 10 weeks over their summer university vacation. www.parkercentre.com.au

POSTGRADUATE

- Postgraduate training is a key component of the CRC Programme. Each year the CRC Programme supports some 2000 researchers and educates more than 1000 PhD students (over 1600 full-time equivalent PhD students in 2005-06), with over 150 students graduating annually since 1991 (216 students graduated in 2005-06) and this number is set to increase.
- The new *Capital Markets CRC* is supported by industry partners, security exchanges, and regulators in Australia, the UK, Singapore, Hong Kong, Scandinavia, and North America. As a consequence of this international expansion, this CRC's PhD program will more than double from 70 to over 140 students. www.cmcr.com
- *RailCRC* are addressing the world wide shortage of Railway Signal Engineers through the development of Post Graduate Courses in Railway Signal Engineering offered by Central Queensland University. Certificate, Graduate Diploma and Masters Degree courses are also available. The qualification has been recognised by the UK-based Institute of Railway Signal Engineers. www.railcrc.cqu.edu.au
- *Grainfoods CRC* has sponsored an accredited 4 unit Graduate Certificate of Research Management, awarded through Southern Cross University. The course is now in its third year and has proved popular with PhD students and staff of participants of CRCs, as well as external organisations. www.grainfoodscrc.com.au
- The *Cotton Catchment Communities CRC* runs a cotton production course for industry personnel as an external course through The University of New England. The course involves four study units, and takes two years to complete. About 130 people have completed the course to date. web.cotton.crc.org.au

TEACHERS

- The *Centre for Sustainable Resource Processing CRC (CSRP)* provides a Teacher Program that gives school teachers the experience of hands-on activities in the minerals sector and is designed to foster an appreciation for the practical application of real-world problems to school curriculum.
- CSRP has partnered with Murdoch University to offer a series of one-day educational events for secondary science teachers. These events enhance teacher attitudes towards the mineral processing industry. Over 300 school teachers have participated to date. www.csrp.com.au

VOCATIONAL TRAINING

- The *CRC for Cochlear Implant and Hearing Aid Innovation*, in collaboration with staff of The Department of Otolaryngology, University of Melbourne, The Cochlear Implant Clinic, The Royal Victorian Eye and Ear Hospital, The Bionic Ear Institute and Cochlear Limited conducts four and five day cochlear implant professional training workshops for surgeons and clinicians from Australia and Asia Pacific regions. The workshops are run three times per year and since inception have trained over 2800 attendees. www.hearworks.com.au
- The *CRC for Contamination Assessment and Remediation of the Environment*, in collaboration with the Australian Contaminated Land Consultants Association and its industry partners is running a short-term training program about site assessment and remediation for recent graduates and industry managers. In two years CRC CARE has trained 250 industry environmental managers via 7 workshops. www.crccare.com
- *CRC Landscape Environments and Mineral Exploration*, *CRC for Predictive Mineral Discovery*, *Parker CRC for Integrated Hydrometallurgy Solutions*, and *CRC Mining* (in partnership with the Minerals Council of Australia and the Minerals Tertiary Education Council) are all involved in the provision of professional vocational training covering all aspects of the Mining sector 'Value Chain'.
- The *CRC for Spatial Information* has encouraged and supported industry and end user staff engagement on projects and activities. Today, the perceived remote sectors of industry, government and academia in the spatial information community are now much closer as the unique CRC structure has allowed each sector to better understand each others drivers and culture. www.crcsi.com.au
- The *CRC for Plant Based Management of Dryland Salinity* has developed and delivered accredited salinity management training throughout rural NSW, SA and Vic. In three years more than 700 staff in the Landmark agribusiness company, and about 900 landholders, state agency and catchment management organisation staff have attended 67 workshops over 120 training days. www.crcsalinity.com

COMMUNITY

- The *CRC for Advanced Automotive Technology* is supporting a Rovers (Scouting) initiative to convert standard vehicles to electric vehicles to compete at the Victorian Mudbash event. This exercise aims to increase public knowledge and understanding of the environmental impact of transport choices and to raise awareness of new technologies for more sustainable use of energy for transport. www.AutoCRC.com
- *Molecular Plant Breeding CRC*, in partnership with the Australian Centre for Plant Functional Genomics has a range of activities for enabling community decision-making on the role of gene technology in agriculture. More than 30,000 people have extracted DNA from food at community events across Australia. www.acpfg.com.au
- The *CRC for Construction Innovation*, in partnership with the Australian Sustainable Built Environment Council and the Department of the Environment and Water Resources through the Australian Greenhouse Office, will be launching the web portal www.yourbuilding.org, an actively updated knowledge bank about the ownership, design, construction, occupation, and operation of sustainable commercial buildings. This development supplements the already-established www.yourhome.gov.au and www.yourdevelopment.org portals. www.construction-innovation.info
- The "Take Care With Contacts" campaign for safe contact lens use followed the major microbial keratitis study conducted by the *Vision CRC* and the Institute for Eye Research, with excellent media coverage highlighting the importance of lens hygiene and prompt care, and the establishment of a website to provide information for the public and practitioners. www.visioncrc.org

OTHER

- The *Centre for Sustainable Resource Processing CRC* is researching the motivating factors that entice people to choose research careers within the mineral resource sector. A questionnaire has been developed and validated with an initial sample of 240 scientists within the minerals and energy sector. www.csrp.com.au
- The *CRC for Sugar Industry Innovation through Biotechnology* is funding several research projects to understand how to better educate the community, industry and students. www.crcsugar.com