CQUniversity Australia

THE UNIVERSITY’S APPROACH TO RESEARCH

CQUniversity seeks to become one of Australia’s most Engaged Universities with an emphasis on globally relevant activity that benefits the Central Queensland region. The invigoration of research as one of the key pillars in CQUniversity’s growth has focused on identifying key areas of research specialisation that will benefit the Central Queensland stakeholders. The Vice Chancellor’s vision is for CQUniversity to become one of the top twenty institutions in Australia, recognised for its applied research that engages with key stakeholders.

Our focus has been to emphasise research with relevance to the region, involving aspects of regional development, growth in resource industries, environmental management, issues associated with quality health care in rural and regional communities, and education delivery specifically through use of modern technology.

These areas of research emphasis are largely embedded within a framework of Research Institutes and Centres:

**Institute for Health & Social Science Research (IHSSR)**
- Centre for Longitudinal and Preventative Health Research
- Centre for Mental Health & Wellbeing
- Centre for Physical Activity Studies
- QLD Centre for Domestic and Family Violence Research
- Population Research Laboratory

**The Institute for Resource Industries and Sustainability (IRIS)**
- Centre for Environmental Management
- Centre for Plant and Water Science
- Centre for Railway Engineering
- Centre for Intelligent and Networked Systems
- Process Engineering and Light Metals Centre
- Power Engineering Research Group
- Business Research Group

**The Appleton Institute**
- A newly acquired research group in Sleep Behaviours and Human Factors
- Based in Adelaide, SA
- Significant focus on Fly-in / Fly-out and Drive-in / Drive-out fatigue management

**The Education Research Flagship**
- International Education Research Centre
- Learning & Teaching Education Research Centre

CQUniversity also hosts the Conservatorium of Music in Mackay, providing Central Queensland with a significant Performing Arts Centre emphasising Jazz Dance and Musical Drama.

One focus of CQUniversity’s “research resurgence” is enhancement of its people through investment in new personnel and development of its existing academic staff. The Engaged Research Chair (ERC) initiative will seek to appoint ten new high profile Professors in the areas of research focus over the next five years. These individuals will have responsibility to establish a world class research group within their discipline area as well as contribute to the development and growth of existing researchers in CQUniversity. We have currently appointed two ERCs, Professor Brenda Happel and Professor Drew Dawson, who respectively lead the Institute for Health and Social Science Research and The Appleton Institute.

A number of initiatives have been established to develop existing academic staff including an Early Career Mentoring program, internal professional development initiatives and the Health Collaborative Research Network. CQUniversity leads the Health CRN in partnership with UQ, QUT and Curtin University. The Health CRN links areas of strength – such as social and population health, and medical and allied health sciences - to contribute to better health outcomes for the region and broader Australian communities.

**AREAS OF RESEARCH STRENGTH**

Our areas of research strength in the Science, Technology, Engineering and Mathematics disciplines include:
- Mechanical and Electrical Engineering
- Nursing and Allied Health
- Population Health
- Human Factors research
- Applied Mathematics
- Animal and Plant Production Systems with specific emphasis on Land Management
- Environmental Management
- Restoration Ecology and Rehabilitation of marine, freshwater and terrestrial systems
- Marine Biosecurity

We also have a strong research focus in Humanities, Arts and Social Sciences including:
- Education Research
- Psychology
- Applied Economics
- History
- Creative and Performing Arts
In the 2010 Excellence in Research for Australia (ERA) exercise, CQUniversity reported on 12 two-digit and 16 four-digit Fields of Research resulting in an ERA rating of World Class for Engineering (09) and Medical and Health Sciences (11), specifically in Nursing (1110). Using the Scopus database (SciVal), we have a demonstrable strength in Mental Health Nursing, rated top in the world for our research outputs. Similarly, our Electrical Engineering, Applied Mathematics and Applied Economics disciplines are recognised as in the top ten groupings based on Scopus publications.

The changes in ERA in the 2012 exercise, coupled with the changes to CQUniversity staffing profile, we believe will result in a much stronger performance than previously, demonstrating excellence in Applied Mathematics, Environmental Science, Agricultural Science, Economics and Education in addition to Engineering and Medical and Health Sciences. Many of these areas represent recent investments in new academics to enhance the volume and quality of activity within a discipline area.

Our focal areas of research growth will highlight these areas, but also emphasize the Humanities including Business and Tourism, History and Creative and Performing Arts.

**IMPACT OF RESEARCH**

Our applied research focus emphasizes the translation and uptake of research findings to meet external stakeholder needs – the focus is not merely on increasing academic publications and citation rates. Several aspects of our research are oriented towards real-world outcomes including: provision of high quality outcomes through translation and application of current research findings (Mental Health Nursing, Family and Domestic Violence; Population Health; Education Practice); influencing government policy and regulatory frameworks (Fatigue Management in Fly-in/Fly-out and Drive-in/Drive-out long distance commuters; Marine Biosecurity frameworks); and developing greater understanding of social issues of the day and contributing to decision-making through salient advice (Economic considerations of conflict between agrarian and resource extraction uses).

More detail on a few of the many impacts from research undertaken at CQUniversity is provided below:

**Education Research**

CQUniversity has one of the longest collaborative industry higher education research partnerships with the Australian Publishers Association (APA). The partnership research projects have focused on developing high quality teaching and learning materials for school and university students. This research led to the establishment of the Australian Awards for Excellence in Educational Publishing in partnership with the APA, the key event in Australian educational publishing and has helped the industry to develop quality benchmarks and publishing standards. Professor Mike Horsley is the chief judge of the awards and manages the awards process with the APA, and edits the journal of the international Association for Research on Textbooks and Educational Media.

More recently the Learning and Teaching Education Research Centre has developed Eye Tracking facilities and methodologies to research digital textbooks and student self-regulation in online learning environments, leading to Australia’s initial eye tracking research methodology conference Eye Track Australia 2012.

**Applied Economics**

Professor John Rolfe and his team of economists have undertaken a suite of works to inform the trade-offs between land, environmental and resource uses in rural / regional Australia. One stream of work focuses on evaluating environmental protection and recreation aspects of natural resource management, with recent applications of non-market valuation techniques to protection of the Great Barrier Reef and coastal assets. Another stream of research focuses on regional development, estimating the economic impacts of resource industry developments on regional economies, employment and housing markets and how those impacts vary with factors such as long distance commuting. The third major area of research is in the agricultural economics space, with applications of bioeconomic modelling, production frontiers, auction theory and adoption analysis to a variety of primary industries and issues across eastern and northern Australia. These works have provided state and commonwealth government authorities with sound bases for decision-making.

**Media History and Biography**

Media history has attracted increasing research attention both in Australia and overseas during the last decade. Professor Denis Cryle has built both national and international links with Australian and British scholars through the biennial Australian Media Traditions conferences, as a long-serving member of its organisational committee (2002-2011), and as an Honorary Fellow of the Centre for Media History based at Macquarie University, as well as internationally, as reviewer and editorial committee member for the *Media History* journal, based in the United Kingdom. His work, which includes ARC competitive research, continues to feature in international collections, in a field which has become increasingly global, spawning media conglomerates, like Rupert Murdoch’s *News...*
Corporation. Professor Cryle has written extensively on Murdoch’s Australian operations and influence (2008) and is currently writing a biography of colonial communications giant, Sir Charles Todd, as well as co-authoring an extensive history of the Empire and Commonwealth Press Union in Australia, India and New Zealand over the twentieth-century.

**Gambling Research Laboratory (GRL)**

Assoc. Prof Matthew Rockloff heads the GRL, which uses experimental means to investigate gambling disorders. The GRL has investigated psychological risk factors for the development of gambling problems, social factors impacting on Electronic Gaming Machine (EGM) betting, the use of gambling “consumption” as a predictor of gambling problems, and the impact of EGM jackpots on player behaviour. The GRL is supported by an in-house developed EGM simulator and the infrastructure of the Population Research Laboratory at the Institute for Health and Social Science Research. Members Dr Matthew Browne, Dr Philip Donaldson and Dr En Li use these resources to provide a unique ability to focus on difficult research problems needed by policy makers, treatment providers and gambling-help educators.

**Non-invasive Assessment in Agriculture**

NiAg is concerned with the non-destructive analysis of quality attributes of agricultural, and in particular horticultural, produce, and associated agronomic and supply chain management actions to optimise production outcomes. The activity falls under a ‘precision agriculture’ descriptor. The group has achieved commercialisation of its work with near infrared spectroscopy, in terms of on-line sorting of fruit with Colour Vision Systems/MAF-Roda P/L, and in terms of an in-field handheld application with Integrated Spectronics P/L. Work continues to evolve instrumentation features and develop new applications.

**Precision Livestock Management**

Precision agriculture is a growing area of research that has emerged from a need to improve efficiency and productivity in global food production. Dr David Swain is leading a small team that are developing research that is focussed on developing precision management tools for northern beef production systems. The research work includes the use of wireless sensor networks to track and monitor cattle behaviour in response to a range of environmental and management drivers. CQUniversity are providing leadership in precision livestock management, Dr Swain recently chaired a working committee that identified strategic research priorities for precision livestock management for the Northern Australian Beef Research Committee.

**Ecological Security Laboratory**

The Ecological Security Laboratory focusses on research that elucidates human mediated impacts on biodiversity and species in the marine and coastal environment and developing remediation and management options. The laboratory has a transdisciplinary focus, working across both the natural and social sciences to identify the pressures, the state of the environment, and to develop innovative solutions that effectively translate into policy and management. This extends to all aspects of the process, including identifying risks, determining how impacts occur in space and time, measuring, and mitigating impacts. Specifically the laboratories research focusses on marine ecosystem restoration, marine bioinvasions and marine conservation (including environmental generational amnesia) and marine debris.

**Marine Biosecurity**

Marine biosecurity is the management of non-native marine species arrivals and impacts in a quarantine context. Australia has long been a leader in this field, both for the underpinning research in marine systems, but also in relation to regulatory and management frameworks. Professor Chad Hewitt and Professor Marnie Campbell have led the development of this field in Australia and most recently developed a risk framework that underpins the recent changes to regulation of vessel entry into Australia based on the marine growths on their hulls. This suite of risk assessments has now also been applied by the US Department of Defence to the potential risks to Micronesian island ecosystems of marine introductions associated with relocating US Marine Corps assets from Okinawa to Guam.

**Queensland Centre for Family and Domestic Violence**

The CDFVR is jointly funded by Queensland Government and CQUUniversity to support the development of policy and practice in the field of domestic and family violence prevention. It has built relationships with government and community agencies, including in rural, regional and Indigenous communities; facilitated the role out of best practice; and, in collaboration with the government and community services, has established and maintains a state-wide database of non-identifying client data. Most recently it completed a Queensland state-wide study on intimate partner abuse of women and an evaluation of the Queensland Government’s Trial Integrated Response to Domestic and Family Violence in Rockhampton.

**Centre for Mental Health Nursing Innovation**

The CMHNI promotes CQUUniversity’s strengths and achievements in mental health nursing and to strengthen engagement between the university,
industry partners and research collaborators. Professor Brenda Happell heads a team of researchers undertaking studies in the areas of physical health of people diagnosed with a mental illness; consumer participation in mental health education and service delivery; triage; and, mental health nursing education.

**Innovative Nursing Education**

CQUniversity has a strong focus on Nursing Education. Associate Professor Kerry Reid-Searl has developed a unique and innovative learning/teaching technique (**Mask-Ed KRS Simulation**) that uses realistic special effects silicone props to provide the experienced lecturer the ability to don whole body parts and assume the persona of a patient. The experienced lecturer disappears and the patient, with a history relevant to the learning experience, becomes the platform for teaching. Learners are provided with realistic simulation experiences. This technique has revolutionised the way nurses are educated at CQUniversity and the technology is now being taken up by a variety of Universities in Australia and overseas.

**HEALTH COLLABORATIVE RESEARCH NETWORK**

The Health CRN was established in 2011 with Commonwealth and University funding to develop collaborative research partnerships between CQUniversity, the University of Queensland, Queensland University of Technology and Curtin University. This was designed to enhance pre-existing research strengths at CQUniversity and leverage pre-existing research collaborations to cement synergistic research relationships between CQUniversity and the larger metropolitan universities to provide CQUniversity researchers access to larger facilities while providing metropolitan researchers better access to health networks on the ground in rural and regional communities.

The aims of the Health CRN are to achieve quality successful grant applications and publications by harnessing the benefits of collaborative relationships enhanced by staff exchanges and secondments between the partner Universities. Through the auspices of the Health CRN, CQUniversity has now hired four new Research Professors in targeted areas of Health and increased the leadership development capabilities across a range of disciplines. This increase in quality mentoring and support for early- and mid-career researchers through in-house leaders will be coupled with opportunities for student and staff exchange to other Universities.