

University of Ballarat

# Future Research Directions

Research is a defining feature of a university. The University of Ballarat is a recent entrant in the field of research but already its research quality and outputs are growing rapidly. Over the last five years the University has aimed to become research credible and began focusing its research effort by the creation of a number of research centres.

The University is now embarking on a new phase of development in research through the creation of four Research Themes.

Investment of scarce available resources in research will be mainly into these four Themes which have been developed. The Themes will receive significant internal funds over three years to help create an environment that will produce outstanding outcomes of international research excellence. In order to receive such support, the successful groups were required to demonstrate high levels of capability and strategic goals that were in line with those of the University.

The Themes are deliberately broad and each covers several disciplines and Schools. This multidisciplinary approach will help the research teams address important challenges faced by the University's communities in its regions of operation and beyond. Our research will especially focus on the development of innovation through effective partnerships with other educational institutions, industry, busi-



Professor Frank Stagnitti

ness, governments and community organisations. While theoretical and so called "blue sky" research will be important, there will be an emphasis on useful applications of research to help address a range of social, environmental, economic and cultural issues that face contemporary society.

It is not surprising that the fields covered by the Themes are also some of the University's areas of strength in teaching and learning. The essence of scholarship involves an interconnection where research informs our teaching and student learning is enhanced by participation in research activities.

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## APPROACH CHARACTERISED BY

Commitment to excellence in research Priority research themes – areas of research focus

Contribute to innovation through knowledge partnerships

Continue to build a supportive research environment Increase HDR places for research training

Support the achievement of excellence in both learning & teaching and research

Provide significant funding for the priority research themes and to support research excellence in areas not aligned with the themes

## RESEARCH THEMES

REGIONAL FUTURES

INFORMATICS AND APPLIED OPTIMIZATION

ADDRESSING DISADVANTAGE AND INEQUALITY IN EDUCATION AND HEALTH

INJURY PREVENTION AND SAFETY PROMOTION

Research excellence will continue to be supported as well in areas not aligned with these themes.

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Research that does not fall under the broad umbrellas of the four Themes will still be encouraged at the University of Ballarat. However, already we are seeing disparate groups coming together under the Themes to tackle research questions when the silo structure seen in traditional systems would mean such interaction was difficult. Being a small University, Ballarat can quickly respond to challenges and meet the requirements of different partners and those of our own researchers. Small size also means our researchers work easily with each other across disciplinary boundaries.

The health of a university's research culture is often reflected in its early career researcher and higher degree by research student population. The University of Ballarat is committed to increase our HDR load and to especially support these students and our early career researchers through quality support programs.

This is an exciting time in the development of research at Ballarat. The establishment and development of Research Themes will allow a concentration of expertise and an ability to build depth and focus. Investment of internal funds from the University should help the groups grow their outputs and quality to enable acquisition of external research funds through both national competitive grants as well as from other sources such as governments, industries and businesses. The goal will be for the Themes to be self supporting after a number of years, and well regarded nationally and internationally as areas of research excellence. They will contribute to the University of Ballarat's distinctiveness and help create an institution that attracts high quality students, staff and visiting researchers.

## Regional Futures



Professor Peter Gell



Professor Julian Lowe

Regional Futures has been identified as a priority research theme in response to the needs of the regional communities served by the University.

It builds on the considerable experience and knowledge base of researchers in the Centre for Regional Innovation and Competitiveness (CRIC), the Centre for Environmental Management (CEM) and the Water in Drylands Collaborative Research Program (WIDCORP, based in Horsham).

The theme leader is Professor Peter Gell, Director CEM, with deputy leader Professor Julian Lowe, Director CRIC.

Recent research projects that align with the Regional Futures theme include:

- Household behaviour change in the context of changing economic, resource and environmental constraints (CRIC, The Vic Water Trust, Central Highlands Water, DEWHA)
- Evaluating the economic and social impact of e-health initiatives (CRIC, Grampians Regional Area Health)
- The sustainability of social enterprises (CRIC, Department of Planning and Community Development)
- Valuing a landmark urban water resource (CRIC, Vic Water Trust)
- MySmart Green: An entrepreneurial approach to greening small business (CRIC)
- Identifying farmer typologies, perspectives and aspirations of the Wimmera Mallee pipeline (WIDCORP)
- Demonstrating the impacts of ground tank closure on biodiversity and landscape function in southeast Australian rangelands (CEM)
- The recent Victorian drought and its impact: without precedent? (CEM, with Monash University and EPA)

- Auditing the ecological outcomes from landcare (CEM with Parks Victoria, the Corangamite and Glenelg-Hopkins CMAs)

The Regional Futures theme involves two distinct types of research:

- Theorists will use a range of economic and behavioural methodologies to model and predict emerging patterns of change in technology, society and the economy, and contribute to an understanding of how, for example, demographics, enterprise and industry, work, leisure, social organisation, ICT and other technologies, science, and housing will look like in our region (and other regions) in the next ten years.
- Qualitative and quantitative data is collected through surveys, census and case studies to understand the impact on regional growth of changing resource availability, sustainability in environment, water and energy and climate change.

Regional Futures includes a broad range of potential research topics and disciplines. It is anticipated that bringing researchers together under this theme will promote the adoption of interdisciplinary research approaches to significant issues that will impact our region and other similar regions in Australia and internationally.

Researchers from the Centre for Environmental Management are expected to contribute their established expertise in applied ecology to the Regional Futures theme, to understand natural systems and determine the impact of human activity on ecosystem condition in order to influence the adoption of ecologically sustainable principles.

Regional Futures is expected to contribute strongly to social, economic and environmental innovation.

## Informatics and Applied Optimization



Professor John Yearwood



Dr Andrew Stranieri

The Informatics and Applied Optimization theme focuses on real world applications of mathematics. Research areas include mathematical model-

ling and optimization of complex systems, with application to: energy, water and telecommunications industries, informatics (data mining) and decision sciences, including applications to, health, ICT and Internet commerce security. Research in this theme is expected to produce economic, social and environmental benefits.

This has been identified as a priority theme as it builds on the existing strengths of the Centre for Informatics and Applied Optimization (CIAO).

The theme leader is Professor John Yearwood, Director CIAO. Dr Andrew Stranieri is deputy leader. CIAO is recognised as one of the leading centres in optimization in Australia, and CIAO researchers have achieved international prominence. CIAO includes more than 40 researchers and 40 PhD students.

Recent projects undertaken include:

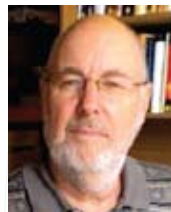
- Optimizing the uplift of natural gas (Woodside Energy)
- Mining the adverse drug reaction database (Therapeutic Goods Administration)
- Internet commerce security (IBM, Westpac, Vic State Government)
- Office space optimization (Kann Finch Group)
- Optimization of water pipeline operations (GWM Water).
- Anthropometry and optimal fit of aircrews to cockpits (Australian Defence Forces)

As illustrated by the above examples, this priority research theme is expected to contribute strongly to the national innovation system through the application of mathematics to produce innovations primarily in industrial and technological settings.

Included in this theme is research into the modelling of knowledge and reasoning in organisations, with potential to contribute to social, economic and environmental innovation.

This theme will continue to recruit the highest-level intellectual capability possible, and researchers will collaborate with peers across the world, industry and government to leverage ideas.

## Addressing Disadvantage and Inequality in Education and Health



Professor John Smyth



Professor Warren Payne

This theme is identified as a priority research theme as disadvantage and social inequality within/among communities is of international importance as well as of importance to the immediate region serviced by the University.

The research brings together groups and teams of researchers from multi-disciplinary and cross-disciplinary backgrounds into three focussed areas:

- Education and community engagement
- Physical activity and wellbeing
- Healthy communities, productive ageing and supportive care

Participation in the work of the Theme is open to researchers from across the University. Currently researchers from the Schools of Education, Human Movement and Sports Science, Behavioural and Social Science and Humanities, Science and Engineering and Nursing are engaged.

We wish to better understand the issues around education and health in communities that have been put at a disadvantage. We listen to these communities as we develop the direction of our research and involve them in our work through developing participatory research models. We work with communities, industry partners, government and other researchers within Australia and internationally to explore new ideas and communicate what we find.

The primary focus will be on a longitudinal study of a sizeable and very diverse community with a long history of various forms of disadvantage and exclusion. This community, known as the South, is on the southern side of a major regional city. In addition, there will be an articulated process for the 'feed-in' of research that might be occurring by members in other sites, in ways that enhance and advance understandings of the Theme in the primary site.

The Research Theme supports research in the area of understanding disadvantage and inequality in education and health through:

- Providing research 'microfinance' to assist in establishing exploratory projects
- Funding short visits by eminent international scholars
- Hosting research conferences to share research ideas and finding with other researchers, government agencies, industry partners and the community
- Providing support and mentoring for researchers

The Research Theme does not have a strongly defined structure. It operates in a collaborative way with researchers 'opting in' to research projects that are of interest to them.

The theme leader is Professor John Smyth (School of Education) and the deputy leader is Professor Warren Payne (School of HM&SS). The theme manager is Mr Tim Harrison (School of Education).

Recent research projects undertaken by these researchers include:

- Individual, institutional and community capacity building in disadvantaged schools (ARC Discovery Grant)
- Enhancing school retention in regional/rural areas (ARC Linkage with WA Department of Education)
- Evaluating evidence-based treatment of depression in adolescents using Acceptance and Commitment Therapy delivered in rural/Regional Services (Beyond Blue)
- Calls to Lifeline – a marker of rural health (ARC Linkage with Uniting Care and Lifeline Australia)
- Informal learning through community-based men's sheds (National Centre for Vocational Education)

## ➤ Injury Prevention and Safety Promotion



Professor Caroline Finch



Professor Dennis Else

Researchers from two Schools at the University have achieved international

and national recognition in the area of safety and injury prevention. Researchers in the School of Human Movement and Sport Sciences (HMSS) are recognised for their contributions to injury prevention, safety promotion and injury surveillance across a range of contexts, including sport, active recreation and falls.

VIOSH, in the School of Science and Engineering is recognised for its contribution to Occupational Health and Safety. These strengths provide the rationale for Injury Prevention and Safety Promotion being identified as a priority research theme for the University. This theme includes research into injury prevention, safety promotion and occupational health & safety (OH&S) across sport, active living and work-place settings.

The theme leader is Professor Caroline Finch, NHMRC Principal Research Fellow, School of HMSS with deputy leader Professor Dennis Else.

This theme capitalises on the current international and national leadership at UB in sports safety and OH&S.

Recent projects undertaken by these researchers include:

- Evaluation of the effectiveness of training programs to prevent knee injuries in community-level Australian football (NHMRC)
- Sports ground and surface conditions and their possible relationship to sports safety (Sport and Recreation Victoria)
- Development of a module for training exercise scientists about falls prevention and exercise prescription in older people (Commonwealth Department of Health and Ageing)
- The prevention of injuries in the wall and ceiling industry in Victoria (WorkSafe Victoria)
- The prevention of injuries in the thoroughbred horse racing industry in Victoria
- Helping organisations to develop more resilient safety cultures characterised by more adaptive work practices and better understandings of and ability to respond to gaps between work as imagined and work as actually performed



The University will make a significant investment of internal funding in the priority research themes, as well as supporting research excellence in areas not aligned with the research themes.

Other internal resources will be aligned with the priority research themes.

After the establishment phase, priority research themes will be expected to attract matching funding from external sources.

The success of the next phase of research at the University of Ballarat will be characterised by the words Collaborative, International, Significance, Impact and Relevance.

"The University of Ballarat has grown remarkably in research terms over the past ten years. I look forward to the University continuing to build its research profile in the areas of these strategic research themes. Above all else it is the ongoing commitment of our staff to research excellence that will determine our future".