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It is with great pleasure and excitement that I have become Vice-Chancellor of Victoria University. I have outlined in other publications and fora my vision for the University, and will restrict my comments here to the University’s position as a provider of research and a training ground for new researchers.

Last year’s Annual Research Report reviewed the University’s growth in research and research training since becoming established as a University in 1991. It is my hope and expectation that we continue to grow our research and become a national leader in our strategic areas of research endeavour. To this end, I will be most interested in the development of the Research and Research Training Functional Plan during 2004, and would expect that additional support will be provided to those areas of research concentration that provide the University with the greatest opportunity to grow and enhance our research reputation.

Victoria University has long had a strong interaction with industry and Government, with over 61% of our research income arising from these sectors, and I expect that the University will extend and expand these interactions. The proposal to establish cross-disciplinary Institutes, that will embrace both Higher Education and TAFE, will provide a strong focus and vehicle for such interactions to grow.

I conclude my remarks by thanking those University staff and students who have already made an impact as researchers and research supervisors. Research and research training is a central feature of a modern vibrant University, and I intend that we will continue to make it an important part of what Victoria University will do in the future.

Professor Liz Harman,
Vice-Chancellor and President
Introduction by the Pro-Vice-Chancellor (Research and Development)

One of the University’s strategic aims is to concentrate our research activities into a small number of areas in which we hold or can develop positions of national, and indeed international, leadership. This concentration is consistent with Government policy also. At present, University research is concentrated through Research Centres and Key Research Areas (KRAs), the latter being broader groupings that focus on and encourage cross-disciplinary research.

In recognition of our broader commitment to industry and community groups, particularly in the western region of Melbourne, the University will create a number of Institutes that will both replace and expand the Key Research Areas. The Institutes will provide industry, community and government with access to training and education programs, as well as research and consultancy. We intend to establish a small number of University Institutes during 2004, to provide industry, community and government organisations a single point of entry to University expertise, and allow the University to provide whole of organisation solutions to significant problems.

2003 has proven to be another year of growth and improvement of Victoria University’s research outputs. In many of the key performance indicators reported to and used by Governments to judge and reward research output, we have improved our performance. Research income has increased by 24%, from $5.9 million to $7.3 million; research publications have increased 9% from 474 to 519 author weighted points; the research student load decreased from 409 to 382; and completions of higher research degree theses decreased by 76 to 67. These outputs generally ranked us around third among the New Generation Universities (NGUs). One of the big challenges to this University is that not only are we improving our performance, but all other universities, including the other NGUs are increasing their outputs at a similar or faster rate. Unfortunately, Federal Government policy in relation to the research block funding schemes, has meant that our increased activity is not always rewarded, with the 5% capping to any increase in the Institutional Grants Scheme (IGS) having cost the University over $1.5 million in research support over the last three years.

Research training continues to be a major focus for Victoria University. With over 600 students enrolled in higher degree research programs, some of whose work is highlighted in this Report, we have developed a range of programs to support this activity. In recognising that postgraduate research students are a critical component of our research activity and of our role as a University, our restricted capacity to increase our Government-funded HDR student load remains a major challenge.

Victoria University’s research and research training activities are planned in a cycle of continuous improvement: Plan, Do, Review, Improve. The University’s Research and Research Training Functional Plan will govern these activities from 2004 to 2008, aligning them to major objectives set out in the new Strategic Plan covering the same period. In doing this, the University seeks to further enhance its performance in research and research training, particularly in attracting external research income and research students. The Plan will further concentrate University activities in selected strategic areas to ensure that our research and research training continues to be relevant and appropriate to the needs of the western region community and beyond.

Professor Vaughan Beck, Pro Vice-Chancellor (Research and Development).
In 2001, Telstra decided to close its high-voltage testing facility and donate the equipment with an estimated replacement value of $2 million to the Scienceworks Museum of Victoria. Professor Akhtar Kalam who is the Victoria University Deputy Dean for the Faculty of Science, Engineering and Technology, saw this as a unique opportunity since he had been looking for a facility containing high-voltage equipment suitable for lecturing and research activities.

In a joint effort between Scienceworks, Victoria University and various industry partners, building of the Victoria University High-Voltage Theatre at Scienceworks commenced in 2002. In March 2004 the facility will be opened officially at the Scienceworks Museum located in Spotswood, Victoria, approximately 10 km from the Victoria University Footscray Park campus.

Although high-voltage test equipment is presently being installed for post-graduate student research use, Professor Kalam already has one PhD student using the facility. Hassan Al-Khalidi, who is working on a project that is being supported by the Office of the Chief Electrical Inspector (OCEI), is looking at addressing issues regarding underground high-voltage power cables. Hassan hopes that he can utilise the new facilities to set up an experimental platform at the Victoria University High-Voltage Lab, in order to experimentally measure and characterise underground cable ratings, capacity and electrical stresses. The equipment central to this platform is the high-voltage / high-current impulse generators which are currently being installed into the lab by...
Two impulse generators are currently being installed into the high voltage lab. These are capable of producing very short pulses of electrical energy generating voltages in the range of 1.4 million volts and capable of delivering electrical currents up to 5000 amps. It is anticipated that the impulse generators will be fully operational by late December.

Furthermore, Professor Kalam has indicated that once the lab is fully tested and functional, steps can be taken to introduce new high-voltage electrical engineering subjects. It is hoped that by utilising the high-voltage facility for lectures, demonstrations and research activities, students may be inspired to seek out a career in this field, addressing the identified shortage in Australia of high-voltage electrical engineers.

Email contact details:
Akhtar.Kalam@vu.edu.au
There is considerable focus, both in policy and practice, by western Governments on the need for social capital and social connectedness in communities. For young people, social connectedness is named as a key protective factor by a number of leading American researchers. However, in Australia, such connectedness is often interpreted as a part of a young person’s social development, as opposed to their right to be active participants in the society, making policy and decisions that affect them every day.

The Foundation for Young Australians has recently commissioned research on their new model of Governance, which has meant that places previously held by adults on their Board and Philanthropic Grant Committees are now held by young people. The research led by Robyn Broadbent, is to document and evaluate this initiative, not only within the narrow confines of success, defined as the participation of young people, but within a broader framework that asks more complex questions. Among these the research asks: What impact has this change of Governance had on the organisation? What contribution has the experience made to young people in relation to their own life’s journey, skills development and community leadership potential?

This project is not only important because of its intrinsic value to the organisation. As a philanthropic trust, whose mission is to enhance the lives of young people, such a governance model leads the community by its example. It opens a much wider debate about the rites of passage for young people who are often confined to an “active citizenship” role: active in their contribution to participation in events, youth roundtables, Local Government youth advisory committees and even an increasingly marginalised role of youth politics, our own student union being an example.

Yet where will our future leaders come from? Why aren’t young people sitting at the same table as adults to provide their diverse perspectives? A reluctance to share the spoils of power may be one reason. Whatever it is we reaffirm our status as an increasingly divided society when the division is based on each stage of our lives: class, gender and age.

This research is presently a part of a portfolio of work that includes the Leadership and Mentoring Program with the Community Building Resource Service. The Maribyrnong Gateway Project, as another project in the portfolio, has brought young people to the table to be active in the professional development of staff teams that were the focus of the research. What is important in the research is that the framework of practice is a participatory one. It ensures that the key informants are provided equal opportunity to participate, reflect and be critical about the progress of the work, both for the development project and the research into factors facilitating participation. Young people have a right to be included in the governance of their community and more importantly in society as a whole. As a community, we need to include them as a fundamental component of their rite of passage. Our future depends on it.

Email contact details: Robyn.Broadbent@vu.edu.au
Indonesian transformations

Indonesia has been experiencing political, economic and social transformations since 1997. The Asian financial crisis acted as a catalyst in these transformations. It undermined the legitimacy and authority of the “New Order” government forcing President Soeharto to resign in 1998.

One of the challenges faced by Indonesia has been to advance democratisation at the same time as maintaining national unity. The financial crisis and the fall of Soeharto greatly weakened the authority of the central Government over the outlying regions in the archipelago. A weak ‘Jakarta’ facilitated the revival of independence movements in East Timor, Aceh and Papua as well as creating the context for the outbreak of sectarian and ethnic violence in Maluku and Sulawesi. The separation of Timor Leste strengthened the determination of the Indonesian government to resist the demands of the independence movements in Aceh and Papua. In Aceh and Papua, the Indonesian Government was confronted with the dilemma of how much freedom of political expression and organisation could be tolerated when those freedoms were used successfully to mobilise support for independence.

After the fall of Soeharto, political activists in Aceh and Papua had a choice of joining their fellow Indonesians in a struggle to create a more democratic political system, or use the greater political freedoms to revive nationalist aspirations for independence. In Papua, the nationalists created a territory wide movement that sought independence through peaceful means. Dr Chauvel wrote a report for the International Crisis Group in 2001, when the independence movement was at the height of its influence. The report supported the Special Autonomy Law and argued that the law’s effective implementation could create the policy framework for the resolution of the conflict between Papua and the Indonesian government. Unfortunately, the government of Megawati Sukarnoputri has sought to undermine rather than implement special autonomy. Dr Chauvel’s research on Papua continues with the support of the East West Center Washington’s project on “The Dynamics and Management of Internal Conflicts in Asia”.

The sectarian violence in Maluku and Sulawesi has different histories and poses distinct challenges to the Indonesian Government. Relations between Moslem and Christians in Ambon have always been central to understanding the dynamics of Ambonese society.

The sectarian violence in Maluku and Sulawesi has different histories and poses distinct challenges to the Indonesian government. Relations between Moslem and Christians in Ambon have always been central to understanding the dynamics of Ambonese society. The failure of conflict management mechanisms in January 1999 led to three years of violence costing thousands of lives. In the conflict members of the security forces fought on both sides. Dr Chauvel has given papers at the University of Hawaii and the US State Department on the history and dynamics of the sectarian violence in Ambon.

Email contact details: Richard.Chauvel@vu.edu.au
http://www.staff.vu.edu.au/aapi/

Researcher:
Associate Professor
Richard Chauvel
Director, Australia Asia Pacific Institute.
The greatest environmental concern associated with mining metals such as gold, platinum, silver, copper, cobalt, nickel and other base metals is the disposal of the significant amount of organic solvents and other toxic and environmentally unfriendly chemicals that are used in their conventional methods of extraction. The most significant environmental risk, for example, from the cyanide solutions used in gold mining, is the possible leaching into soil and groundwater of cyanide at toxic concentrations, or catastrophic cyanide spills that might inundate an ecosystem with toxic levels of cyanide. Thus, getting rid of the use of solvents and other toxic chemicals is of interest to many mining industries and certainly the interest of the research conducted at the School of Molecular Sciences at Victoria University.

Currently, Victoria University, with collaboration from Deakin University, Monash University and The University of Melbourne, developed the solventless and environmentally friendly method of extracting metals. This method involves synthesizing membranes that are made up of poly (vinyl) chloride (PVC), and the metal-extracting agents. These membranes are then used to extract metals such as gold, copper, cadmium, mercury, cobalt.
and nickel. This method has been found to successfully extract metals without the use of any solvent.

Traditionally, the agents used in the extraction of the metals are dissolved in organic solvents. The solvent containing the extracting agent is contacted with the aqueous solution of the metal, and the extracting agent then removes the metal. Thus, the first step in developing this solventless method of extraction is to identify ways in which the extracting agents can be utilised to extract the metals without the need of any organic solvent. One very effective way that we have developed is by incorporating these agents into passive solid support material, PVC, to form membranes. The PVC allows the extracting agent to be part of the membrane but plays an inactive role in the extraction of the metals.

At the School of Molecular Sciences, using this method, we have successfully extracted gold without the use of either cyanide or toxic organic solvents. Nickel and cobalt have been selectively separated using this method, in which, traditionally, no method has been found to separate these two chemically similar elements. Currently, a patent has been applied for this work. Cadmium, mercury and copper have also been extracted successfully from wastewater effluents. None of the work in this research requires the use of any organic solvent.

It is hoped that, in the near future, mining companies can support the research work that is being carried out in this area.

Email contact details:
Rohani.Paimin@vu.edu.au
Combining research and community engagement for conserving threatened species and developing water-wise strategies appropriate for western Melbourne

Research team:

Dr Colin Hocking, Sustainability Group, and
Dr Jenni Rice, Wellness Promotion Unit;

Postgraduate students Randall Robinson and Craig Wallace; and
Iramoo staff Jill Crowe, Debbie Reynolds, Megan O’Shea and David Steart.

In recent times there has been much discussion about Melbourne’s water supply problems. Similar problems occur in many places in Australia and elsewhere, resulting from our unsustainable use of water, combined with dry conditions, possibly resulting from global climate change. What actions will contribute to solving our water availability problems in Melbourne? One way is to include local native plants in our parks, and in back yards, to help reduce the water needed for their growth, and to maximise plant survival in years of drought. Where are the plants we might use for these strategies?

Melbourne is located on part of Australia’s most threatened ecosystems: the vast lowland wildflower grasslands that once covered over one quarter of Victoria. Until recently, most Melburnians have been unaware of the existence, diversity and beauty of our local native wildflower species. At Victoria University there has been a coordinated approach to research and development of management and repair methods for what remains of the wildflower grasslands that contain these wildflowers, as well as education and community engagement to assist in their protection and promote their existence and use.
Ecology based research has investigated ways to minimise the spread of invading weeds that threaten to over-run rare wildflowers, as well as developing ways to get these wildflowers to spread by producing new plants from seed. The weed control research has focused on one of Australia’s worst environmental and pasture weeds, known as Chilean Needle Grass. A key feature of the success of this weed is its huge seed production, and capacity to re-colonise sites from which mature plants have been removed using herbicides. As part of a coordinated research effort, overseen by the National Chilean Needle Grass Task Force, Victoria University has partnered with land management consultants to document and refine best management practice for control of the Chilean Needle Grass seed bank. This will allow shires and councils, as well as Parks Victoria and land-owners with significant biodiversity or grazing values, to get Chilean Needle Grass under control. Further research over the next year hopes to determine how effective these methods will be across Eastern Australia, and specific for a range of conservation and agricultural land types. These are useful outcomes for both conservation of biodiversity, and for agricultural productivity.

Over the past two years, the outcomes of this research have combined with practical community engagement to build a community friendly water-wise garden at the Iramoo Sustainable Living Precinct, in the north-west part of the St Albans campus. To do this, Iramoo has combined with Sustainability Street, a Western suburbs wide initiative with major funding from City West Water, EcoRecycle Victoria and the State Government (plus other contributors). Using local native plants, grown from seed collected on or near the site, and contemporary design features with sustainability elements (for example, recycled crushed concrete paths) the smart garden introduced community volunteers and VU students across environmental and community development studies, to new solutions to sustainability problems. A parallel program of sustainability gardens in schools has also begun, and hopefully will be developed again further in 2004.

This initiative has led to a wider partnership with the developers of Sustainability Street, and funding applications for major community engagement for sustainability initiatives, involving academic staff across conservation, community psychology and community development. This is a prescient example of how research, development and community engagement can combine to produce positive outcomes for VU, the regional community and state-wide agencies and sustainability organisations.

Funding and resources for this project have been provided by the Federal Government Enviro Fund: $15,000 in 2002-2003; National Heritage Trust Weeds of National Significance: $81,600 over two years; Buckland Foundation: $160,000 over three years; Sustainability Street support with funding contributions from City West Water; EcoRecycle Victoria and Victorian State Government.

Email contact details:
Colin.Hocking@vu.edu.au
Not only are science and technology increasingly important in today’s world, but they are intertwined in a complex continuum. Unification of science and technology based on unity of matter and its holistic investigation is occurring at a rapid pace through nanotechnology.

It is a popular belief that Richard Feynman provided the initial impetus for nanotechnology in 1965 in his famous lecture “There is plenty of room at the bottom”. This lecture conceptually revealed the potential for miniaturization at the atomic scale, a trend which has continued ever since. The definition of nanotechnology is still fluid, as the field is not only new, but also emerging and interdisciplinary. The fields of nanoscience and nanotechnology are broad and still exploratory, with connections to almost all disciplines and areas of relevance.

A group of researchers in the Centre for Strategic Economic Studies (CSES) has been working on projects involving nanotechnology. Since 2003, CSES has been commissioned to undertake three projects involving policy development and analysis of nanotechnology. The group, led by Professor Peter Sheehan, prepared a report “Small Scale Technologies: Directions for Victoria” for the Victorian Government, with the purpose of assisting the implementation of a strategic initiative in nanotechnology at the State level. The report focused on research capabilities and industrial capabilities, existing or developing, in Victoria in the new fields such as (bio)nanotechnology, MEMS (micro-electro-mechanical-systems) and microfabrication. One major aspect is on the interplay of life sciences and physical sciences in this new economic environment in Victoria and Australia in general.

Another interesting direction in our research is the convergence of three major general purpose technologies: biotechnology, nanotechnology and information technology. Technological development has led to convergence of knowledge in education and theoretical conception, in markets and sometimes in the products and services area. The main enablers of this process are information technology and more recently nanotechnology. This project is funded under an ARC Linkage Grant and the sponsors are the Victorian Government, the Federal Government, Starpharma and IBM Life Sciences. Another project is on innovation models in nanotechnology and is funded under the Victoria University Discovery Grants scheme.

Email contact details: Dana.Nicolau@vu.edu.au
During 2003, John Houghton led a study into Changing Research Practices in the Digital Information and Communication Environment. The study focused on how research practices are changing and what the implications of those changes are for research communication, research infrastructure and evaluation.

Concentrating on three key areas of research activity, namely communication and collaboration, information search and access, and dissemination and publication, we looked at: how researchers conduct their research; what their major information sources are; how they access, use and manage information; how they use their sources in the creation of new content; how they communicate with colleagues and disseminate their findings; and how information and communication technologies are changing their research activities.

We found that there is a new mode of knowledge production emerging, which is changing practices and bringing new information access and dissemination needs. There is increasing diversity in the location of research activities; an increasing focus on interdisciplinary and transdisciplinary research; an increasing focus on problems, rather than techniques; greater emphasis on collaborative work and communication; and greater emphasis on more diverse and informal forms of communication. There is also increasing demand among researchers for access to a wider range of sources; for access mechanisms that cut across disciplinary silos; and for access to, and management of, non-traditional digital objects. Research databases, related software and other analytical objects are now core tools.

Many factors have influenced the development of the existing research infrastructure and scholarly communication system. Its elements have evolved and have often been considered separately. As a result, developments have been somewhat piecemeal and there are sometimes conflicting forces at work. In essence, we have inherited a system that is designed around a notion of research practice that is no longer entirely valid (ie. one that is disciplinary rather than interdisciplinary or transdisciplinary, evaluates and rewards individuals rather than teams, rewards publication in scientific journals rather than wider dissemination and commercialisation, measures traditional activities like publication of academic papers rather than the posting of gene sequences, software, visual or musical compositions to open access archives, and judges quality with little regard to relevance or impact). As a result, the system of incentives tends to work against the full development of emerging areas of research, such as biotechnology and nanotechnology, which are inherently collaborative and interdisciplinary.

The project was funded by the Commonwealth Department of Education, Science and Training, which recently announced an intention to develop Quality and Accessibility Frameworks. A key element will be linking research evaluation to communication, dissemination and commercialisation (ie. to align better evaluation and rewards with desired outcomes).

Email contact details:
John.Houghton@vu.edu.au
In the photograph the calorimeter is being used to estimate the heat release rate of a fire burning in a special enclosure 2.0 m wide by 8.0 m long by 0.6 m high, which is being used to study fires that might occur in a single storey of a multistorey building.

Research team:
Professor Ian Thomas
Director,
Dr Ian Bennetts
Michael Culton and
Robert Ralph
Centre for Environmental Safety and Risk Engineering (CESARE).
A major new facility for the Centre for Environmental Safety and Risk Engineering (CESARE) in Building 5 on Werribee Campus has now been developed and commissioned.

The facility is an ISO Room (a standard size room 2.4 m wide by 3.6 m long by 2.4 m high) which can be used for tests to ISO 9705:1993, or for much more interesting research on fires in rooms or enclosures in buildings, and an associated calorimeter. The calorimeter enables the power of the fire (the heat release rate in kW) to be measured by measurement of the rate at which oxygen from the atmosphere is used by the fire. Because most materials use about the same amount of oxygen to generate the same amount of heat, measurement of the rate of oxygen consumption provides a good estimate of the rate of heat release.

In fire safety engineering design of buildings for fire, the heat release rate of fires that may occur inside the building is a primary input to analysis of the effect of the fire on the building and its possible effect on the occupants of the building. Understanding these effects and preventing or mitigating them is a fundamental basis for design of the buildings and the systems in them, to achieve a high level of safety.

In the photograph the calorimeter is being used to estimate the heat release rate of a fire burning in a special enclosure 2.0 m wide by 8.0 m long by 0.6 m high, which is being used to study fires that might occur in a single storey of a multistorey building. In these experiments the placement of the fuel and ventilation of the enclosure are varied to measure the effect of changes in each and both of them.

This facility has been funded by contributions from an ARC Linkage Grant, OneSteel, BlueScope Steel, Boral, and Victoria University, and has been substantially built by members of the staff of the Centre, Robert Ralph and Michael Culton.

Email contact details:
Ian.Thomas@vu.edu.au
What does the average Australian man want to look like? Recent studies of popular culture indicate that notions of the male body ideal have indeed changed in the last twenty years, with greater muscularity now being considered both acceptable and desirable. In addition, men’s bodies have become more visible in, for example, men’s lifestyle magazines, men’s fashion and in advertising, so that the image that men see is of a young, lean and muscular body that is ‘an idealised and eroticised aesthetic’.

Media images of women have been blamed for influencing girls’ and women’s body image and it is probable that these images of men’s bodies also create pressure for men to look a certain way. Recent evidence has revealed that body image is not only a concern for women, but that men too can be dissatisfied and preoccupied with their bodies. The nature of this dissatisfaction is not a desire to be thin, as is the case with women, but to be more muscular. This desire for muscularity is one reason why many men are motivated to go to the gym to train with weights, and in our society where we need to be more physically active, this might be viewed positively. However, the desire for muscularity can also be linked to negative health behaviours such as exercise addiction, use of androgenic-anabolic steroids, and, in a very small number of men, to the development of a disorder known as Muscle Dysmorphia. Identified some years ago by Associate Professor Precilla Choi and collaborators in the US, this disorder is likened to a form of reverse anorexia (anorexia affects primarily women); sufferers are pathologically concerned that their bodies are not sufficiently muscular when they are, in fact, usually very muscular.
Because big muscles and strength signify masculinity, we are currently investigating the relationships between masculinity, health beliefs and behaviours and body image in men. Funded by Andrology Australia, we have surveyed men of different ages from a number of well established Melbourne gyms and found that the drive for musculature and concern about body appearance is more prevalent in men up to the age of thirty years. These men, our study found, would like to be about 5kgs more muscular with about 7% less body fat. In the next phase of our research we will be interviewing men to explore age differences in body concerns and what they might mean for men, their masculine identity and their health.

Email contact details:
Precilla.Cho@vu.edu.au

Recent evidence has revealed that body image is not only a concern for women, but that men too can be dissatisfied and preoccupied with their bodies.
The Ageing Well Study was developed as part of the Global Ageing Initiative, an international collaborative research project that involved 14 countries and targeted older adults aged 50-89 years. The project was initiated by Indiana University, USA to examine adaptation and wellbeing in older people. This Victorian Study of Ageing Well, carried out by researchers from Victoria University’s Alma Unit for Research on Ageing (AURA), is the Australian component of the wider international project, The Global Cross-Cultural Project on Ageing Well.

The model seeks to estimate the direct causal contribution of 5 key components - physical health and functional abilities of daily living; mental wellbeing and efficacy; material security and resources; social networks and supports; and activity and leisure pursuits, which are deemed to influence the outcome variable ‘ageing well’.

These core aspects reflect six of the ten key research priorities of the United Nations Agenda on Ageing for the 21st century (United Nation, 2000). The UN stated Agenda is for countries everywhere to address four universal concerns:

1) the situations of older persons;
2) life course development;
3) multi-generational relations, and
4) macro-societal implications.

Ten key research priorities have been proposed that include:

i) healthy ageing;
ii) biomedical mechanisms of ageing;
iii) physical and mental health;
iv) caregiving systems;
v) quality of life;
vi) social integration;
vii) policy process and evaluation;
viii) effects of changing family structures and functions;
ix) economic security; and
x) macro-societal change and development.

The findings inform domestic governmental policy development, [they] guide the development and delivery of education programmes in higher education institutions that are directly concerned with ageing processes and services needs, [and they] identify similarities and differences between ethnic groups using Anglo-Australian data as the criterion reference group.

In sum, this study contributes to Australian research knowledge on ageing through considerations of migrants’ experiences living within a multicultural environment, an issue that has been under-researched. During 2000-2001, the Phase I of the study of 404 adults was carried out in the western suburbs of Melbourne with participants from the Australian-born English-speaking, Italian and Vietnamese communities. Preliminary findings from this study indicate that the Anglo-Australian respondents were significantly more satisfied with their ageing than either Italian or Vietnamese participants with Vietnamese participants more satisfied with ageing than the Italian respondents.

Email contact details:
Carol.Morse@vu.edu.au
Falls in older individuals have been identified as a major public health issue and a national research priority. It has been estimated that falls cost the Australian community $3 billion per annum, being the most expensive of all the injuries, including motor vehicle accidents. Recent research has also indicated that more than 50% of falls are caused by trips and slips.

The CARES Biomechanics Unit has recently made a breakthrough in the area of falls research by developing an individual-specific measure of the probability of a person tripping or slipping while walking. This involves analysis of foot clearance data for tripping risk estimation, and analysis of foot-ground frictional characteristics for slipping risk assessment. All of the Unit’s falls-related research projects use long-term data collection procedures (e.g., analysis of up to one hour of continuous walking) to better understand gait control systems by way of statistical modelling and applications of various artificial intelligence and chaos techniques. So far, research in this area has included analysis of healthy young and healthy elderly individuals, elderly with a falls history, and individuals with lower limb amputations. Current research projects are directed towards a better understanding of the causes of falls as well as devising techniques for detecting falls-prone individuals.

The potential for the application of this research in the multi-billion dollar area of falls prevention is significant. Currently, gait and falls research is a major focus of the Biomechanics Unit and includes six postgraduate and two staff research projects. External research collaborations include Australian (ACU, Deakin University, Monash University, University of Melbourne, CSIRO) and international Universities (University of Waterloo, Canada; Minnesota State University, USA) and Falls Assessment Clinics at Western General Hospital (Sunshine) and the National Ageing Research Institute (NARI). Our current collaboration with the world-leading University of Melbourne Artificial Intelligence (AI) group involves applications of state-of-the-art AI techniques for a better understanding of gait processes and the development of innovative gait models to detect individuals at risk of falling. Current research support in this area includes a Victoria University Discovery Grant (2004) in collaboration with A/Professor M. Palaniswami of the University of Melbourne.

Email contact details:
Rezaul.Begg@vu.edu.au
Diabetes: Heart of the matter

Research team:

Associate Professor Lily Stojanovska;

PhD Student Suzy Honisett School of Biomedical Sciences; and

Associate Professor Paul Komesaroff; and

Dr Bronwyn Kingwell Baker Heart Research Institute, Alfred Hospital.

Type 2 diabetes has reached global epidemic proportions, with 194 million people worldwide estimated to have type 2 diabetes. Australia has one of the highest diabetes rates among developed countries, with one in five people over the age of 65 affected. Currently over one million Australians aged 25 and over have type 2 diabetes, with just as many undiagnosed cases. The number has doubled since the early 1980s and it is expected that 1.2 million Australians will be affected by the year 2010. Type 2 diabetes usually occurs in people who are over the age of 50 years, who comprise 85-90 per cent of all diabetes cases.

Environmental factors such as lack of exercise and obesity, together with genetic factors, appear to be responsible for the condition, with females more likely to be affected than males. Diabetes contributes to early death, illness and disability with an estimated annual health care cost of $1 billion, a cost that may reach $2.3 billion by 2010.

The primary cause of mortality in the type 2 diabetic population is heart disease, which is a major risk factor associated with stiff large arteries, called atherosclerosis, which plays an important role in the pathogenesis of heart disease. An alteration in glucose metabolism, often present with diabetes, may be associated with diminishing oestrogen levels in menopause. Oestrogen decline is also associated with an increased incidence of cardiovascular disease. Age and menopause significantly add to this cardiac risk profile. Around menopause women experience a dramatic increase in large artery stiffness. Diabetic postmenopausal women have between three and seven times the relative risk of dying from cardiovascular disease than non-diabetic women.

Hormonal therapy prescribed for menopausal symptoms has been associated with improved vascular function in healthy postmenopausal women. Until recently there has been no evidence of the effects of hormone therapy on metabolic parameters in diabetic women. The choice of hormone therapy is important as not all regimens produce favourable results.

Rosiglitazone, a new treatment for type 2 diabetes, improves blood glucose and may therefore provide an effective treatment for populations at high risk of cardiovascular disease, such as postmenopausal women with diabetes. Recently we conducted a clinical study to investigate the effectiveness of rosiglitazone and hormonal therapy in isolation and in combination of the two, to see which treatment will provide greater benefits with respect to cardiovascular risk reduction in postmenopausal women with established diabetes. This type of study has not previously been examined in an animal or human model. In a double-blind study, women were tested before and after 12 weeks of daily treatment with either rosiglitazone or placebo. At 12 weeks in addition to rosiglitazone, women either received hormone therapy or placebo. Measurements of blood lipids, glucose, blood pressure, endothelial function (flow mediated dilation) and arterial stiffness (arterial compliance) were performed at the beginning, 12 weeks and 24 weeks of the study. Our findings indicate that rosiglitazone improves diabetic control by reducing blood glucose levels and beneficially affects cardiovascular risk parameters by reducing blood pressure and increasing compliance of large arteries in diabetic women. The addition of hormonal therapy to rosiglitazone did not alter major cardiovascular risk factors.

This study shows that a reduction in blood pressure and an increase in large artery compliance as obtained by rosiglitazone is an effective treatment to improve glycaemic control and may reduce the risk of coronary artery disease in postmenopausal women with type 2 diabetes. However, long-term studies are required to determine whether these observed effects are sustained.

Funding of $20,000 was received from the Australian Menopause Society to conduct this study.

Email contact details: Lily.Stojanovska@vu.edu.au
Incontinence is a common health problem affecting over 2 million Australians. It can have a profound impact on quality of life and all aspects of a person’s life. People with incontinence can experience extreme embarrassment and the condition can easily result in social isolation. The Commonwealth Government has recognised the extent of the problem and its impact on the health and wellbeing of those Australians experiencing continence problems by creating a $31 million, 7-year programme - the National Continence Management Strategy - to help address the problem. This project on transition care was funded under the Innovative Grants programme of the National Continence Management Strategy.

The project brings together researchers and clinicians from Victoria and Melbourne Universities, Caulfield General Medical Centre, The Alfred Hospital and the Royal District Nursing Service. It is one of a number of projects developed by Associate Professor David Fonda of the Caulfield General Medical Centre Continence Service and Professor Colin Torrance to address specific issues related to the problems of urinary incontinence in hospitalised and community dwelling patients.

About 5% of adults in the community and 27% of those over the age of 60 may experience problems with urinary continence. About 75,000 people are currently living in Australian nursing homes and almost 50% suffer from urinary incontinence. Urinary incontinence can often be managed by non-intrusive measures such as the use of incontinence pads or garments but for some patients an indwelling urinary catheter is required.

Patients discharged from acute or sub-acute care with a urinary catheter in situ require the coordinated support of a range of health professionals in both the hospital and community settings. The use of urinary catheters is associated with a number of risks and potential problems. Risks include urinary tract infection, bacteriuria, urosepsis and urethritis. Long-term use is associated with increased morbidity and mortality. Many patients experience practical problems such as leakage or accidental dislodgement of the catheter.

The literature on urinary catheterisation and local anecdotal evidence have suggested the need to develop a patient education programme and better communication tools that can be incorporated into the discharge planning process for patients in acute and sub-acute hospitals. The transition care project is designed to address the dual need for better patient education and closer communication and collaboration between hospital and community health professionals.

The first stage in the project was a survey of health professionals of the Alfred Hospital, Caulfield General Medical Centre and the Royal District Nursing Services accepting referrals from these two hospitals. Another survey targeted the patients and their carers using these services. These surveys were designed to identify the strengths and weaknesses of the existing provision and to inform the development of patient education materials and clinical support tools. The second stage of the project was the development of the education programme, best practice guidelines and the clinical support tools. A comprehensive patient information booklet on catheter care, a catheter discharge process sheet and a new catheter discharge form have been developed. The project team is now at the stage of rolling out the education package and the clinical tools. After these have been put in place the final stage of the project will be an evaluation of the educational package and the clinical support tools using focus groups and questionnaires.

This project is based on a close collaboration between the key stakeholders providing hospital and community services to the public in one specific area of Melbourne. However, it is anticipated the processes and resources developed can be adapted by other health agencies to meet the needs of their services. This project provides a good example of how university and clinical professions can work together to take advantage of a Federal initiative to carry out research that is of value to the local community and also adds to the clinical knowledge base of the practice professions.

Email contact details:
Colin.Torance@vu.edu.au

Research team:
Professor Colin Torrance
Principal Investigator
Associate Dean (Research and Development), Faculty of Human Development;

Greg Powell
Project Manager, Victoria University; and

Dr Alison Brookes
Caulfield General Medical Centre
Continence Service;

Associate Professor David Fonda
Dr Louise Dillon
Rachel Barton
Gail Miles
Philip DeRose
The University of Melbourne;

Janie Thompson,
Royal District Nursing Service; and

Luke Derriman,
The Alfred Hospital.
There is an increasing interest in long chain omega-3 polyunsaturated fatty acids (PUFA) eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), because studies have shown that these fatty acids can reduce the risk of coronary heart diseases, and lower the blood pressure and plasma triacylglycerol levels. In addition, omega-3 PUFA can improve inflammatory conditions such as rheumatoid arthritis, reduce the symptoms of diabetes and play an important role in the development of brain and retinal tissues in the fetus and infant.

Seafoods including fish, shellfish and other fish products such as fish eggs or oils are the main sources of omega-3 PUFA in our diet. The other source of omega-3 PUFA is alpha-linolenic acid, found in some vegetable oils such as canola oil, soybean oil, and in low amounts in baked beans and most green leafy vegetables. Research shows that the conversion of alpha-linolenic acid to EPA occurs in most people, but the process is slow and much less efficient than the direct incorporation of dietary EPA and DHA into tissues. It is suggested that eating fish two or three times per week will result in significant health benefits.

The contents of total lipid and omega-3 PUFA in seafood vary depending on several biological and environmental factors, such as species, diet of the animals, water temperature, and the latitude at which they were harvested. Although omega-3 PUFA content of Australian fish have been well studied there has been little research on shellfish, and most of the previous reports focused on the whole body mass of these species.

Research team:
Dr Xiao Su
Associate Professor Jack Antonas; and
Students: Hintsa Mateos Melanie Sullivan Thao Dinh
School of Biomedical Sciences.
This research involves, in the first step, the determination of omega-3 PUFA content of various types of seafood, particularly commercial shellfish species collected in different seasons and from different environments. To date we have analysed the omega-3 PUFA contents of several species including abalone, crabs, oysters and scallops. We have also compared the omega-3 PUFA contents of different edible organs/tissues and investigated the factors that could have caused changes in omega-3 PUFA concentration. Some results have been published in International journals and other preliminary results were presented at the Conference of Nutrition Society of Australia. Recently ABC Science Online has also reported our research findings. The results of this work will be used in future projects to improve the quality of farmed species by changing the diet and environmental conditions and this will consequently boost the health benefit of consuming this food group.

The project was partially funded by a seeding grant from Victoria University.

Email Contact Details:
xiao.su@vu.edu.au
Corporate governance has emerged as a major concern since the collapse of Enron; this is especially so in the People’s Republic of China where the corporatization and subsequent listing on international stock exchanges of companies formed out of old state owned enterprises has become a major goal of policy makers. The rise of these globally active Chinese companies is likely to have major international consequences.

This groundbreaking study is an empirically based analysis of approaches to corporate governance in the top 100 listed PRC companies; these companies were selected from the Fortune Magazine ranking of the top 100 stock exchange listed Chinese companies.

The researchers have undertaken face to face interviews with senior informants from within these companies, as well as with independent directors, corporate regulators and stock exchange officers. This has been an arduous process and a total of about 120 interviews are being undertaken in 2004 by Professors T omasic and Andrews (usually with a Chinese speaking team member).

These interviews have usually taken place in the offices of the corporation or regulatory body, although sometimes the interviews have taken place in hotels and cafes for a variety of sensitive reasons. Contrary to expectations, relatively little difficulty has been experienced in setting up and conducting these interviews. This may be attributable to the perceived importance of corporate governance as a topic as well as to a commitment to greater transparency that top 100 listed companies have assumed.

The project has explored the extent to which governance in the top 100 has been affected by having a dominant State shareholder who often owns around 80% of the company’s shares; such shares are usually non-tradeable. The protection of minority shareholders faces real challenges in this environment. This has seen the China Securities Regulatory Commission take measures to seek to enhance the corporate governance fabric of these companies (such as their disclosure practices, their use of independent directors and their handling of connected transactions).

Progress in moving away from old governance paradigms has been very slow. This has seen the continued existence of branches of the Chinese Communist Party within most of these companies (usually concerned with the operation of company’s manpower function). Nevertheless, a limited degree of convergence of corporate governance practices and structures is occurring in Chinese and non-Chinese companies listed on foreign exchanges. A major book is expected to be published from this research. The project has been funded by an Australian Research Council Discovery Grant.

Email contact:
Roman.Tomasic@vu.edu.au
Global economic law

Researcher:

Professor Christopher Arup
School of Law.

With globalisation more and more law has international implications. In this research project, the globalisation of economic law, we are mapping the law that regulates trade and investment, as this law reaches further ‘behind the border’ into economic, cultural and social realms once regarded as purely domestic.

The research combines traditional legal analysis with the theoretical insights and empirical investigations of socio-legal studies. (The researcher is now co-editor of an international series with Cambridge University Press, Studies in Law and Society). Each new agreement or treaty requires careful analysis and interpretation. But we find, in comparison with settled legal subjects, that the field is characterised by legal pluralism and ‘inter-legality’. Often the role of trade law is to regulate (in a distinctive way) the encounters between different national legalities, indeed a range of other legalities too. For example, the notion of the new lex mercatoria suggests that commercial parties make their own private law across national boundaries too, as well as participating in public law making.

At the same time, trade law is running alongside international law with other preoccupations such as security, environment and human rights. Most us know of the WTO now but what about WIPO, the Codex Alimentarius Commission, IOSCO or the Biodiversity Convention? Sources of law are often in competition. The participants seek to gain advantage, for example, by shifting between forums. But they also defer to and draw upon each other’s resources and work towards cooperation and coordination.

Ultimately, the best way to understand what is happening is case study. From here we can build schema of the relationships between sources of law. Because the legal phenomena are contemporary, the research often needs to go looking for clues within working documents, partisan commentaries and interviews with participants. Law making tends to be informal behind closed doors. It is better understood in its political and social contexts, where coalitions are formed, campaigns run, understandings reached, deals done and constituencies traded off.

Our research began with a study of the formulation of the new WTO agreements on intellectual property and services and their implications for law affecting three global issues: the supply of legal services, the ownership of genetic codes, and access to the on-line media. The results were published in a book with Cambridge University Press, which is being translated into Chinese at the moment, and will be going into a second English edition.

Now the research is trying to fit into the schema another source of law - the bilateral agreements exemplified by the FTA between Australia and the United States.

Intellectual property law remains a focus of this work. The regulation of ‘trade in legal services’ has also been a special interest, because encounters between foreign and local lawyers are a means themselves by which distinctive brands of law are internationalised. Investment is part of the new agenda.

As well as advancing theory, such research can help the participants decide how to act and react. For example, comparison of the regulation of foreign lawyers in Australia and in the PRC provides information for governments negotiating trade agreements and law firms seeking to supply services. It complements other research being done at the University. The strengths of the University’s new law school include comparative commercial law, international trade law, international dispute resolution and international corporate governance research.

Email contact details: Chris.Arup@vu.edu.au
Researchers from the Packaging and Polymer Research Unit within the School of Molecular Sciences, Victoria University, Werribee Campus, have developed plastic films containing antimicrobial agents derived from natural sources that curb the growth of a wide range of food spoiling micro-organisms. The new packaging films have the potential to gain widespread acceptance amongst consumers, who are constantly in search of natural solutions to everyday problems in preference to packaging systems that contain synthetic additives.

Pauwat Suppakul, a student from Thailand who was the recipient of an AusAID/Thai Government scholarship, developed the antimicrobial packaging films during the course of his PhD studies at Victoria University under the supervision of Associate Professor Stephen Bigger; Associate Professor Kees Sonneveld and Visiting Professor Joseph Miltz (Technion, Israel). The work has already gained much interest by the media as a result of its direct appeal to the imagination of the public.

Packaging films containing natural antimicrobial agents

Research team:

Associate Professor
Stephen W. Bigger
Head, School of Molecular Sciences;

Mr. Pauwat Suppakul; and
Associate Professor
Kees Sonneveld
Packaging and Polymer Research Unit; and

Professor Joseph Miltz
Packaging Laboratory, Technion, Israel.
Although antimicrobial plastic films have been used previously for the packaging of foodstuffs that are prone to spoilage by microorganisms, the novelty of the current work lies in the identification and use in plastic films of antimicrobial agents that have been derived from natural sources. In the case of the current research, the agents are extracts from the herb basil (*Ocimum basilicum L*). The challenge of the work has been to embed the active agent into the packaging film and to demonstrate its effectiveness against micro-organisms. For the incorporation of the natural agents, various methods have been explored and a great deal of effort has been placed in attempting to find the conditions for the production of films with optimized properties.

The antimicrobial films produced by the research team have shown much commercial promise in that they are effective against micro-organisms such as *E. coli*, which is often a cause of food poisoning, and *listeria*, which causes listeriosis - a disease that affects primarily pregnant women, newborns, and adults with weakened immune systems. Outbreaks of listeriosis have been connected to foods such as cheeses and some processed meats. The research team has performed preliminary tests on food samples packaged in the antimicrobial films and has obtained results suggesting that the films increase significantly the shelf life of the packaged product due to reduced growth of micro-organisms present on the food surface.

The research team is currently in the process of protecting the intellectual property of the invention and is also involved in discussions with a major international company with regard to collaboration towards further development of the technology with an ultimate aim of commercialization of “natural” antimicrobial packaging films.

**Email contact details:**
Stephen.Bigger@vu.edu.au

*The new packaging films have the potential to gain widespread acceptance amongst consumers who are constantly in search of natural solutions to everyday problems in preference to packaging systems that contain synthetic additives.*
The Business Events industry is an important contributor to the national economy. Estimates of the value of the industry range from $9 billion to $11 billion and it encompasses the meetings, conferences, exhibition and incentive sectors. The National Business Events Study, conducted by the Centre for Hospitality and Tourism Research on behalf of Sustainable Tourism Co-operative Research Centre, is one of the most comprehensive and ambitious studies undertaken on this important tourism industry. Key partners in the study were Tourism Australia, the Business Events Council of Australia, the Australian Association of Convention Bureau and Sustainable Tourism CRC, among others.

The main aim of the study was to determine the economic contribution of the Business Events industry. The study collected data from all components of the industry and from all states and territories within Australia. With over 7000 responses from conference delegates, almost 900 exhibitor responses and over 200 event organiser responses, the study is the largest collection of business tourism data within Australia.

In order to obtain delegate response, an incentive from Qantas of two business-class tickets to any Qantas destination in the world was offered. This prize was worth over $20,000 and the lucky winner was a PhD physics graduate who was about to begin a position at Cambridge University in England. Needless to say, the winner was extremely delighted.

Initial analysis has found that the Incentive Travel expenditure component alone is estimated at over $500 million. This important and increasingly larger component of Business Tourism is a focus for the peak tourism body in Australia, Tourism Australia. The information obtained from both this and the rest of the study will provide valuable data for the industry to inform government.

This study received over $250,000 from Sustainable Tourism CRC, Tourism Australia, the Australian Association of Convention Bureau, Gold Coast Convention Bureau, the Exhibition and Event Association of Australia and the Meetings Industry Association of Australia. The report will be launched in late 2004 and it is expected that the study will be replicated to ensure that the industry has timely, consistent and accurate information for future planning.

Email: Marg.Deery@vu.edu.au
Patrick Wolfe is conducting comparative cross-cultural historical research into some of the ways in which differences between human groups have been conceived and classified in colonial and postcolonial societies. Wolfe has coined the term ‘xenology’ for the phenomenon whereby all human groups seem to classify each other according to a variety of criteria. The xenology with which we are most familiar is the concept of race. Wolfe argues that race is not a natural characteristic but a distinctive taxonomy of human differences that only emerged in the eighteenth century in the context of European colonialism. Wolfe’s research aims to analyse a range of xenologies, including colonial doctrines of race, and to situate these classificatory schemes within the historical contexts that produced them.

The colonial and postcolonial societies that Wolfe’s research examines are Australia, the USA and Brazil. The research traces the development of racial concepts in relation to four colonised groupings in those societies: Aboriginal people in Australia, African Americans, Native Americans and Afro-Brazilians. Some major differences are immediately apparent. In particular, though Aboriginal people and African Americans are both classified ‘Black’, the discourses of race that Europeans have applied to them have been very different. This is particularly apparent where regulations concerning miscegenation have been concerned. Under the Australian policy of assimilation, Aboriginal people with any degree of White ancestry found their Aboriginality discredited in favour of their incorporation into White society. Where African Americans have been concerned, by contrast, the ‘one-drop rule’ has meant that any amount of Black ancestry slight, and regardless of phenotypical appearance, has resulted in an individual being classified Black. Wolfe attributes this striking disparity to the different colonial contexts – settler colonialism and slavery respectively – in which Europeans first encountered the two groups concerned. On this basis, his research moves on to examine the racialisation of Native Americans, who, like Aborigines, are a settler-colonised group. Striking similarities between the racialisation of Indigenous people in Australia and the USA emerge, even though Native Americans are not classified Black. Thus there is much more to race than physical attributes such as colour.

To extend the analysis, the research also takes in the racialisation of Afro-Brazilians, who have been subject to probably the most bewilderingly complex set of colour classifications ever devised (over 650 different categories and shades of pigmentation by one count). Brazil is not only more complex than Australia and the USA. It is also different in that the colonisers were Portuguese and Catholic rather than British and (predominantly) Protestant. Many other variables also apply. In the outcome, the research is intended to establish the basis for a cultural and historical typology of concepts of human difference.

Email contact details: Patrick.Wolfe@vu.edu.au
Mike McKenna was involved in three research projects in 2003. In the first, PhD student Kate Murphy and Associate Professor Mike McKenna from the Centre for Ageing, Rehabilitation, and Exercise Science (CARES) and School of Human Movement, Recreation and Performance conducted a study funded by a VU Discovery grant. The study investigated the effects of a bout of prolonged exercise on genes in muscle responsible for a key enzyme controlling sodium and potassium levels in the muscle, known as the “sodium, potassium pump”. It was found that these genes were activated by exercise, producing an increase in the biochemical trigger (messenger RNA) for synthesising new “sodium, potassium pumps” in muscle. This finding has important implications for understanding how these enzymes are controlled in muscles and contribute to understanding muscle fatigue. This knowledge may eventually be important in helping patients exhibiting low levels of this enzyme in their muscles (e.g., heart failure, kidney disease), which may in turn increase their capacity to undertake exercise.

In the second, PhD student Simon Sostaric, Masters student Xiaofei Gong, Postdoctoral Fellow Craig Goodman and Associate Professor Mike McKenna,
conducted a study during 2003 funded by NH&MRC. The study investigated the effects of the drug digoxin, which is used to increase heart function in heart failure patients, on muscle strength, endurance, fatigue and mechanisms of fatigue, in healthy young adults. We tested whether the drug made healthy people’s muscles weaker and fatigue more quickly. The study involved collaboration with staff from the Alfred, Austin, Royal Melbourne Hospitals, and from VU, Deakin and RMIT Universities. Subjects performed several types of exercise tests. Muscle strength and endurance were measured during leg kicking on a Cybex “isokinetic” (constant velocity) ergometer. Muscle fatigue was assessed using the forearm muscles performing finger curls, and during exercising on a cycle ergometer. Blood samples were taken from an artery in the wrist and from a vein in the arm, and small samples of muscle were taken from the thigh muscles. Preliminary results indicate that digoxin does not appear to affect strength but may make muscles fatigue more readily. The action of the drug is on a key enzyme controlling sodium and potassium levels in the muscle, known as the “sodium, potassium pump”. Analyses of tissue samples are continuing. The study has implications for understanding mechanisms of muscle fatigue and may lead to future studies into patients with heart failure taking this drug.

In the third study, PhD student Aaron Petersen and Associate Professor Mike McKenna (CARES) performed a study comparing exercise performance, muscle mass and muscle biochemistry, in patients with kidney failure against healthy control subjects. This study involved collaboration with staff from the Nephrology Department, Royal Melbourne Hospital and was funded by a pharmaceutical industry grant. The study aims to determine why these patients have a reduced exercise capacity and is continuing.

Email contact details: Michael.McKenna@vu.edu.au
The under-representation and poor retention of female students in computer science courses at Victoria University has been a particularly elusive issue. Computer science seems to offer one of the more attractive scenarios to potential female students – gender unbiased curriculum, attractive career path, and high salary scale. The success of past female graduates proves that females can, and have succeeded in this area. Why then, are the trends in the opposite direction? The situation in recent years has been particularly disturbing; participation rates dropped from an acceptable 30% in years 1993-96, to an alarmingly low and steady 18% in the following years; retention rates bottomed at 41% in 1997, and hovered between 54 and 65 per cent since. Over the years, a range of initiatives, focusing on the environment outside the classroom, have been undertaken to counter these negative trends, but to no avail.

This research project aimed at tackling the problem from a different, internal, perspective. The investigation focused on the classroom environment and sought to establish if the ‘disappearing act’ of female students from computer science could be attributed to gender bias in the classroom. Gender bias in the learning environment can manifest itself through inadequate pedagogical techniques, stereotypical attitudes of lecturers, tutors, and fellow students, as well as lack of role models and poor institutional support. The research investigated the existence of all these types of gender bias in the computer science courses. Firstly, a series of focus groups with both female and male students was conducted to identify gender equity problems faced by female students; secondly, a survey, designed using the results obtained from the focus groups, was administered to all undergraduate computing students.

The results of the research were surprising – it was discovered that gender bias in the computing classroom was not a contributing factor to female dropout rates. According to the students, an entrenched gender bias did not even exist in the computing learning environment! Gender equitable learning environment notwithstanding, the research revealed a number of different, transition related, problems that seem to impact negatively, particularly on female students, and identified the first semester of the course as the ‘make or break’ period. Consequently, new initiatives, such as an extended orientation program, have been introduced to assist new female students with their initial transition into the course.

The research has been funded by a HEEP grant, and a contribution from the School of Computer Science and Mathematics.

Email contact details: Iwona.Miliszewska@vu.edu.au
Most of our development occurs in the first 5 years of life, yet most of our social service spending goes to people in later stages of the life span. This is mainly because we spend on individual treatment plans, rather than on prevention of the social problems that can lead to individual problems and distress in later years. Even though early intervention and prevention are well known as best practice strategies, there is not enough research into best practice in running such programs. This project used an action research approach to work with a rural community on best practice in promoting wellbeing at the community level.

The program, Connect For Kids, took a multifaceted approach to the promotion of community wellbeing. This innovative three-year pilot program was based in Alexandra, in the Victorian Shire of Murrindini, and conducted through Berry Street Victoria, an organisation not wishing to be exclusively associated with welfare. The program aimed to connect and strengthen individuals and groups in the community, to support and enhance the capacities of families and to foster the development of positive school engagement and good educational outcomes.

Over the three-year period a range of projects taking a strengths-based approach to enhancing resilience and reducing risk were initiated in the community. One of the core projects established through Connect For Kids was the Early Learning is Fun (ELF)-Spread the Word project, which encouraged community-wide support for reading. This popular project involved children, parents, local schools and businesses in community-wide reading events. This project was recently featured on the ABC’s 7.30 report.

The Wellness Promotion Unit, School of Psychology, undertook an independent evaluation of the pilot program across the three years, which formally concluded in May this year. Our evaluation incorporated both qualitative and quantitative methods including individual and group interviews, surveys, development of program logic models, observation, and reflective practice.

In doing community work the all-encompassing day-to-day activity often takes precedence. The inclusion of regular opportunities for reflection on the linkages between project implementation and their intended outcomes was an important contribution of the evaluation of the Connect For Kids program. The key themes responsible for success of the program included:

- Flexibility of the program model;
- Emphasis on community capacity;
- Existence of a program champion(s);
- Formal opportunities for reflection and review;
- Development of networks and partnerships; and
- Emphasis on Sustainability (by building components into existing community structures).

Lyn Radford, an APAI PhD candidate within the School of Psychology, was a key member of the evaluation team. Connect For Kids formed the cornerstone of Lyn’s PhD case study, which focuses on the elements that are critical to effective implementation of early intervention programs.

As testament to the work done by all in this program, the foundation that granted the program initial funding agreed to maintain funding for a further three years and funded the spread of successful program elements to two nearby local communities, Yea and Seymour.

Email contact details:
Jenny.Sharples@vu.edu.au
Advance in turbulence measurements using Hot-Wire anemometer

Research team:

Dr Jun-De Li  
School of Architectural, Civil and Mechanical Engineering, Faculty of Science, Engineering and Technology;

Prof A J Smits  
Dr R Zhao  
Department of Mechanical and Aerospace Engineering, Princeton University; and

Dr J F Morrison  
Department of Aeronautics, Imperial College, London.

Hot wires have been used to measure turbulent gas flows for over sixty years. Most of the available data today on turbulence were taken by using hot wires. Although recent advances in laser technology have resulted in the development of Laser Doppler Velocimetry (LDV) and Particle Image Velocimetry (PIV), hot wires are still the preferred choice in most of the turbulence research laboratories and for engineering applications. During the last few years, there has been some close collaboration between Dr Li from Victoria University with researchers at Princeton University, USA and Imperial College, UK on developing new hot-wire calibration techniques and in advancing the understanding of the dynamic response of the hot wire.

A new crossed hot-wire calibration technology, based on pipe or channel flow, has been developed. Using the fact that the Reynolds shear stress is known analytically, there is no need to tilt the hot wire over many angles, as the existing calibration techniques required. In comparison with the existing procedures the new technique is easy to use, less time consuming, and more reliable in the turbulence results. The technique has been used successfully in making much awaited turbulence measurements at a high Reynolds number in the Superpipe facility at Princeton University.

One challenge in hot-wire technique is the understanding of its dynamic response to the time and spatial varying turbulent velocities. Because of this, only indirect frequency response of the hot wire can be determined using the square wave test. Also this lack of understanding has hampered the progress in resolving the spatial issue, which is paramount in accurate turbulence measurement and in understanding the small scale turbulence structures. Recently, Dr. Li has, for the first time, successfully derived the relationship of the hot-wire dynamic response. The relationship has been used to investigate the frequency response of the hot wire to turbulent velocity fluctuations. It is found that the actual cut-off frequency of a hot wire is much less that that given by the indirect method using square wave test, and the results are in remarkable agreement with the experimental results from the National University of Singapore. The relationship can also be used to investigate the spatial resolution problem of the hot wire analytically for the first time, and work in this direction is in progress.

Email contact details:  
Jun-De.Li@vu.edu.au

Research team:

Dr Jun-De Li  
School of Architectural, Civil and Mechanical Engineering, Faculty of Science, Engineering and Technology;

Prof A J Smits  
Dr R Zhao  
Department of Mechanical and Aerospace Engineering, Princeton University; and

Dr J F Morrison  
Department of Aeronautics, Imperial College, London.
Each year, growers in the Greater Melbourne metropolitan area, including Werribee South, produce 5000 tonnes of vegetables worth about $7 million at the farm gate. Their customers demand that the produce is clean and fresh – asparagus and broccoli must be firm and green and succulent. However, when vegetables are harvested warm they begin to deteriorate – pathogens destroy the texture and off-flavours develop. Their value falls and export markets disappear.

One way to avoid these problems is to cool the vegetables as quickly as possible after they have been harvested. Speed is of the essence, because vegetables can become even hotter if they are not cooled because they respire, rather like humans. As a result, heat, water and carbon dioxide are produced and sugars are consumed and the vegetables lose their flavour. Some growers do cool their produce by spraying it with refrigerated tap water, but the water is immediately discharged down drains or onto the land. Industry standards recommend that about 50 tonnes of water be used to cool one tonne of vegetables. Not only do many growers (and downstream processors) waste water, but they are also wasting lots of energy by throwing away refrigerated water.

To solve this problem the SmartWater fund has awarded Victoria University a grant of $100,000. The funds are used to support a team of University researchers who are working closely with industry partners and manufacturers to help growers to save water and energy. They have designed and built a device called a hydrocooler. In the system being developed, the water used to cool the vegetables has a water consumption as little as 100 kg (one-tenth of a tonne) per tonne of vegetables cooled. In other words the hydrocooler uses five hundred times less water than some of those used at present. The work is being undertaken in close collaboration with Mr Nick Christou, Chief Executive Officer of the Christou Group, and technical support is being provided by Mr William Bliss, a Director, of Wobelea Pty Ltd.

Not only does the new hydrocooler save water, it also saves energy. The energy required to cool one tonne of broccoli from 25oC to about 5oC is about 5 kWh as opposed to an energy consumption that is economically unjustifiable in a system in which the water is not re-cycled.

The project brings together university researchers, horticultural growers and manufacturers to protect the environment and to increase the economic prosperity of the Western Region of Melbourne.

Email contact: Graham.Thorpe@vu.edu.au
Outstanding research students

Gary Fryer  
*Victoria University, School of Health Sciences*

Gary is investigating the nature of paraspinal tissue texture abnormalities that are claimed to be an important aspect for osteopathic diagnosis of functional spinal disorders. Gary has completed two of his three proposed doctoral studies and has been very successful in generating peer-reviewed publications from this research. Publications include his two-part literature review, his first doctoral study, and one related review article. His second doctoral study is currently under review, and another related article has been accepted for publication. Gary presented his two doctoral studies to the International Conference for the Advancement of Osteopathic Research (ICAOR), hosted by Lake Erie College of Osteopathic Medicine, Pennsylvania, USA, in September 2004.

Gary was awarded the Best Researcher – Established Researcher prize at the end of this conference.

Paul Cribb  
*Victoria University, School of Biomedical Sciences; and Centre for Aging, Rehabilitation and Exercise Science (CARES)*

Paul Cribb, PhD Candidate at VU’s Exercise Metabolism Unit has completed research that received accolades by the American Physiological Society in 2003, and 2004. This research earned Paul the Young Investigator of the Year award by the Australian Association for Exercise and Sports Science (AAESS). His research showed certain dietary supplements (whey protein and creatine monohydrate) enhanced muscle mass and strength, while also promoting fat loss in adults undertaking resistance training exercise. This research has tremendous significance to Australia’s ageing population. A decline in lean body mass (muscle) is a common occurrence among apparently healthy older adults and research suggests that this phenomenon initiates many of the undesirable conditions that are associated with ageing.

Peter Sherwood  
*Victoria University, Centre for Hospitality and Tourism Research*

PhD scholar Peter Sherwood recently won the Poster Prize at the ATRI (Australian Tourism Research Institute) Conference in Townsville. Each year a competition is run in conjunction with the conference, and all Sustainable Tourism CRC PhD scholars are asked to submit a poster that outlines the significance of their research. His topic is The Development of an Holistic Evaluation of Special Events, which builds on previous research that has been undertaken by the Centre for Hospitality and Tourism Research and the Sustainable Tourism CRC. The prize is international travel for PhD research activity or attendance at an international conference.

Amanullah Maung  
*Victoria University, School of Electrical Engineering*

Due to significant changes in the power system industry, an information embedded power system is essential to accurately and effectively monitor, control and use telecommunication facilities. A flexible system is desired so that remote terminal unit (RTU) computers can record power system measurements and send them in real time over Local Area Network (LAN) and Wide Area Network (WAN) to the power control centre efficiently. This project aims to study the random characteristics of the WAN and how this can affect the accuracy of measurements sent from the RTUs to the control centre. Real time data from the power system will be taken and sent to the power utility control centre via WAN by using SPI PowerNet (a Victorian electrical transmission company) facilities. A computer model will be developed based on the experimental findings to overcome the significant propagation delay of data. Amanullah’s research received the Best General Energy Project Award, Australian Institute of Energy Post-Graduate Student Energy Award 2004, Australian Institute of Energy.

Roongfa Kitiyanusan  
*Joint Program between Victoria University and Burapha University, Thailand, School of Education*

Roongfa Kitiyanusan is the first student to submit her doctoral thesis from the Doctor of Education degree approved in 1998. She is also the first student from the offshore cohort of students who are part of a partnership between Burapha University and Victoria University. Ms Kitiyanusan has made outstanding progress through her degree, completing her thesis well within the designated time frame. Her topic, ‘Facilitating the questioning skills of student teachers through action research’, employs innovative methodology in Thai teacher education research. This research is significant as it develops a new paradigm for the pedagogy of teacher education and school classrooms in Thailand. The research is a direct response to the call to educational reform in Thailand and Ms Kitiyanusan will be well placed, informed and qualified to lead this reform in Thailand.

Lisa Mary Stevens  
*Victoria University, School of Psychology*

Lisa Steven’s thesis ‘Erotic Feelings in Sport Psychology Service Delivery’ explored an often avoided topic in sport psychology. She has done revolutionary work that will ultimately benefit the field and the clients served. Her thesis was awarded the highest mark in the history of coursework Master’s theses in the School of Psychology. The quality of her work was also instrumental in securing her a PhD scholarship in the School of Human Movement Recreation and Performance where she is now studying and expanding on the topic of her Master’s thesis. Elements of the research were presented at the AAASP conference in Tucson,
Developing countries on project work, where this approach is still very much in its infancy. Also Thuy-Huong has a number of papers accepted for presentation and publication.

Flossie Peitsch  
**Victoria University, School of Education**

Flossie Peitsch, a current PhD candidate has had her research piece ‘Wordhouse’ accepted in the Blake Prize for Religious Art, a most significant award, and The Blaue Touring Prize this year. She completed commissioned art for the Lutheran Church of Australia entitled ‘The Immortal Now’ and was also included in the Needham Prize for Religious Art. Flossie Peitsch is currently undertaking a 40 square metre Community Mural, a corporate commission for the Altona Meadows Shopping complex.

Craig Wallace, Harriet Radermacher and Tamara White  
**Victoria University, School of Psychology**

Community Psychology Masters students, Craig Wallace, Harriet Radermacher and Tamara White gave a joint presentation at the Community Psychology Conference in New Zealand, in June 2004 and won the prize for the best student presentation of the conference. Their presentation was called ‘Come see our butts!’ based on their ‘No Butts’ campaign as part of their Community Development Skills Masters subject with teacher, PhD student Julie Morsillo. Julie produced a video of their campaign that she introduced and showed at the conference. Craig, Harriet and Tamara involved the audience by handing out lollies and flyers on their environmental campaign to promote the issues of no littering of cigarette butts. They also included the voices of their fellow classmate campaigners by asking audience members to read short reflections from these class members, being: Christine Gunaratnam, Phil Head, Tymur Hussein and Christine McKersie. So an award winning action research project promotion!

Lisa Pizaro, Susan Khadem, Lara Fergus and Christine Gillespie  
**Victoria University, School of Communication Culture and Languages**

A panel of VU students won the award for the best presentation at the post-graduate Work in Progress conference at University of Queensland 25 and 26 September. The conference theme was ‘Thesis Topics as Bad Ideas’. Lisa Pizaro, second year student, Sussan Khadem, Lara Fergus and Christine Gillespie, all first year students, presented papers and read extracts from their creative writing. The title of their panel presentation was ‘Grey Matter and Pink Bits: Good Girls Writing Bad Ideas’. The students are doing creative writing theses, all novels, except for Lara who is producing a collection of short stories.

Lisa, Susan, Lara and Christine will be presenting papers as a panel at the AAWP conference in Adelaide in November 2004. The theme of the conference – run by the Australian Association for Writing Programs - is ‘The Practitioner’s Art: Juggling Roles’.

**Penny Weller**  
**Victoria University, School of Social Sciences**

Penny Weller graduated Doctor of Philosophy in 2003. The Examiners and supervisor commented very favourably congratulating Penny on an excellent thesis, for which she was commended for her work. Penny’s ‘genealogy of patient rights’, which explores the historical emergence of the patient as a subject with rights was rated well above the standard required for the award of a PhD.

In tracing medical discourses from the late nineteenth century, the study shows the patient with rights emerging around medical problematisations of noncompliant populations. The legacy of this discursive construction is to position the patient with rights as the pivotal technology in a new audit system designed to monitor professional conduct. In the light of the proliferation of rights discourse in neoliberal regimes, the study invites us to question the nature and consequences of rights in late modernity. Penny is now working at Victoria University on a sessional basis and has a half time lecturing position at the University of Melbourne.

**Emma Rybalka**  
**Victoria University, School of Biomedical Sciences; and Centre for Aging, Rehabilitation and Exercise Science (CARES)**

At the Australian Association for Exercise and Sport Science (AAESS) conference held in Brisbane in April, Emma Rybalka won the Young Investigators Award – Best Poster for her work titled ‘An improved method for the measurement of in vitro SR calcium uptake in skeletal muscle using Fura-2: Insights into fatigue mechanisms during exercise’. Posters were judged on originality, applicability of results and quality of research, presentation and project justification. Emma is a PhD student in the Exercise Metabolism Unit (School of Biomedical Sciences & Centre for Aging, Rehabilitation and Exercise Science (CARES)) under the supervision of Dr Alan Hayes.
Research activity in brief

Centre for Telecommunications and Micro-Electronics
Boosting Wireless Information Capacity

The Centre for Telecommunications and Micro-Electronics was established at Victoria University in late 2001. The Centre has very strong links with Government, industry and research centres, both nationally and internationally. It prides itself in selecting research projects that benefit industry as well as being academically challenging.

Research is concentrated in the areas of wireless communications and micro-electronics. The emphasis in wireless communications is on capacity enhancement of the air interface, including propagation measurement and modelling, algorithm development for high capacity modulation schemes, and radio terminal/base station design issues.

Micro-Electronics research activities concentrate on low power and low cost implementation of digital, RF and mixed-mode circuits using application specific integrated circuits (ASICs) and field programmable gate arrays (FPGAs).

Key Research Area of Social Diversity and Community Wellbeing
Building Community in Victoria

The Community Building Resource Service (CBRS) is a major State Government initiative funded by the Department of Victorian Communities. In 2003, the KRA was awarded 5 out of 7 components of the CBRS tender, which included the lead agency role. The component heads are Santina Bertone - WEPRU (Support Service Coordination and Development), Dr Jenny Sharples - WPU (Effective Practice Review of Information Practices), Robyn Broadbent - School of Education (Leadership Development and Mentoring) and Wayne Butson - TAFE (Skills Development and Training). The total income awarded from the CBRS is $640,000 over 2.5 years. The project is also consistent with the KRA’s strategic focus on community building initiatives and provides an informed basis for the University’s community engagement.

Centre for Hospitality and Tourism Research (CHTR)
Business Tourism

The National Business Events Study, conducted by the Centre for Hospitality and Tourism Research on behalf of Sustainable Tourism Co-operative Research Centre, is one of the most comprehensive and ambitious studies undertaken on this important tourism industry. Estimates of the value of the industry range from $9 billion to $11 billion and it encompasses the meetings, conferences, exhibition and incentive sectors. Key partners in the study were Tourism Australia, the Business Events Council of Australia, the Australian Association of Convention Bureau and Sustainable Tourism CRC, among others.

The main aim of the study was to determine the economic contribution of the Business Events industry. The study collected data from all components of the industry and from all states and territories within Australia. With over 7000 responses from conference delegates, almost 900 exhibitor responses and over 200 event organiser responses, the study is the largest collection of business tourism data within Australia. In order to obtain delegate response, an incentive of from Qantas of two business-class tickets to any Qantas destination in the world was offered. This prize was worth over $20,000 and the lucky winner was a PhD physics graduate who was about to begin a position at Cambridge University in England. Needless to say, the winner was extremely delighted.

Initial analysis has found that the Incentive Travel expenditure component alone is estimated at over $500 million. This important and increasingly larger component of Business Tourism is a focus for the peak tourism body in Australia, Tourism Australia. The information obtained from both this and the rest of the study will provide valuable data for the industry to inform government.

Centre for Environmental Safety and Risk Engineering (CESARE)
Recent Activities

- The Large Scale Experimental Building-Fire Facility at Fiskville, funded by a Systematic Infrastructure Initiative grant of $2 million and contributions from VU, Scientific Services Laboratories, OneSteel, BlueScope Steel and Boral has reached completion and the first fire test is currently under preparation.

- Funding was received from the ABCB (Australian Building Codes Board) for a significant research project involving the use of CESARE Risk to estimate the risk to life and property due to unwanted fires in multistorey apartment buildings. This project is nearing completion and will provide the first estimates of these risks to be obtained for a range of apartment building types, sizes and storey heights.

- Allied to the development and current use of CESARE Risk several research projects relating to the response to alarms, other sounds, and a fluctuating light (simulating a growing fire) of sleeping children and adults has been conducted with the School of Psychology of the Faculty of Arts with funding from an ARC Linkage Grant and OneSteel.
Centre for Ageing, Rehabilitation and Exercise Science (CARES)

Health and Wellbeing: Role of Physical Activity?

CARES continues to conduct many studies which focus on human health, well being and function. Associate Professor Michael McKenna is to be congratulated in gaining a prestigious NHMRC Project Grant examining exercise and fatigue. Dr Alan Hayes continues his work in the area of diet and performance with grants from the USA. Grant success in the areas of physical activity and community participation were won by Associate Professor Dennis Coleman and John Tower. Two successful ARC grants were won by Professor Tony Morris, and Associate Professor Mark Andersen, Dr Harriet Speed and Professor John Carlson for studies examining physical activity in older women and health practices in horse racing jockeys, respectively.

Applied research in the work place has seen grants from Toyota and P&O Ports to Professor John Carlson and Associate Professor Steve Selig, and Dr Con Hrysomallis was recognized for his research into balance and knee injuries in Australian Football.

Centre for Strategic Economic Studies (CSES)

How can we address climate change beyond Kyoto?

In a major research project funded by the ARC, Peter Sheehan, Sardar Islam and Matthew Clarke (CSES) are examining future economic influences on climate change and possible policy responses. The industry partners in the project are the Australian Greenhouse Office, the Business Council and the Department of Industry, Tourism and Resources.

In particular, the project is studying the impact of global structural change and the rise of the knowledge economy on greenhouse gas emissions. It is clear that global emissions are continuing to increase rapidly and will at least double between 2000 and 2030.

This will leave the world exposed to grave risks in terms of global warming, and more substantial policy responses than those involved in the Kyoto Protocol will be required. These responses must include the developing countries, while recognising their right to pursue economic development.

Centre for International Corporate Governance Research

Diversity and Governance

The Centre has exhibited a strong and diverse growth in 2003. The general contribution made by the Centre has been a useful combination of theory and practice. To the second year of our ARC grant, has been added work with two State government instrumentalities, hosting the national ethics conference, several books, numerous articles and conference papers, and a high level of activity in the associated research units. What became clear from that work was the use of governance in its widest sense, where topics as diverse as crime, the development of a national standard in Australia, and corporate governance in China were examined and developed.

Key Research Area of Integrated Food Value Chain

Project investigated ‘green’ food chains.

In a project funded by the Rural Industries Research and Development Corporation in the fresh food industries Professor John Cary, Associate Professor Suku Bhaskaran and Professor Michael Polonsky investigated the level of consumer demand for food produced according to codes of practice ensuring sustainable use of natural resources. Consumers had difficulty in identifying the ‘sustainably produced’ properties of food products. The meanings of the labels ‘sustainably produced’ and ‘environmentally friendly’ for food are confusing to consumers, in contrast to the label ‘organic’. The research will influence the development and elaboration of improved environmental management systems.
Research performance at a glance

Research outcomes as indicated by the publication of research findings have grown substantially in this period in each of the categories of Books, Chapters, Journal Articles and Conference Papers, and the total DEST points for publications shows a very pleasing increase.

The University has been successful in recording an increase in the amount of external funding for research over the six-year period. Total external research funding has more than doubled over this period, with the greatest increase being funds from the Austin Research Institute.

Research Student performance, as indicated by effective full-time student load, has also increased, most notably in the area of Professional Doctorates and for the PhD, while there has been a slight decline in the category of Masters by Research.

Research Student completions, for both Masters and Doctorates, have shown an increase in 2003 over the 1999 figures.
The University focuses its research activities, and strives for research excellence, in a number of areas where the University’s research strengths match the needs and interests of existing and potential external stakeholders. These areas, defined as programs associated with current University Research Centres, Faculty Centres, Key Research Areas (KRAs) and other major collaborations with Cooperative Research Centres (CRCs) and the Austin Research Institute, have been further refined to represent areas of international and national research strength, and of emerging strength. They are:

**STRATEGIC ECONOMIC STUDIES**
Centre for Strategic Economic Studies (CSES)
Director: Professor Peter Sheehan
Phone: 9919 1341
Fax: 9919 1350

**FIRE SAFETY AND RISK ENGINEERING**
Centre for Environmental Safety & Fire Risk Engineering (CESARE)
Director: Professor Ian Thomas
Phone: 9919 8033
Fax: 9919 8058

**AGEING, REHABILITATION, AND EXERCISE, SCIENCE**
Centre for Ageing Rehabilitation and Exercise Science (CARES)
Director: Professor John Carlson
Phone: 9919 4111
Fax: 9919 4539

**TOURISM AND HOSPITALITY**
Centre for Hospitality and Tourism Research (CHTR)
Director: Associate Professor Marg Deery
Phone: 9919 4626
Fax: 9919 5278
CRC - Sustainable Tourism
Contact Person: Professor Leo Jago

**TELECOMMUNICATIONS**
CRC - Australian Telecommunications
Contact Person: Professor Michael Faulkner
Phone: 9919 4254
Fax: 9919 4050

**CORPORATE GOVERNANCE**
Centre for International Corporate Governance Research Report
Director: Professor Anona Armstrong
Phone: 9919 1252
Fax: 9919 1064

**FOOD VALUE CHAIN**
KRA - Integrated Food Value Chain
Contact Person: Professor John Cary
Phone: 9919 8162
Fax: 9919 8135

**SOCIAL DIVERSITY AND COMMUNITY WELLBEING**
KRA - Social Diversity and Community Wellbeing
Contact Person: Associate Professor Danny Ben-Moshe
Phone: 9919 1424
Fax: 9919 1277
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Mission Australia
Mrs Fleur Spitzer
Murray Valley Citrus Board, Mildura
Museum of Victoria
National Archives of Australia
National Arthritis and Musculoskeletal Conditions Improvement Grants (NAMCIG)
National Electrical and Communications Association
National Health and Medical Research Council
National Heritage Trust
National Museum of Australia
National Stroke Foundation
National Road Transport Commission
NCI Packaging
Nelson Silso
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