UNDERGRADUATE RESEARCH NEWS AUSTRALIA

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ACUR | Australasian Conference of Undergraduate Research 2014

The Australasian Conference of Undergraduate Research, ACUR 2014, will be here before we know it.

Paula Newitt, Chair, ACUR 2014, Australian National University

The upcoming annual conference will be held this year at the **Australian National University, Canberra, Australia over 18/19 September 2014** and it is shaping up to be another exciting celebration of student research activity.

September in Canberra is a combination of crisp

early mornings with stunning blue skies leading to beautiful sunny days. Stay on after the conference and visit Floriade (http://www.floriadeaustralia.com) over the weekend or catch up on the nightlife (yes, it does exist!) before going to the inaugural Posters in Parliament event on Monday 22nd September (see article elsewhere in URNA).

The ACUR 2014 Conference Organising Committee is working to attract undergraduate student contributions (oral presentations or posters) from across the widest possible range of disciplines and from students representing all tertiary education institutions across Australia and New Zealand. Traditionally STEM disciplines and arts and social sciences are well represented in such conferences but ACUR **2014 is also keen to encourage students in, for example, music, arts, design, etc. to illustrate approaches to research in these and other disciplines.**

The ACUR 2014 Conference Organising Committee will guarantee two places for each institution so now is the time to encourage your students to participate or, if you are a student, to talk to your lecturers and education and research leaders about sponsorship to attend and participate in the conference. Of course, ACUR 2014 will be delighted to receive submissions from all interested and eligible students in addition to these guaranteed places. We hope that ACUR 2014 will be able to proudly proclaim the value and inspiration embedded in undergraduate research experiences in institutions right across Australasia. Don't let your institution be the one that is absent!

The program for the conference will continue to be updated on the conference website (www.acur.org.au) over the next couple of months. In brief though, the conference will be held over **18/19 September 2014 with a registration fee of $125**. The fee will cover both days of the conference and the social event on the evening of Thursday 18th September.

some of the prize winners from ACUR 2013

There will be a conference session designed for staff in the morning of Friday 18th September.

Conference registration is now open and submission of abstracts will open from Monday 2nd June 2014. The deadline for submissions is the 1st July. A team of academic staff, graduate and undergraduate students will review abstracts and provide feedback to authors. Authors will be advised by 21st July whether their submission has been accepted as a presentation or as a poster.

ACUR 2014 is delighted to advise that prizes will again be awarded in recognition of outstanding student contributions. These include a $1000 prize for the Best Presentation and Paper (donated by Professor Adrian Lee) and a $500 prize for the Best Poster (donated by the Higher Education Research and Development Society of Australasia, HERDSA).

ACUR 2014 welcomes donations and suggestions for sponsorship to ensure the conference will be an inspiring experience for all participants and to enable student attendance.

Please contact us at ACUR@mq.edu.au regarding sponsorship or donations or queries about Posters in Parliament

Looking forward to meeting you at ACUR 2014!

MACQUARIE UNIVERSITY | LEARNING AND TEACHING CENTRE

Undergraduate Research News Australia is produced in the Learning and Teaching Centre at Macquarie University

How to wake up the government to undergraduate research!

Angela Brew and Lilia Mantai, Macquarie University

Recent developments in the media and the Australian federal budget give no cause to be enthusiastic about higher education in the future. Yet in most institutions in Australia and New Zealand, wonderful research work is being done by undergraduate students as part of their coursework or in the growing number of research internships and scholarships now available to them. Students are increasingly demanding a higher education that prepares them for the kind of challenges that they encounter when taking on a research project: the challenges of investigation, of making judgements about observed phenomena; the challenge of making decisions in the face of incomplete evidence; the challenges of teamwork and collaboration and of writing. In other words, the challenges they will face no matter what profession they follow after graduation. In short, the challenges of discovery!

Higher education tends to be presented in the media as a cost to society, not as an enrichment of society. So how can politicians, the media and society be woken up to the excellent work that students are doing?

The answer is an event called Posters in Parliament. This is an exhibition and celebration of undergraduate student research to be held in the Mural Hall of Parliament House, Canberra on 22nd September 2014. It is organised to coordinate with the ACUR conference and is scheduled during a parliamentary sitting date to enable the maximum number of MPs to attend as well as key higher education leaders. Students will be asked to explain their posters to interested individuals and groups.

Posters in Parliament will raise the profile of undergraduate research nationally through the publicity it will generate as well as the event itself. The exhibition mirrors developments internationally in presenting high quality undergraduate research to members of parliament, e.g. Posters on the Hill is held in the US Congress annually and 'Posters in Parliament' has been held in the UK as a way of raising its profile, attracting publicity and support at a national level.

Students will submit ABSTRACTS to the ACUR 2014 Conference Committee (see www.acur.org.au for how to do this). Deadline for submissions is 1st July. After students have been notified that their abstracts have been acceptewd they will prepare posters for the conference. Each institution will then choose the best poster from among those submitted by their students to form the Posters in Parliament exhibition. Posters in Parliament 2014 is funded by the Office of Learning and Teaching and Macquarie University. If you would like to know more, find out how you can be involved or provide financial support for students to attend, please contact us on ACUR@mq.edu.au

UK Posters in Parliament 2014

Introducing ACUR: The organisation for Australasian Conferences of Undergraduate Research

Angela Brew, Macquarie University

ACUR has been established to ensure that an Australasian Conference of Undergraduate Research is held each year in different universities on an ongoing basis. ACUR aims to build on the highly successful Australasian Undergraduate Research Conferences convened in 2012 and 2013 at Macquarie University. You can find a snapshot of these events at http://www.mq.edu.au/ltc/altc/ug_research/events.htm. The next conference will be held at the Australian National University, Canberra on 18th-19th September 2014 (see above). ACUR also plans to hold a Posters in Parliament exhibition of undergraduate students' research work from time to time. Further details of this are also above.

ACUR has been established through SEED project funding from the Office for Learning and Teaching (OLT). The project team is led by Professor Angela Brew (Macquarie University); Associate Professor Jenna Mead (University of Western Australia); Dr Paula Newitt (Australian National University); Professor Rachel Spronken-Smith (University of Otago, NZ) and Professor Stuart Hampton-Reeves (University of Central Lancaster, UK).

The team has established an International Steering Group consisting of individuals who have influence in their institutions in terms of gaining support for undergraduates to attend and present at ACUR conferences as well as individuals who are researching or leading significant projects to engage undergraduates in research and inquiry. Currently, 28 Australian and 4 New Zealand universities are represented on the Steering Group as well as 13 other organisations and universities worldwide. This Steering Group will be the main decision-making body in respect of future Australasian Undergraduate Research Conferences.

The Steering Group led by the project team has been working to establish criteria and guidelines for conferences, and calling for expressions of interest for future conferences. The Steering Group will responsible for making decisions about hosting, providing guidance to conference hosts, ensuring the quality of conferences, assisting conference hosts in gaining sponsorship and in publicising ACUR. Steering Group members are also spreading information throughout their respective institutions. The group communicates through electronic means but may meet at conferences. Its documentation and a list of Steering Group members will shortly be available on the ACUR website at www.ACUR.org.au

Merit Scholars Research Scholarships

Clare Larandine, Macquarie University

The number of Undergraduate Research Scholarships offered at Macquarie University has grown every year and this year the Macquarie Merit Scholars Program expanded its offering of research scholarships to now also include twelve $2600 tax free Merit Scholar Research Scholarships. These scholarships were offered exclusively to Merit Scholars and holders will also receive funding to cover travel costs associated with attending the Australasian Conference of Undergraduate Research.

The Merit Scholars Research Scholarships provide opportunities for Macquarie's highest achieving undergraduates to gain experience as a researcher working alongside academics and contributing to the research of the university. The Scholarships are designed to enable Merit Scholars to share in building the intellectual climate of Macquarie University. Many of these top students have an interest in undertaking higher degree research or are simply very passionate about their area of study.

At the beginning of the year each Faculty was asked to nominate projects that would like to take on an undergraduate researcher. Merit Scholars were able to apply for any number of projects that they were interested in, including those outside their own Facultyor field of study.

continued over . . .

Macquarie University hosted the launch of the "Opening Real Science" initiative.

Second year Bachelor of Arts with Bachelor of Education (Primary) Merit Scholar Katherine Broadway secured a scholarship to work on the "Opening real science: Authentic mathematics and science education for Australia" initiative which has $2.3 million in funding from the Australian Government through the Office for Learning and Teaching.

Katherine said: *"The opportunity to work on the Opening Real Science project is proving to be even better than I dreamed it would be. Initially I thought my role as a research assistant would probably involve doing the tasks that no one else really wanted to do. Instead I am being offered the opportunity to develop and demonstrate skills in report writing and research instrument design with the goal of becoming published. My supervisor Associate Professor, Joanne Mulligan, is keen to make sure I receive as much mutual benefit from my placement as possible. I could not be more grateful for the opportunity to work on such an exciting project with such a passionate team."*

Dr Kevin Brooks from the Department of Psychology is working with third year Bachelor of Psychology (Honours) student Daniel Sturman on his project "Perception and Neural Coding of Race".

Dr Brooks said *"For me, it is one of the genuine*

pleasures of academic life to mentor a gifted and engaged student. If I ever find my enthusiasm waning, it is immediately reignited by young researchers with inquisitive minds, who can often provide a fresh perspective to an established line of research. The Merit Scholars Research Scholarship initiative allows me this benefit alongside the chance to accomplish tasks that I would otherwise scarcely have time for, allowing projects to flourish where they might otherwise have faltered. Add to that the value of being able to pass on research skills to the next generation of scientists, and you have a scheme of great benefit to staff and students alike."

Merit Scholar student Belinda Kwok (second from right) and her supervisor Dr Kimiko Tsukada with visiting academics from Colgate University, USA at a Macquarie University Faculty of Arts Visiting Research Fellowship sponsored workshop.

Bachelor of Speech and Hearing Sciences Merit Scholar Belinda Kwok is looking forward to starting her Masters of Clinical Audiology program in 2015. Currently in her final year of undergraduate study Belinda has secured a scholarship to research how speakers from different language backgrounds perceive speech sounds. The results will be useful for improving our current understanding of speech communication and have implications for foreign language pedagogy.

The Merit Scholar Research Scholarships initiative has been warmly welcomed by students and academic staff alike. One academic staff member described the initiative as "a genuine pathway for our best students to engage with cutting edge research".

The Macquarie Merit Scholars Program offers a wide range and volume of exclusive opportunities and experiences for Macquarie University's highest achieving undergraduate students. The program includes workshops, research scholarships, social and networking events, academic mentoring and international travel opportunities.

Our aim is to help Merit Scholars to develop into well-rounded students who have the greatest chance of success following graduation.

Supporting the development of undergraduate identity in research-led education

Dierdre Pearce and Simon Mulvaney, Student Experience and Transition Team, Division of Student Services, Australian National University

We're exploring ways of supporting students as they develop a research identity during their years as undergraduate students at the Australian National University. While many students come to ANU intent on engaging in research as early as possible, many are unsure of what this entails in practice, particularly within the apparent confines of an undergraduate degree program. Is research only available in later year courses, or in research-intensive programs? Is it relevant to students who don't intend to continue to postgraduate study? How do students identify research opportunities in course outlines and what benefits does research bring to a students' university experience?

The Undergraduate Researcher is a new publication that is part of our strategy for exploring undergraduate research identity and making undergraduate research activities more visible. Published online, its format is closer to a blog than a static webpage and its tone is closer to a magazine than a promotional brochure. It intends to create a sense of an undergraduate research community, focusing on profiles of students' research experiences, tips, better access to research opportunities, and ways of engaging in the intellectual life of the university community.

From the beginning the Undergraduate Researcher is intended to have a strong student voice and students have been central to the publication since it was launched in March 2014. For example, we focus on research opportunities in undergraduate courses through interviews of students and their lecturers by student reporters and have scheduled conference reports written by students returning from conferences during the year. Besides these we're drawing together the research-

Dr Mary Kilcline-Cody . Photo courtesy: ANU Media

related awards, conferences and other opportunities that can be difficult to keep track of. Another series of articles promotes 'Brain Food'; these mostly consist of co-curricular events and activities organised by student groups that engage with issues, ideas, creativity or other contributions to the wider university culture. Most are open to both staff and students and encourage greater informal interactions outside the lecture theatre.

To finish this short article, we'd like to give you a taste of the ***Undergraduate Researcher***. Here is a copy of an article written by Simon, who is a third year student enrolled in a B. Interdisciplinary Studies when not acting as roving reporter. First published on the 27th of March this year, the article is the result of interviews he conducted with a student and a staff member involved in the Vice-Chancellor's course ***Creating Knowledge***.

Dr Mary Kilcline Cody is an historian of Southeast Asia and an inaugural Tuckwell Fellow. In her office in the College of Asia and the Pacific, there's classical music and a tea-set and you'll be startled by a large cockatoo and two parrots clawing for food at the window. Mary is an historian who writes poetry, a linguist and a former bureaucrat who likes music and painting, and an academic innovator who developed the equally eclectic Vice Chancellor's Creating Knowledge course.

So what's special about ***Creating Knowledge?*** Well, something amazing happens when you bring students and researchers together. So far, CK students have produced some really innovative work. Some have researched and published their assignments, created and performed an overture, painted a landscape, designed and produced a management manual, created teaching materials for secondary school students, written poems, a graphic novel, and so much more.

Past student Victoria Pilbeam was even part of a group to "perform a rap in class to the tune of *Ridin' Dirty*. Then we got together and made a *Youtube* video of it. We felt really supported by our lecturer/tutor and classmates to just put ourselves out there and do it."

It's all about seeing things from new perspectives and then backing yourself to have a go. Mary says: "I want to create an environment where students gain the confidence to pursue what interests them." That's the basis for creative, innovative research.

Victoria Pilbeam. Photo courtesy: Victoria Pilbeam

If you would like to know more about the Undergraduate Researcher
or other co-curricular strategies we're developing to support undergraduate research at ANU
please contact us through set@anu.edu.au.

Undergraduate Research Support in Macquarie University's Psychology Department

Kevin Brooks, Macquarie University

Macquarie University's Psychology Department has a proud history of support for undergraduate research amongst its substantial cohort, and in recent years has introduced several schemes aimed at providing opportunities for committed students to gain experience and training in scientific research. Perhaps the most successful of these is the highly successful Psychology Research Internship Scheme, which established a model that is now being emulated across the university. In 2009, the Department committed substantial funding to this initiative, allowing interested undergraduate students to engage in a research project under the guidance of a staff mentor.

This scheme is competitive from the perspective both of the student and of the staff mentor. Interested staff members submit research proposals, including a description of the project, the duties involved, a timetable for the work, and the

expected learning outcomes for the student. The departmental research committee is tasked with assessing these proposals for their suitability for undergraduate involvement, with members of staff who have not recently been involved in the scheme given preference. Students are invited to apply for an internship with the list of approved projects in mind, and the ability to specify their preferred project. The applications of eligible applicants are given to successful staff applicants, who make their selections and arrange a meeting to begin the mentoring process, which will involve between 50 and 100 hours of paid work. Now in its 6th year, this initiative has continued to be highly popular with staff and students alike. The scheme attracts a large number of applicants and feedback from both interns and their mentors indicates positive outcomes for all.

Macquarie Psychology Interns have been well represented at the Australian Conference of Undergraduate Research (ACUR), unanimously acknowledging the benefit of the experience, and citing its value in encouraging them to pursue further research opportunities such as Masters and PhD studies. As ACUR has been a "home" event for Macquarie undergrads in 2012 and 2013, students needed only encouragement (not to mention plenty of hard work) to attend the conference. However, 2014 sees ACUR mature as an annual event, beginning its journey around Australasia with a move to ANU in Canberra.

In an effort to encourage continued patronage by students from Macquarie's Psychology Department despite the increased costs associated with inter-state travel, this year we are proud to announce the creation of a number of travel bursaries to support student delegates. The Psychology Undergraduate Conference Travel Scheme (PUCTS) provides grants of up to $500 on a competitive basis, helping to cover registration fees, travel costs and accommodation expenses. Applicants need to have confirmed acceptance of their submitted abstract, and the support of their supervisor to be eligible. The application process also serves a function as training in the process of grant writing, as the applicant is required to specify a budget for their costs, and to justify their request in terms of the anticipated benefits of ACUR attendance.

At a time when funds are continually being squeezed, schemes such as these may appear to be easy targets for cuts. Yet given their high educational benefit, their value to staff and their potential to encourage enrolment in postgraduate programmes, they represent excellent value for money. In these respects they have been extraordinarily successful for Macquarie University's Department of Psychology, and we would heartily encourage other departments, faculties and universities to offer similar opportunities to students and staff.

Undergraduate Research into Lymphoma Associated Hypercalcaemia

Andrea Coster, Kathryn Knights & Kate Roberts, James Cook University

James Cook University has developed a reputation as one of Australia's leading tropical research universities through its ability to establish proficient skills and knowledge in its research candidates. As part of the course requirements for the Bachelor of Veterinary Science at James Cook University Townsville, undergraduate students are expected to develop skills in undertaking research, critically evaluating current literature and analysing and interpreting data. At the beginning of their third year of study, veterinary science students are required to formulate a paper-based research model. This opportunity provides students with fundamental skills in research planning and proposal whilst allowing them to contribute to new and exciting areas in their chosen field of study. Professional development and mentor-based group work form the basis of the research proposal with students working in small groups of 5-6 individuals and assigned an independent supervisor.

As students with a keen interest in small animal clinical medicine we were instantly attracted to the topic of hypercalcaemia in lymphoma dogs. Hypercalcaemia of malignancy in the domestic dog is a common occurrence observed in veterinary clinics worldwide. Knowledge of this topic however, has not being extensively collaborated to develop useful practical implementation. Neoplasia, and in particular lymphoma is recognised as the principle cause of hypercalcaemia in dogs. The causation of hypercalcaemia includes a number of pathological disorders including hypoadrenocorticism, primary hyperparathyroidism, renal failure, granulomatous diseases, vitamin D intoxication, and non-malignant skeletal lesions. With this knowledge we can fully investigate cases of hypercalcaemia and the implications for animal health and treatment protocols.

A review of existing literature in this field uncovered dispersed information pertaining to the effect of different parameters relating to hypercalcaemia and their association with lymphoma in dogs. A comprehensive survey of the research spectrum was instigated and research was conducted in areas such as physiology of calcium metabolism and homeostasis, measuring calcium levels in the domestic dog, techniques on lymphoma diagnosis and staging, and typing of lymphoma using immunophenotyping. In several studies conducted by Elliott, Dobson & Dunn (1991), Bienzle, Jacobs & Lumsden (1993) and Uehlinger, Glaus & Hauser (1998) a causative link was recognised between hypercalcaemia and lymphoma, with neoplasia being associated in 50% of hypercalcaemia patients. Further research completed by Messinger, Windham & Ward (2009) indicated that in dogs diagnosed with hypercalcaemia of malignancy, 78% were specifically diagnosed with lymphoma. Studies correlating hypercalcaemia with malignancy by Rosol and Capen (2000) agreed that there was an association between an increased ionized

calcium concentration in serum and the percentage of animals diagnosed with lymphoma with approximately 20-40% of dogs found to have lymphoma being hypercalcaemic. Weir, Norrdin and Matus (1968) hypothesised that tumour production of parathyroid hormone related peptide causes osteoclastic resorption in bones thus resulting in hypercalcaemia of malignancy.

Guided by the gaps in current research we formulated an experiment which would evaluate all the aspects of hypercalcaemia of malignancy to provide a more complete study. The aim of our study was to examine parameters such as the plasma concentrations of total calcium, ionised calcium, albumin, parathyroid hormone and parathyroid hormone-related peptide in dogs with lymphoma. The study would utilise immunophenotyping to identify the lineage of lymphoma cells as either B cell or T cell type. Results generated will allow further characterisation of calcium metabolism as well as providing practical insight towards the clinical treatment of hypercalcaemia in dogs with lymphoma.

Once the intended parameters of examination had been identified, we would then begin to formulate the practical requirements of conducting the proposed research. Objectives, materials and methods as well at biosafety and ethical concerns were investigated and propositioned. Although time constraints of the degree curriculum made it impractical to undertake the experiment and generate results, expected results were calculated via the extrapolation of collaborated data from previous studies.

Completing this research proposal has opened our eyes to the vast possibilities available to graduates with a degree in Veterinary Science. Being a qualified veterinarian does not mean you are limited solely to the confinements of practicing clinical medicine. This degree instead aims to provide a foundation through which graduates can make significant contributions to their professional field in a multitude of outlets. The research component of the course prepares James Cook University graduates with the expertise and ability to conduct research in their chosen field as well as the intellectual curiosity required for sustainable development of their careers and the communities in which they practise. These skills are fundamental to facing and conquering the upcoming challenges facing northern Australia and the tropics world-wide.

Acknowledgements

Research Supervisor, Dr. Dilini Thilakaratne for her input and guidance in carrying out this research proposal.

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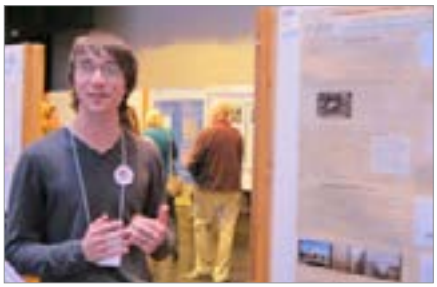
Overseas News

Students Practice Several Means of Communicating About Science

Carol Bender, University Distinguished Outreach Professor; Director, Undergraduate Biology Research Program, The University of Arizona

Learning to communicate about science to both scientists and to members of the public is an essential skill for STEM researchers. Thus, in the Undergraduate Biology Research Program (UBRP) at the University of Arizona (UA) we provide a variety of opportunities for undergraduate researchers to practice their communication skills.

At UBRP orientation students are involved in discussions about how research is funded and about how government and politics impact science, education and health care. Through these discussions students begin to understand that part of being a STEM professional includes being able to communicate findings in a variety of venues to a wide range of audiences. Representatives from the University's State and Federal Relations Offices meet with the students to describe current funding issues and legislation that impacts the research that takes place at UA. In addition, a reporter from the local paper gives a presentation on what goes into a press release because at the end of each summer, students are required to write a press release about the research in which they have been involved, and these are sent to, and often published in, their hometown paper.



Undergraduate Austin Brown explains his work on the effects of fungicide on honeybee health.

During the summer, students meet in bi-weekly in small groups, co-led by postdocs or graduate students, to learn to explain their research to their peers. They discuss and practice making power point presentations and posters. Each student presents a poster of his/her experimental results at the annual UBRP Conference. The Conference is attended by scientists, representatives of local biotech companies, university administrators, students' friends and family members, and prospective applicants to UA and to UBRP. Typically the conference includes more than 115 posters and is attended by more than 400 people. Once students have presented on campus they are encouraged to present their work at scientific conferences around the country. Many have presented their work at conferences such as the American Association for the Advancement of Science, the Experimental Biology Meeting, the American Chemical Society Meeting, and the Society for Neuroscience Meeting.

Catch up with Professor Carol Bender at Macquarie University on 16th September where she will be giving a talk as part of Learning and Teaching Week or at ACUR 2014 ANU Canberra

The First UK Politics/ International Relations Undergraduate Research Conference

Alison Statham, Chris Goldsmith, Mette Wiggen and Simon Lightfoot, De Montfort University UK

The First UK Politics/International Relations Undergraduate Research Conference took place on 2nd April at De Montfort University, Leicester. 16 students from 9 different universities gave presentations based upon research they had undertaken as part of their degrees, mainly their dissertations. Topics ranged from an evaluation of the work of Bernard Stiegler through a study of the global regulation of conflict diamonds to an investigation of the Statecraft of the British Coalition Government. The students displayed an impressive command of their subject, especially in dealing with questions from the audience. Having spent a number of months researching an area, the general feeling was that they valued the opportunity to discuss their work and engage with students from other departments across the country. Thanks go to the UK Political Studies Association and the Department of Politics and Public Policy for their support of the event, which we hope can become a regular event.

Politics/international relations undergraduate research conference in progress

Undergraduate research and inquiry in college-based higher education

Mick Healey, Alan Jenkins and John Lea

Healey HE Consultants, UK; Oxford Brookes University, UK; Canterbury Christ Church University, UK

Most attention has focused on how best to engage students in research and inquiry in the university sector. However, there is also a significant amount of this activity occurring in the college-based higher education (CBHE) sector. The CBHE sector is diverse and includes higher education programs run by technical and further education institutions (TAFEs) in Australia, polytechnics in New Zealand, further education colleges in the UK, institutes of technology in Ireland, and community colleges in Canada and the United States.

We recently completed a project for the UK Higher Education Academy on Developing research-based curricula in college-based higher education (Healey, Jenkins and Lea, 2014). As part of that project we collected 60 case studies from seven different countries. One of our main findings is that despite major differences in institutional mission there are many similarities in the ways in which CBHE and universities engage their undergraduate students in research and inquiry. For example, at North Melbourne Institute of TAFE, students in the Bachelor of Education (Early Years) experience all four approaches to engaging with research (research-led, oriented, based and tutored) identified by Healey (2005) (case study 1).

Case study 1: Building a research identity in the Bachelor of Education (Early Years) at Northern Melbourne Institute of TAFE, Australia [1]

Students are introduced to research skills in year one. Subsequently, in the four-year programme students are introduced to research-led and research-oriented teaching and learning. Students are required to participate in critical reading and discussion of research literature. They are engaged in learning activities that require them to undertake problem posing, that is, generating a research question, data collection techniques – specifically those based on observation – and building their capacity to interpret data from a range of theoretical perspectives. In the third year of the program, research-based activity is introduced to students as they develop and implement a self-reflective action-oriented research project based on their allocated teaching practice placements. In the fourth year of the program, students are supervised to conduct a research project and prepare a research report discussing the processes used and their findings.

[1] Sources: correspondence with Karina Davis (karinadavis@nmit.edu.au) and Christine Spratt (christinespratt@nmit.edu.au); http//www.nmit.edu.au/courses/bachelor_of_education_(early_years)

Variants from the traditional project form are already quite common in the CBHE sector. Many use group rather than individual projects and many are linked to employment or community-based learning opportunities. For example, in the final-year marketing project at Letterkenny Institute of Technology Ireland, students work in groups to address a research problem identified by a local business. The work is split over two long modules: in the first the students have to design a research proposal, and in the second they revise it in the light of feedback and carry out the research. Similarly in New Zealand, the Bay of Plenty Polytechnic has strong connections with local industry and national bodies and wherever possible the diploma in Engineering projects are guided by jointly developed proposals which address real-world workplace issues (case study 2).

Case study 2: Students undertaking diploma in engineering analyse mechanical or electrical engineering design problems and identify possible solutions in final project at Bay of Plenty Polytechnic, New Zealand [2]

Undergraduate students completing the second year of a polytechnic diploma are required to undertake a semester-long research project as a culmination of their learning. Students research existing solutions, create and trial variants or innovations, then record, assess and refine their processes. Bay of Plenty Polytechnic has strong connections with local industry and national bodies; wherever possible, the projects are guided by jointly developed proposals which address real-world workplace issues. Assessment is a collaboration between the sponsor organisation and teaching staff. As well as research and practical skills, students learn about project management and liaison between stakeholders, and enhance their verbal and written communication skills. For some, the introduction to an industry organisation has led to employment and on-going opportunities.

[2] Sources: correspondence with Uli Fuerst (uli.fuerst@boppoly.ac.nz) and Mark Hendry (mark.hendry@boppoly.ac.nz); https://www.boppoly.ac.nz/go/programmes-and-courses/electrotechnology-electrical/new-zealand-diploma-in-engineering-electrical

Within the CBHE sector most attention has been focused on increasing the amount of research and scholarship undertaken by the colleges and developing the capacity of their teaching staff to engage in these activities. Our belief is that to enhance the quality of student learning much more attention needs to be given to how best to engage the students in research and inquiry. We also argue that this approach and the practices in CBHE have implications for debates concerning the research-teaching nexus in the 'mainstream' university sector.

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Upcoming Events

Third Conference of Undergraduate Research, Australian National University, Canberra. 18-19 September 2014. Further information www.ACUR.org.au

Posters in Parliament: An exhibition and celebration of undergraduate research.22nd September 2014. Parliament House Canberra.

LiHE 2014 symposium on LEARNING TO RESEARCH - RESEARCHING TO LEARN at the beautiful Monastery in the Wine Region of Adelaide, Australia. All accepted participants get their research published worldwide by Libri Publishing Ltd.Enquiries: lihesupport@gmail.com. Web address: http://lihe.info Sponsored by: LiHE (International Academic Association for the Advancement of Learning-Centred Higher Education)

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Please let us know if you would like to join our extended network of interested people.
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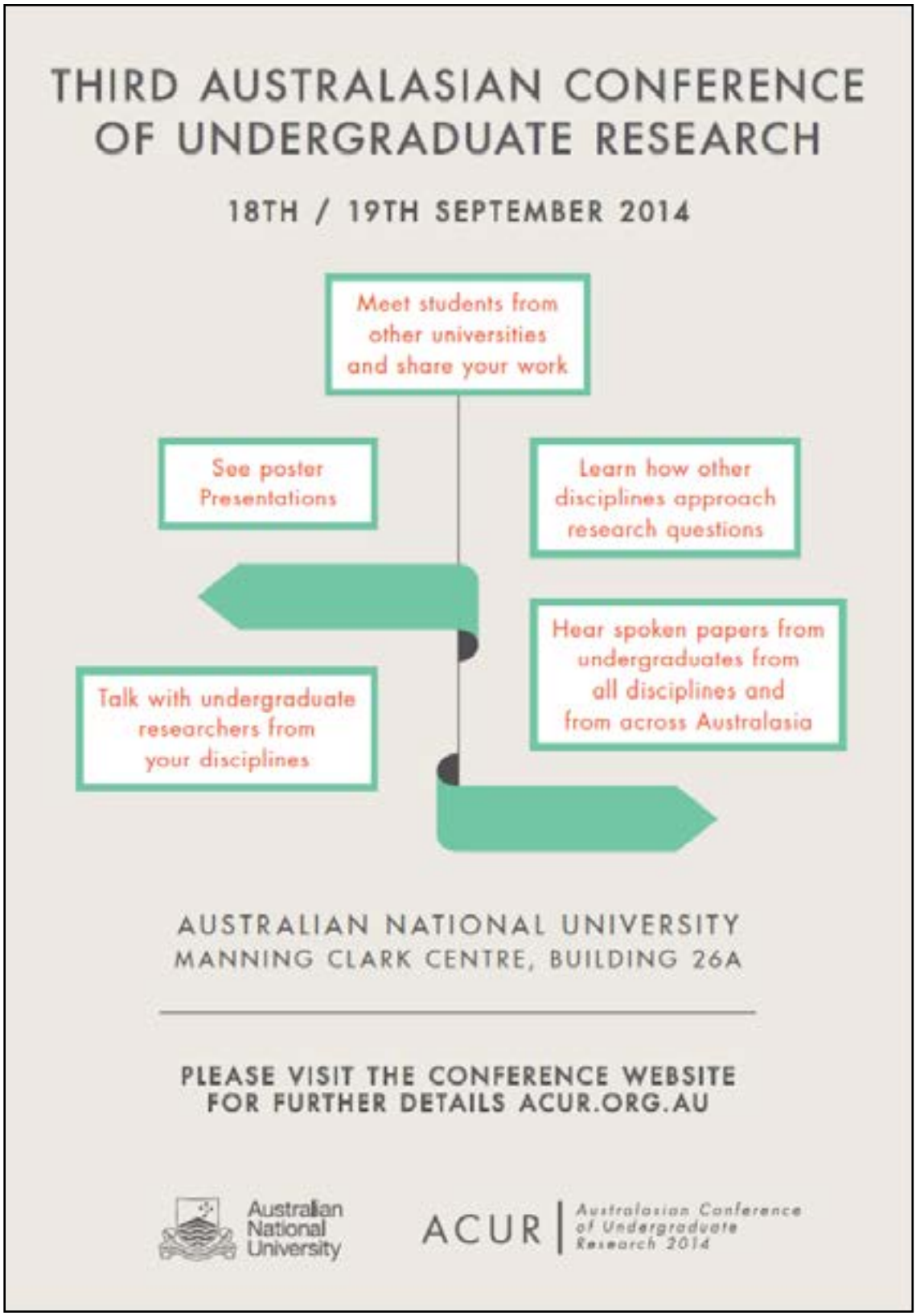
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