

The First Australasian Conference of Undergraduate Research (ACUR) Kicks Off on Facebook

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ACUR 2012 – the first undergraduate research conference of its kind in Australasia – is fast approaching. On 20 September, Macquarie University will be home to dozens of young scholars from across all disciplines sharing their research and networking. For many, this will be their first experience of one of the staples of professional academic life.

But you don't need to wait to witness this vibrant research community in action. As many presenters are coming from outside Sydney and a variety of research interests are represented among them, the three of us have set up a Facebook group to provide a medium for everyone to get to know each other and to engage in friendly, scholarly discussion in the lead up to the conference.

The undergraduates have responded enthusiastically, and the page now has 75 members. Many are keenly following each other's research: "liking", commenting about common experiences and even making plans to meet up at the conference for further discussion. Erin Corderoy, a presenter who is also Editor in Chief of Macquarie University's main student publication Grapeshot, has put out a call to presenters to be interviewed on the day.

The topics mentioned by the presenters come in a staggering variety, traversing disciplines such as international law, environmental engineering, social work, Egyptology and emergency health. There will be presentations on the abundance and diversity of insects across roadside and non-roadside environments; Muslim women media advocacy in a post-9/11 context; and fear acquisition, extinction, and renewal in children, among other fascinating and important talks.

All signs point to ACUR 2012 being a fantastic display of undergraduate research.

To find out more about ACUR, please visit www.undergraduateresearchaustralia.com, and of course, join us on Facebook!



Photo: Paul Wright

Undergraduates show passion for research: ACUR 2012

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When we decided to set up a conference of undergraduate research we had no idea what to expect. Successful undergraduate research conferences had been held in the USA for many years, and the UK had run such conferences for the past three years. But Australasia? With no or little national funding for undergraduate research, what would be the response?

The answer? Overwhelming! The organisers have been inundated with high quality abstracts in an enormous range of subjects. So we are now looking forward to an exciting and stimulating day, when over 130 undergraduate student presenters and their supporters will come together at Macquarie University.

Abstracts have been reviewed by a panel of 28 subject experts. On the basis of the quality of the abstracts, some 57 spoken presentations, including some film and drama are arranged in four strands to provide something for everyone at each stage of the day. 64 poster presentations arranged in four sessions also provide opportunities for sharing the research that has been carried out. Just to give a flavour of the range of topics on offer at the conference, topics range from medical research for example, on topical subjects such as breast cancer and heart disease, to ancient history including using gaming software to research archaeology. A range of papers addresses issues of climate change in Australia and other regions of the world, and there are a number of fascinating astronomical presentations on, for example, interstellar clouds, pre-planetary nebulae and the search for planets outside our solar system. Literature is also well represented in presentations on, for example, Blake's "Innocence and Experience", Ovid's "Metamorphosis" and Eliza Keary's "Little Seal-skin". We can also look forward to an examination of a number of social issues including work on Australian guardians, community service, and driving in school zones as well as a range

of discussions on identity: Aboriginal identity, religious identity, Italo-Australian identity and discussions of gender issues both in modern and in ancient times. Biology is also well represented in discussions, for example, of invertebrates, predatory wasps, bees and fish as is psychology with presentations on, gesture, memory and belief and there are also papers on law, democracy, and so much more. A draft program is available on Macquarie's Learning and Teaching Week website http://staff.mq.edu.au/teaching/workshops_programs/expanding_horizons/.

The conference will begin and end with short keynote addresses by two of the world's leading experts on the undergraduate research experience: Professor Mick Healey and Professor Mike Neary. The day will end with prize-giving. A prize of \$1000 has generously been donated for the best paper at the conference, and a prize of \$500 has also been donated for the best presentation in computer science or electrical engineering. Prizes of \$100 book tokens have also been donated. Presentations judged to be the best will be published in a Special Issue of MQ Matrix (Macquarie University's Undergraduate Research Journal).

The conference is being organised under the auspices of the Macquarie University Learning and Teaching Week. We extend our thanks to the organisers of the Week for the opportunity to present the conference and the work they have done to facilitate this. Thanks are also due to the Pro-Vice Chancellor and Provost, Professor Judyth Sachs, and to our donors whose support has been invaluable.

Please draw the conference to the attention of your colleagues and students. It's not too late to register to attend. Please go to <http://www.mq.edu.au/ltc/LTCWorkshops/WorkshopDetails.php?WorkshopID=2695> and register with your email. Registration is free and everyone is welcome. We hope to see you there.

We expect this event to become a regular highlight of the academic year and in fact plans for a conference in 2013 have already begun.



Photo: Paul Wright

Publishing Undergraduate Research: a New Model of International Co-operation

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'Meaningful student engagement. . . challenges models of HE that emphasise binaries between research and teaching and between staff and students'

(Taylor and Wilding, 2009).

Since 2007 the University of Warwick has been supporting and encouraging undergraduate students to publish their research findings. *Reinvention: a Journal of Undergraduate Research* was created in order to embrace the notion of academia as a community, with students playing a strong and active role. The journal aimed to assist the passive student to become an active researcher (Metcalfe, 2007), attempting to subvert the hegemonic discourse that casts students as passive consumers of knowledge and in some part regain an intellectual influence over the shape of the university and the role of the student. *Reinvention* has worked for 5 years to provide students with the opportunity to become confident and articulate researchers, offering a platform from which they can demonstrate their research and writing abilities.

Since 2009 a partnership has also been growing between Warwick and Monash University, in Australia, with that partnership being formalised in 2011. The aim of the relationship is to increase the global reach of each institution, providing the opportunity to exchange staff, students, ideas and information in order to offer a seamless global Higher Education experience to students and staff. In a momentous expansion for *Reinvention*, that partnership now includes the work of the journal. In May this year, the journal was launched as a joint venture between Warwick and Monash. The new partnership will see Monash students joining the editorial team of the journal, becoming ambassadors for the publication and being a part of the marketing team. Monash academics will also come on board as advisors to the journal and members of the International Advisory Board. The first joint issue of the journal will be published in October this year with the publication being relaunched and renamed as *Reinvention: an International Journal of Undergraduate Research*.

Reinvention is run by both students and staff and accepts papers from all undergraduate students, in any subject, from any university in the world. With the 13th issue to be published later this year, the journal has housed almost 100 articles on topics as varied as heritability estimators in brain imaging (Ang et al, 2012), the performance of masculinities and Emo on MySpace (Brown et al, 2011) and the function of inn

signs in early modern European history (Dent, 2011). By publishing work from different disciplines and different countries side-by-side we hope to inspire students to think outside their own, perhaps more narrowly defined, research boundaries, to think differently about their methodologies, about geographical boundaries and perhaps redefine their idea of what research is. Our work naturally fits with the aspirations of the Monash-Warwick alliance and will no doubt flourish as a result of the collaboration.

All of the papers published in regular issues of the journal are peer reviewed, by academics from around the world. The choice of the term "peer-review" has occasionally been contentious, however *Reinvention* considers its authors to be researchers first and foremost, regardless of their substantive status as undergraduates. The journal hopes to create an environment in which academics may be considered "peers" in the same way as an eminent professor might "peer review" the work of a junior academic – like anyone starting out in a research environment, the work our authors produce will necessarily be looked at by more experienced professionals than them.

The review process is one of the key features of the journal, with feedback from the authors indicating that it is different from the normal comments they receive:

'The feedback was brilliant, it was far more detailed than I had experienced with assessed/ class work and I had not predicted such a detailed response. To date it has been the single most helpful process with regards to my writing skills'

'A very valuable learning point was the quite precise criticism of the peer reviewers – up to that point, feedback had always come from teaching staff and had not been quite as critical and detailed. This experience has certainly been useful for the subsequent research Masters that I have started'

Peer reviewers are given extensive guidelines to ensure that their feedback provides an authentic yet supportive review of the authors' work. For many students this is their first foray into the world of publishing and it is important that they are given feedback regardless of the outcome of the reviews.

Reinvention also provides training on writing for publication, aiming to increase students' confidence, explain the role of the peer reviewer and provide support before students embark on the daunting process of writing up their research findings. This training is being adapted to be added to the journal website so that it is available to all students. The training sessions themselves will also be offered to Monash students in due course, offering an interesting test of our video conferencing equipment and our teaching skills! Feedback from the sessions has been universally positive:

'This session has improved my confidence in my own ability as an undergraduate to have my work published'

'The whole thing was fantastic and insightful, I feel a lot more enthusiastic and confident to give it a go'

'I feel confident, knowledgeable and more convinced that I wish to pursue this as a career in academia'

Our work within *Reinvention* has given us an insight into the role of the undergraduate within Higher Education and how students perceive themselves and are perceived by others as potential agents within the HE community. With undergraduate publishing still in its infancy in the UK and Australia, we hope that our collaboration with Monash will give that insight a further international element. As one of our authors commented 'I think *Reinvention* has huge potential to change people's understanding of academic research and of undergraduate study itself and the potential of students themselves'.



Photo: Paul Wright

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Towards mainstreaming inquiry oriented learning in the undergraduate science curriculum

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In 2011 Les Kirkup of the Faculty of Science, University of Technology, Sydney was awarded an ALTC National Teaching Fellowship. The Fellowship is entitled: Inquiry-oriented learning in science: Transforming practice through forging new partnerships and perspectives. He and his Program Officer, Ms Andrea Mears have been intent on supporting the transformation of practice in science in Australian universities by facilitating the adoption of inquiry-oriented approaches to learning. Here they relate the context in which they are carrying out the Fellowship and describe a key strand of the Fellowship.

In an address to the National Press Club in May 2012, Australia's Chief Scientist, Professor Ian Chubb, expressed the view that: The teaching of science should resemble the practice of science more than it does; and the relevance of science as it is taught should be as obvious as the standards are high.

While Professor Chubb's remarks were directed principally at primary and secondary education, they are equally apposite to higher education in Australia. For example, the undergraduate laboratory experience very often does not 'resemble the practice of science', especially for students in large enrolment first year subjects, but remains dominated by uninvolved 'cookbook style' experiments which have been criticised for the best part of a century. As Bless said in 1933:

Cookbook instructions certainly do not stimulate the student's capacity for reasoning or ...ingenuity. If anything they are stifled under such a procedure. The instructions for carrying out a given experiment should be conspicuous by their absence...

The move away from constrained and constraining undergraduate experiences in the laboratory (and the field) has progressed at a modest pace in all science disciplines. Despite this, there are excellent examples of where inquiry oriented activities have been introduced

in a substantive way to the undergraduate curriculum to excellent effect (see, for example Casotti et al. 2009). Inquiry-oriented activities expose students to, and involve them in, the processes of science and therefore reflect much better what scientists actually do. As examples, through such activities students engage with questions that have no predetermined answer, gather evidence, and formulate and communicate explanations/conclusions based on that evidence.

Importantly, influential advocates, including the Chief Scientist and the Australian Council of the Deans of Science (ACDS) are putting their weight behind reinvigorating science curricula through inquiry. A powerful driver for large scale reform towards inquiry in the science curriculum originating from within the community of tertiary science educators is the Science Learning and Teaching Academic Standards Statement (2011). The Statement describes, through the articulation of Threshold Learning Outcomes (TLOs) what science graduates should know and be able to do (as a minimum). These TLOs have brought a fresh emphasis and impetus to inquiry in the curriculum. More specifically TLO3, which focusses on inquiry and problem solving,

requires students be able to critically analyse and solve scientific problems by: gathering, synthesising and critically evaluating information from a range of sources; designing and planning an investigation; selecting and applying practical and/or theoretical techniques or tools in order to conduct an investigation, and; collecting, accurately recording, interpreting and drawing conclusions from scientific data.

It is against this backdrop that our Fellowship activities have occurred. The Fellowship adopted a number of approaches to promoting the national conversation on learning through inquiry in Australian universities and engaged not only academics in this conversation, but students, academic policy makers and others from outside the university sector. Most particularly, Andrea and I were intent on facilitating demonstrable changes in practice towards inquiry oriented learning (IOL). Details of the Fellowship and its activities can be found at <http://www.iolinscience.com.au/>.

To give a flavour of the Fellowship and its outcomes to date we focus in this article on one strand that gained momentum over the period of the Fellowship: We invited expressions of interest (EOI) from academics intent on developing,



Photo: Phillipa Janos

trailing and embedding inquiry-oriented activities in their curriculum and supported each successful EOI with a modest amount of money (\$2000). These activities became known as the ALTC Fellowship Funded Activities (AFFAs). In promoting the AFFAs, we were inspired by Elton (2003) who stated:

The appropriate collaboration of relevant agencies, both inside and outside universities may be able to use certain systematic strategies to achieve positive systemic change.

It was our intention to give groups the opportunity to be part of a national, multi-disciplinary group and to share their experiences and progress with others engaged in similar activities at several universities across Australia. Ten applications were funded (though one did not proceed as the principal applicant moved to another university). The nine that did proceed originated in Science Faculties at the Universities of Queensland, Adelaide, New England and Tasmania, as well as Charles Sturt, Flinders and Murdoch universities. The core disciplines of physics, chemistry and biology were equally represented amongst the AFFAs.

We encouraged the formation of small teams with diverse backgrounds and capabilities to develop, trial and embed IOL activities within the curriculum; engage institutional leaders, senior academics and educational developers in the IOL development; enhance recognition for the work being done by academics in developing inquiry activities within their own institution by being involved with a national program of activities; act as a seed to attract more funding internally. Support from the Fellowship came in several forms; perhaps the most valuable was the running of focus groups with students to explore their experience of, and attitude towards, IOL activities. Participants expressed the view that

the AFFA gave them the 'impetus to act'.

The AFFAs have developed IOL activities and successfully trialled them. Details of the individual AFFAs and recent summaries of their work can be found at <http://www.iolinscience.com.au/our-iol-activities/new-partnerships-and-networks/>. As an example, one of the activities was devised by Dr Margaret Wegener and Dr Tim McIntyre from the University of Queensland. They developed an inquiry experiment for first year students enrolled in a physics subject, but who were destined to major in the biological sciences. Beginning with practical exploration of the thermal properties of materials, students progressed to design the cladding of their dwelling (which in fact was a scale model of a house) in order to minimise temperature variations within the house. Students then realised their design and exposed their house to the elements, using internet technology to monitor in real time the behaviour of the house from remote locations.

We have visited 5 AFFAs and run focus groups to gauge the local impact of the IOL activities. These focus groups have shed light, not only on the activities as designed, but on the disposition and preparedness of students to engage in IOL activities. Giving the students a 'voice' has made a vital contribution to the Fellowship and has assisted both the AFFA recipients to further develop their activities' and admitted the Fellow a contemporary, authentic (and in some cases sobering) insight into how students react to such activities. It is appropriate we leave the last word to them.

"With inquiry, you wonder 'why' and 'why' is a way of improving on what you know and consolidating what you brought into the experiment."

Second year student metropolitan university

"What really helps with learning is that you are doing it yourself rather than the traditional [approach] where someone is telling you something and you take in one word out of every thirty."

Third year student metropolitan university

"It is great that they are trying to do this. I remember when I was in first year you could tell they had been giving the same lecture for 40 years, it is pretty horrific... They had no desire to change their style and even in suggesting something they would go 'that is how life is in a university'. How that correlates to graduating from here with quality science students, won't be seen for a few years yet, but it is great they are trying."

Third year student metropolitan university

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Who are the scholars in our universities?

Aron Downie, Penny Van Bergen and Angela Brew
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At Australian universities, many students tend not to be involved in academic projects. Often they do not participate beyond their own classes. A recent survey of 200 Macquarie University undergraduates found that:

- Many students were unaware that staff research took place
- Many students did not think they developed their own research skills
- Half of the students surveyed experienced research passively
- Only half of the students surveyed were aware of research centres and reputation

Since 2009, efforts have been made to raise the profile of undergraduate research and encourage staff to increase the research opportunities of students. This is in line with the aim of the Macquarie Academic Plan to develop a pervasive research culture and the University's stated desire to develop critical and creative thinkers.

A new Project

A new project funded through the Innovation and Scholarship Program, Macquarie University aims to establish the Macquarie Undergraduate Research Student Society. The society will offer undergraduate (UG) Research Internship opportunities, grow a community of UG researchers, and investigate learning and teaching in higher education. There are three distinct stages that will facilitate these aims.

Stage 1 will establish a core group of UG researchers and a broader undergraduate research community with an interest in higher education learning and teaching. This will begin in Semester 1, 2013. Peer reviewed publications will result.

Stage 2 will see the creation of the Macquarie Undergraduate Research Student Society. This society will run seminars, displays and stalls in O-Week, and other social events. The society will lobby for changes to curricula, including UG research experiences within departments.

Stage 3 will consist of planning and running the Second Australasian Conference of Undergraduate Research (ACUR) in 2013. The conference will draw on



Photo: Aron Downie

the experiences of the first ACUR which is to be held in September 2012. Over 130 UG students from across Australasia are presenting at ACUR 2012. There is a \$1000 prize in 2012 for the best paper and presentation.

Evaluation

The core group of UG researchers and the Steering Group will work through successive action research cycles of reflection and action. Late in 2013 the team will investigate the extent to which enthusiasm for UG research has spread, and the extent to which research opportunities have increased. The project will be deemed successful if in 2013 there is a strong and vibrant Undergraduate Research Student Society planning for a 2014 conference.

Upcoming events



First Australasian Conference of Undergraduate Research (ACUR)

20th September 2012

The First Australasian Conference of Undergraduate Research (ACUR) is to be held at Macquarie University in Sydney on 20th September 2012. This one-day conference will include poster presentations and spoken papers by undergraduate students from all disciplines and from across Australasia. The conference follows successful undergraduate research conferences in America (NCUR – now in its 29th year) and in the UK (BCUR – now in its 3rd year). An undergraduate research conference is just like any other academic conference but each presentation will be delivered by undergraduate students presenting work they have done either as part of their course or as part of an internship. Register at: <http://www.mq.edu.au/ltc/LTCWorkshops/WorkshopDetails.php?WorkshopID=2695>.

Showcase of Good Practice in Undergraduate Research and Inquiry

Friday 21st September 2012, 11.30am to 13.00pm and continued at 1.30pm to 3.15pm

Convenor: Professor Angela Brew Venue: Y3A 211 Macquarie University

The Showcase aims to demonstrate examples of good practice in how to actively engage undergraduate students in research. Macquarie academics from different departments have been invited to share their experience of engaging students in research. Presentations will also provide guidance in Ethics protocol and Ethical practice in involving students in research. Professor Mike Neary, Dean of Teaching and Learning at the University of Lincoln, will open the Showcase with a presentation on Student as Producer - Reinventing the Undergraduate Curriculum.

For further information go to the Showcase website:

http://staff.mq.edu.au/teaching/workshops_programs/expanding_horizons/abstracts/#showcase



Photo: Brett Cornish

Value, Impact, and Best Practices: Maximizing REU SBE Potential

Sunday, September 23, 2012 - Monday, September 24, 2012 1:00 PM - 6:30 PM USA Eastern Time

Hilton Arlington, 950 North Stafford Street, Arlington, Virginia 22203, USA, 703.528.6000

This workshop organised by the Council on Undergraduate Research (CUR) is designed to support the professional development of faculty and students already involved or interested in the National Science Foundation's (NSF) Social, Behavioral, and Economic Sciences (SBE) Research Experiences for Undergraduates (REU) program. Support to defray the costs of the workshop for SBE REU Principal Investigators has been generously provided to the Council of Undergraduate Research.



Undergraduate Research and Change in Higher Education

Wednesday October 24th 2012

Convenors: Kelly McConnaughay (Bradley University), Rachel Spronken-Smith (University of Otago)

This Council on Undergraduate Research (CUR) Symposium forms part of the pre-conference program for the International Society for the Scholarship of Teaching and Learning Conference (ISSOTL), Hamilton, Ontario, Canada. In this day-long symposium we plan to explore how undergraduate research effects change in Higher Education, and how a variety of changes in Higher Education affect undergraduate research.

For further information go to the conference website:

http://issotl12.com/wp-content/uploads/2011/12/ISSOTL2012_ProgramDraft_Web.pdf



Contact us:

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