

## About URNA

Welcome to Issue 2 of *Undergraduate Research News Australia* (URNA)! This occasional newsletter was set up to provide information about developments, upcoming events, and resources on engaging undergraduates in research and inquiry, principally in Australia.

This issue has been prepared with the help and support of many people on the Australian Undergraduate Research Network, including many of our overseas colleagues. There are currently some 250 people working in Australian universities in the network. My thanks to those who responded to emails with information or articles.

Currently, the future of the ALTC, which funded the National Teaching Fellowship through which URNA was established, is uncertain. Indeed, as Australian academics will be aware, the Federal government has proposed to abolish it. In this context, it is important to note that the ALTC is the only national body in Australia which has publicly recognised the importance of undergraduate research and has put money into developing it.

Let us hope that sense will prevail and that Parliament will ensure that the ALTC is allowed to continue its work.

*Professor Angela Brew*

*Macquarie University*

*March 2011*

## Undergraduate research alive and growing in Australia!

*Angela Brew and Evan Jewell, Macquarie University*

A report on undergraduate research experience programs in Australian universities has found that they are widespread and increasingly prevalent in Australian universities. This contradicts a widely-held view in the community that they barely exist!

The investigation aimed at identifying paid undergraduate research programs across Australia was carried out under the auspices of the ALTC National Teaching Fellowship of Professor Angela Brew. It examined the aims, purposes and outcomes of programs; their size and target student populations; levels of engagement, supervision; funding sources, and financial support to students. A scholarship or program was classified as "paid undergraduate research" where: students are engaged in active and supervised research; they receive remuneration for their research (unpaid, voluntary internships were excluded); and the scheme is formally advertised on a university website.

Internet searches of the websites of 39 Australian universities, and 31 external bodies funding undergraduate research were carried out. This was followed up with emails and telephone conversations with over 100 university academics and administrators, and representatives from external funding bodies. It was found that:

- undergraduate research experience programs are widespread in Australian universities. They exist in 23 of the 39 universities
- programs operate in a number of disciplinary areas; however, there is a strong emphasis on the STEM (science, technology, engineering, and mathematics) disciplines.
- programs tend to target elite undergraduates, and predominantly focus on senior undergraduates (third year and above), rather than junior undergraduates (first and second year)
- the primary aim of the programs is to maintain and grow a pipeline of undergraduates progressing into Honours and research higher degree programs.
- the majority of programs have been recently established and are growing
- programs operate on several different administrative levels and structural models; however, there is a trend towards creating

institution funded schemes offered on a university-wide basis

- student numbers in the programs, though small in comparison to national student enrolments, are still significant (1500-2000 students per year) and increasing in some programs
- outcomes of most programs for students are yet to be formally evaluated.
- funding is the primary challenge for the future of the programs, both in terms of sustainability and growth.
- Governmental and research council funding is lacking or entirely absent in most programs
- academic supervisors receive little financial or formal academic recognition from central university administrations or research funding bodies for their role in the programs, and the impact of undergraduate research within their own research projects is currently unknown.

The data clearly indicate that paid undergraduate research programs have an established presence in Australian universities, and that a significant number of undergraduates are engaged in a dedicated program of research and inquiry. Whilst the actual number of programs is not representative of how actively a particular university is supporting and initiating paid undergraduate research, the number of overall participants within each program can provide some indication. The top 5 research universities, according to the 2010 ERA results, account for some 60% of the students participating in undergraduate research experience programs. However, the large number of universities that have one or more of these programs suggests that the importance and potential of undergraduate research has been recognised amongst the majority of Australian universities.



*Photo: Brett Cornish*



## Undergraduate research across multiple disciplines

Dr Paula Myatt, The University of Queensland

Undergraduate research can be defined, and experienced, more broadly than the traditional model of a student research project situated in a single laboratory.

In 2009, Kirsten Zimbardi and Paula Myatt conducted a study at The University of Queensland to investigate the diversity of undergraduate research opportunities available across the entire institution.

The final report from the study (Farrand-Zimbardi, van der Burg and Myatt, 2010) is available online via [espace.library.uq.edu.au/view/UQ:212669](http://espace.library.uq.edu.au/view/UQ:212669).

The large research project developed detailed descriptions of 77 research activities and brief descriptions of an additional 58 activities across 28 Schools within the institution, ranging from Archaeology to Dentistry, from Science to Social Work and from Engineering to Journalism.

The broad range of disciplines included in the study highlighted variations in the *language* used to describe

academic research, and also the *research activities* undertaken by undergraduates.

To assist in the identification of undergraduate research across such diverse disciplines the study developed a clear understanding (definition) of undergraduate research using the previous work of Healey (2005), Jenkins and Healey (2010) and Beckman and Hensel (2009).

The study explicitly focussed on undergraduate research models which *actively* engaged undergraduate students with the research of their discipline, and excluded models in which students were more *passive* (less engaged) in the research experiences. Importantly, this study engaged academic staff in explicit conversations about the nature of undergraduate research and enabled individual academics to understand more clearly the diversity of possible ways to engage students in undergraduate research.

The benefits of the study included not only the data obtained but also the indirect benefits of raising the profile of undergraduate research through academic discussions.

Full report: [espace.library.uq.edu.au/view/UQ:212669](http://espace.library.uq.edu.au/view/UQ:212669)



*Undergraduate research in action: University of Queensland 2nd year physiology students design and conduct their own experiments in "Inquiry Practicals"*

### References:

- Beckman, M. & Hensel, N. (2009). Making explicit the implicit: defining undergraduate research. *CUR Quarterly*, 29, 40-44.
- Healey, M. (2005). Linking research and teaching: Exploring disciplinary spaces and the role of inquiry-based learning." In R. Barnett (Ed.), *Reshaping the University: New Relationships between Research, Scholarship and Teaching* (pp.67-78). Maidenhead, UK: Society for Research into Higher Education and the Open University Press.
- Jenkins, A., & Healey, M. (2010). "Undergraduate research and international initiatives to link teaching and research." *CUR Quarterly*, 30, 36-42.

## The Ultris Model

Professor Sally Sandover and Dr Lee Partridge,  
The University of Western Australia

The *Undergraduate Learning and Teaching Research Internship Scheme* (ULTRIS) was established in 2008 to provide an opportunity for selected undergraduates to have a practical research experience.

The establishment of ULTRIS, with a particular focus on research into teaching and learning matters at The University of Western Australia (UWA), was timely in light of the evolving world-wide push to engage undergraduate students in authentic research activities.

Achieving international excellence means universities are no longer asking 'whether' to implement undergraduate research, but 'how to'.

ULTRIS answers this question for UWA. In so doing, it addresses a number of University stated priorities from expanding "...opportunities for research-based learning in undergraduate courses" to encouraging "...greater interaction amongst students, staff and community" (The University of Western Australia, 2010).

By providing students with an opportunity to engage in

teaching and learning research, ULTRIS also determines the following:

- 1) what contributions undergraduates can make to teaching and learning through participation in relevant research;
- 2) an elucidation of the differences between postgraduate and undergraduate research to inform the development of a model for managing an undergraduate research program;
- 3) from the students' perspectives, what benefits might be achieved as a result of undertaking the research.

In addition, the existence of ULTRIS appears to be having positive side-benefits including an increased inclination for the participants to pursue postgraduate research, and institutional reputation as a leader in the field of undergraduate research.

To date, two rounds (2009 and 2010) of ULTRIS have been conducted with a total of 25 students completing 23 individual projects. A third round will commence in 2011. Interns are provided an income (\$3000 stipend) to complete the internship as an alternative to outside employment. Students in their second year of study are the most suitable to undertake the internship,

however students in other years (except the first or Honours year of study) are not excluded from applying.

Students can apply as individuals or groups of up to three students (in which case the stipend was shared between the members of the group).

Selected Interns undergo an extensive training period (basic research methods) during the summer vacation (Jan/Feb). This is coordinated by the Centre for the Advancement of Teaching and Learning (CATL) drawing on available expertise from across the university as required.

In 2009, the focus of the research was directed towards investigating the interaction between staff and students outside the classroom and ways that this might be enhanced while the 2010 cohort developed research projects in relation to the 'first year experience'.

These research projects were undertaken in the first semester of the year and findings were reported (as a scholarly paper and state and international conference presentation and faculty/university dissemination) by August of that year.

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## The Ultris Model

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Beneficial outcomes (both tangible and intangible) are already emerging from the two rounds of ULTRIS so far conducted. These gains can be seen to exist at the personal, institutional and sector-wide levels. Personally, students report having made gains through the development of their own individual knowledge, skills and attitudes. For example, all Interns point to the gains they have made in understanding and conducting research as well as preparing and giving oral presentations. From an institutional perspective, UWA gains through the retention of students at both the undergraduate and postgraduate level. ULTRIS offers the academic challenge, active learning, staff-student interaction that speaks to the quality of the undergraduate experience at UWA and its capacity to foster a sense of belonging. Moreover, it raises students' awareness of research as a graduate destination beyond their undergraduate qualification.

At the sector level, UWA gains the recognition and prestige associated with developing an innovative teaching and learning strategy within the tertiary sector. The unique features of ULTRIS have been recognised during recent dissemination of the ULTRIS project experience at international conferences and through publications. Institutions from Australasia, Europe and the US have indicated a broad level of interest in the model and a desire to undertake similar projects. With little evidence of undergraduate programs which focus on research into teaching and learning existing, ULTRIS provides an evidence-based exemplar for the provision of authentic research opportunities for undergraduate students.

The intended outcome for 2011 is to build productively on the basis established in the first two years of the internship. As awareness of the scheme spreads it is anticipated that a broader cohort of students will benefit from participation and that faculty support will grow in line with this increased recognition.



*UQ students and researchers get to know each other over lunch*

## News from overseas

The Council on Undergraduate Research (CUR, USA) Reports that "on January 4, 2011 President Obama signed into law the reauthorization of the America COMPETES Act. The bill specifically mentions support for research and internship opportunities for undergraduate students as well as support for predominately undergraduate institutions. Over 35 program officers from the National Science Foundation, National Institutes of Health, National Endowment for the Humanities, and several other agencies will provide information about new funding opportunities and what they would like to see in proposals at the CUR Dialogues meeting. Attendees at CUR Dialogues will receive the most up-to-date information available on funding opportunities." For further information see: <http://www.cur.org>

CUR will be celebrating **Undergraduate Research Week** April 11-15, 2011. They have requested that Congress declare that week as undergraduate research week and they passed the resolution in November.

Nancy Hensel, Executive Officer of CUR also draws the attention of Australian colleagues to an assessment program that many campuses in the US are using. It is free and funded by the Howard Hughes Medical Institute. Two instruments of use in the assessment of student learning in both research experiences and in classroom experiences in science are the SURE (**Summer Undergraduate Research Experiences**) survey and the CURE (**Classroom Undergraduate Research Experiences**) surveys. Both instruments have produced contributions to the literature on undergraduate science learning, as well as widely used instruments for institutional research and comparison to national benchmarks. David Lopatto has recently synthesized information from this work in his book, *Science in Solution*, which is available through the CUR website.

More information about the surveys may be found at:

<http://www.grinnell.edu/academic/psychology/faculty/dl/surecure>

Elaine Seymour also draws our attention to an online evaluation instrument for undergraduate research programs. It is called URSSA (**Undergraduate Research Student Self Assessment**). The questions are all based on research findings (see New Books below), and are intended to give teachers good feedback on specific aspects of their students' research experiences. The questionnaire is housed on the same web site as another student course evaluation instrument, The SALG (Student Assessment of their Learning Gains) because they share a common philosophy and structure. You can find them both on [www.salgsite.org](http://www.salgsite.org). If you have problems accessing or using URSSA, please contact Sandra Laursen, at the University of Colorado. [Sandra.laursen@colorado.edu](mailto:Sandra.laursen@colorado.edu).

**Reinvention: a journal of undergraduate research** is a UK-based leading online, peer-reviewed journal, dedicated to the publication of high quality undergraduate research. It is currently looking to increase its international reach in terms of the submissions it receives and the partners it works with. This presents an opportunity for Australian students and their supervisors. The journal publishes academic articles from all academic disciplines and articles can be submitted by students studying at any university in the world. These two features, along with the opportunities it provides the students involved in its publication make the journal quite unique. All articles undergo rigorous peer review, based on initial editor screening and refereeing by two or three anonymous referees. The journal is produced, edited and managed by students and staff of the University of Warwick, UK. To learn more go to [www.warwick.ac.uk/go/reinventionjournal](http://www.warwick.ac.uk/go/reinventionjournal), or contact Sarah Foster-Ogg, Journal Manager ([S.A.Foster-Ogg@warwick.ac.uk](mailto:S.A.Foster-Ogg@warwick.ac.uk)).

# New Books and Resources



## Undergraduate research in the sciences: Engaging students in real science

by Sandra Laursen, Anne-Barrie Hunter, Elaine Seymour, Heather Thiry, and Ginger Melton

Anyone with an interest in undergraduate research should read this book. It provides evidence, gathered from ten years of research, into the benefits of undergraduate research in the sciences. The book begins with a useful summary of other work on the outcomes of undergraduate research. The team's research findings are then presented in terms of student gains, longer term outcomes, the benefits of undergraduate research vis à vis other practices such as internships and the benefits and costs to academic supervisors. Published by Jossey Bass, 2010.



## Advancing Undergraduate Research: Marketing, Communications, and Fundraising

by Joyce Kinkead, Utah State University

This is the first book to address the growth and improvement of undergraduate research programs through advancement activities—marketing, communications and fundraising. Each of its three sections focuses on key principles of advancement philosophy: how to market undergraduate research; how to engage in strategic communications; and how to raise funds and also serve as stewards of those funds for donors. Examples of best practices are included and advice from savvy undergraduate research directors, as well as marketing professionals, is incorporated to help readers formulate and customize their own agendas. Available to order from the CUR website: <http://www.cur.org/publications.html>



## Science in Solution: The Impact of Undergraduate Research on Student Learning

by David Lopatto

Science in Solution shifts the science education focus from alarms about the shortage of STEM workers to the professional and personal benefits of undergraduates engaging in research. The shift suggests that undergraduate research may be a generator of scientists from across diverse groups of students. Research presented in the book documents the benefits of undergraduate research. Programs dedicated to undergraduate research are costly in time and money. Evidence presented here, however, shows that the benefits of undergraduate research are preserved in “research-like” courses. Courses that include the search for new knowledge, student input into the research process, communication, and group work replicate the benefits of the research experience. This finding opens the way for the benefits of the research experience to be made more widely available to students. Available to order from the CUR website: <http://www.cur.org/publications.html>



## Rethinking children and research: attitudes in contemporary society

by Mary Kellett

If anyone is skeptical about undergraduates engaging in research, they should read this book. Mary Kellett makes the case for children, some as young as 9 years old to be engaged in real research on childhood. Children bring to research different sets of questions. Examples of research by children in different countries are presented. Published by Continuum, 2010.



## Undergraduate Research at Community Colleges

and

## Transformative Research at Predominately Undergraduate Institutions.

These two monographs can be downloaded free from the CUR publications page.

<http://www.cur.org/publications.html>

## Website update

<http://www.undergraduateresearchAustralia.com>

The website grows on a weekly basis, and now contains nearly 75 distinct resources on a wide range of topics of interest to academics and others working to grow undergraduate research in Australia. There are also over 50 references to articles, books and further resources and 45 links to related websites including undergraduate research opportunities, undergraduate research journals, and upcoming events. The website continues to be available for searching, downloading documents, and bibliographic and internet browsing related to undergraduate research. It is also available for anyone to upload new resources, references and websites, as well as for giving us some feedback. New resources added go through a 'light touch' review process to ensure that they are relevant and of good quality. We would like to take this opportunity to acknowledge and thank all the contributors to the website which now provides such a rich source of material on undergraduate research.



## Newly added items are:

### *Community engaged undergraduate research*

The December issue of CalState University's (CSU's) 'Impact' – is now linked on the website. It contains a link to an e-publication highlighting various community based research efforts. This can be downloaded and there is a search index using keywords, such as region, social issues, campus, etc. Judy Botelho, Director, CSU Center for Community Engagement has contributed this resource and welcomes feedback on it.

### *Trends and best practices in summer research opportunities*

Contributed by Grechen Novak, Hanover Research Centre, Washington, DC, this report: *Summer Research Opportunities for Undergraduates: Trends and Best Practices* presents profiles of programs designed by 11 U.S. institutions of higher education, highlighting common trends in program structure, admissions, activities, faculty responsibilities, and student compensation.

### *Case study of setting up an undergraduate research program*

Jayde Cahir, has documented the process of setting up an undergraduate scholarship in the Learning and Teaching Centre at Macquarie University, including steps in the process, advertisement, interview schedule and other documents. This resource should be of use to anyone thinking of setting up such a scheme.

### *Challenges in implementing research and inquiry based learning*

This workshop handout has been used in a number of contexts by Angela Brew to provide a framework for academics to think about the challenges they face. The website contains many resources that address the challenges listed here.

### *Research-based learning decision-making wheel*

This wheel is a first attempt by Angela Brew to represent the decisions that need to be taken by academics when thinking about implementing research and inquiry experiences for students. It is designed so that people can begin in the centre, decide on which students they want to engage in this manner and then work outwards.

## Upcoming events

**April 19th - 20th 2011. British Conference of Undergraduate Research (BCUR).** The University of Central Lancashire (UCLan) will be hosting the first ever British Conference of Undergraduate Research (BCUR). For further information go to: <http://www.bcur.org>

**October 19th 2011. Second International seminar on undergraduate research.** This is on the day before the International Society for the Scholarship of Teaching and Learning Conference (ISSOTL) in Milwaukee, USA.

## What next?

### International (Australian/New Zealand) Conference for Undergraduate Research

Rachel Spronken-Smith from Otago University, NZ has proposed an International (Australian/New Zealand) Conference for Undergraduate Research following recent initiatives in the US and UK. She is looking for people interested in working on this idea with a view to holding a conference in 2012 or 2013. Please contact Rachel ([rachel.spronken-smith@otago.ac.nz](mailto:rachel.spronken-smith@otago.ac.nz)) if you think this is a good idea, if you would like to join a planning group, and/or, if you have suggestions for sponsors.

### New research project

In 2009 when we surveyed undergraduate research experience programs in Australian universities (Jewell & Brew, 2010), critical questions about how to support students and the costs and benefits to academics in undertaking the supervision of undergraduate researchers came to light. We now plan to explore these by seeking the views of coordinators of undergraduate research experience programs concerning the value and outcomes of such programs; and to begin to investigate how undergraduate students in Australia respond to such programs, what they believe they gain and how they intend to use what they have gained.

The study will comprise a survey of program coordinators (online and via email) and interviews with a selection; and interviews and focus groups with students who have received a stipend for undergraduate research engagement. Contact Angela Brew ([angela.brew@mq.edu.au](mailto:angela.brew@mq.edu.au)) if you have suggestions or would like more information.

## Contact us:

If you didn't receive this directly from us, it means that you are not on our list. Please let us know if you would like to join our extended network of interested people. For further information, or to submit an item for inclusion in the next issue, contact:

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