



*First Australian Summit
on the Integration of Research,
Teaching and Learning*

*Logo and cover designed by:
Mark Wilson*

*November 5th - 6th
Swiss Grand Hotel, Bondi Beach,
Sydney Australia*

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LEARNING AND
TEACHING CENTRE



The Summit is organized by staff in the Learning and Teaching Centre, Macquarie University, as an outcome of the Australian Learning and Teaching Council (ALTC) Fellowship of Professor Angela Brew. It is funded by the ALTC.

Learning and Teaching Centre, Building C3B, Macquarie University, Ryde, NSW 2109.
lrcenquiries@mq.edu.au Tel: +612 9850 9795 Fax +612 9850 9778

WELCOME

It's my pleasure to welcome you to this *First Australian Summit on the Integration of Research, Teaching and Learning*. The Summit is an outcome of my ALTC National Teaching Fellowship. I very much hope that you will find it interesting and engaging and that it will inform strategies for future development of this important field in your institution and across our nation.

I recently carried out a survey of the institutional and teaching and learning plans of all Australian universities and found that developing the relationship between research, teaching and learning is a key strategy in almost all of them. It is commonly viewed in terms of embedding research in education, strengthening the research-teaching nexus; in providing opportunities for students to participate in research; and/or in developing research-led or research-enhanced learning and teaching.

The integration of research and teaching describes a large and complex agenda. I have found in my work to strengthen this relationship over the past ten years or so, that what it means for institutions, for academics and for policy-makers continually needs to be re-visited.

In this first Australian Summit, the focus is primarily on students' engagement with research in the contemporary university. It is hoped that the Summit will result in the establishment of a *Communiqué* addressed to institutions and indeed, to the federal government, regarding developments and funding of this area of activity in the future.

In preparing the program I have been assisted by the good will and collaboration of the national and international teams of expert contributors all of whom have experience of integrating research, teaching and learning and especially in involving undergraduates in research and inquiry. I have also been greatly assisted by Jayde Cahir, the Fellowship Administrator and Evan Jewell, the Fellowship Undergraduate Scholar, as well as by my colleagues in the Learning and Teaching Centre at Macquarie University.

Professor Angela Brew
ALTC National Teaching Fellow
Macquarie University

PROGRAM

DAY 1: THURSDAY 5TH NOVEMBER

8.30 am	Registration and coffee
9.00 - 9.20	Welcome. Professor Judyth Sachs, Deputy Vice-Chancellor and Provost, Macquarie University.
9.20 - 9.40	Integrating research, teaching and learning: Summit aims, rationale and outcomes. Professor Angela Brew, ALTC National Teaching Fellow, Macquarie University.
9.40 -10.40	Keynote address: Establishing the value of undergraduate research: engaging students in real science. Emeritus Professor Elaine Seymour, Ethnography & Evaluation Research, the University of Colorado at Boulder, USA.
10.40 - 11.10	Morning Tea
11.10 -12.10	Keynote address: National Science Foundation models for funding undergraduate research. Dr Linda Slakey, Executive Director, Division of Undergraduate Education, National Science Foundation, USA.
12.10 -12.40	Questions and issues for Australia. Professor Kerri-Lee Krause, Acting Pro-Vice-Chancellor (Quality and Student Outcomes) and Director, Griffith Institute for Higher Education, Griffith University.
12.40 - 1.30	Lunch
1.30 – 2.10	Roundtable discussion of questions to put to the panel. To include sharing of what institutions are doing/good practice and issues etc.
2.10 - 4.00	Plenary panel Chaired by Professor Mick McManus, Acting Deputy Vice-Chancellor (International) University of Queensland. <ul style="list-style-type: none">• Dr Jeanette Baird, Audit Director, Australian Universities Quality Agency• Mr David Barrow, President, National Union of Students• Professor, Iain Hay, ALTC Discipline Scholar for the Arts, Social Sciences and Humanities, Flinders University.• Professor John Rice, Executive Director, Australian Council of Deans of Science• Professor Andrew Wells, Executive Director, Humanities and Creative Arts, Australian Research Council
4.00 - 4.30	Afternoon Tea
4.30 - 5.30	Keynote address: Institutional strategies to integrate research, teaching and learning: The Sheffield University experience. Professor Phillipa Levy, Director, Centre for Inquiry-based Learning in the Arts and Social Sciences, University of Sheffield, UK
5.30	Break
6.30	Drinks
7.00	Dinner

DAY 2: FRIDAY 6TH NOVEMBER

- 9.00 - 9.15 **Welcome** by Professor Richard Johnstone, Executive Director ALTC
- 9.15 -10.15 **Keynote address: Developing undergraduate research across the USA: The work of the Council for Undergraduate Research.** Dr Nancy Hensel, Executive Director, Council for Undergraduate Research, USA.
- 10.15 - 10.45 **Roundtable Discussions** on issues arising and draft *Communiqué*
- 10.45 -11.15 **Morning Tea**
- 11.15 **Parallel Sessions** with examples from practice:
- 11.15 -12.00 **The teaching research nexus and the first year student experience: What are the possibilities?** Professor Sally Kift, ALTC Senior Fellow, Director of First Year Experience, Queensland University of Technology. **Discipline, diversity and the development of all students' research skills.** Drs John Willison, University of Adelaide and Susan Mayson, Department of Management, Faculty of Business and Economics, Monash University.
- 12.00 -12.45 **Motivating the first-year learner through research informed media practice.** Dr Denise Wood, University of South Australia. **Students' engagement with the discipline: The impact of the undergraduate research journal *Nexus*.** Professor Brian Yates, Head, School of Chemistry, University of Tasmania.
- 12.45 - 1.45 **Lunch**
- 1.45 - 3.00 **Interactive keynote address: Institutional practices and strategies to develop undergraduate research and inquiry.** Professor Mick Healey, Director, Centre for Active Learning, University of Gloucestershire, UK.
- 3.00 - 3.30 **Final Plenary Discussion:** taking these issues forward on a national level. Led by Professor Angela Brew, ALTC National Teaching Fellow, Macquarie University.
- 3.30 **Afternoon Tea and close**

PRESENTATIONS

DAY 1

9.40 - 10.40

Establishing the value of undergraduate research: engaging students in real science

Emeritus Professor Elaine Seymour
University of Boulder Colorado, USA.

Elaine Seymour draws on the research and evaluation studies of her own group (Ethnography & Evaluation Research, the University of Colorado at Boulder, USA) in discussing the shorter and longer-term outcomes for students and their research advisors of intensive, authentic research collaborations, largely in the sciences. She also discusses how such outcomes are achieved and how they may be assessed.

11.10 -12.10

National Science Foundation models for funding undergraduate research

Dr Linda L. Slakey
Division Director
Division of Undergraduate Education
National Science Foundation, USA

The National Science Foundation has a long-standing program that funds undergraduate participation in faculty research, typically during the summer. In recent years it has added programs that promote interdisciplinary study while supporting undergraduate research, and that encourage faculty to organize parts of the curriculum so that core courses provide students with authentic research experiences as well. Examples of all these approaches will be presented.

12.10 - 12.40

Questions and issues for Australia

Professor Kerri-Lee Krause
Griffith University

The Bradley Review of Higher Education and the Federal Government's response to it indicates a number of challenges that the integration of research, teaching and learning and specifically, undergraduate research addresses. In particular, concerns with educating the next generation of researchers and academics, and the need to ensure that universities encourage critical inquiry. In this session, Kerri-Lee Krause will set out a number of questions and challenges that will be considered firstly in roundtable small group discussions following lunch, and then in the plenary panel session.

2.10 - 4.00

Plenary Panel

Chaired by Professor Mick McManus
University of Queensland.

Panel members

- Dr Jeanette Baird, Audit Director, Australian Universities Quality Agency
- Mr David Barrow, President, National Union of Students
- Professor, Iain Hay, ALTC Discipline Scholar for the Arts, Social Sciences and Humanities, Flinders University.
- Professor John Rice, Executive Director, Australian Council of Deans of Science
- Professor Andrew Wells, Executive Director, Humanities and Creative Arts, Australian Research Council

Panel members will first be invited to respond briefly to the challenges and issues posed for Australia and the discussion will then be opened for general comment. We hope that there will be a full and frank debate that will result in the development of a *Communiqué* to be distributed widely within the sector.

4.30 - 5.30

**Institutional strategies to integrate research, teaching and learning:
The University of Sheffield experience**

Professor Philippa Levy
University of Sheffield

This keynote will take as its point of departure the proposition that the integration of research, teaching and learning is essential to the ecological balance of the 21st century university. Professor Levy will offer an overview of institutional strategies adopted at Sheffield, a research-intensive institution, to improve this integration. She will highlight in particular the work of a nationally-funded Centre for Excellence in Teaching and Learning (CETL) that is based at Sheffield, and that has aimed to approach this theme holistically through strategies including: nurturing of undergraduate research within the curriculum (through inquiry-based learning) and beyond it within the co-curriculum; strategic focus on students' information literacy development; development of an innovative model of student partnership working in educational enhancement; design of new learning and teaching spaces ('inquiry collaboratories'). The CETL has also initiated an institutional research project to explore students' and academic staff's experiences of learning, teaching and research linkages in the Sheffield context, and is contributing to institutional-level development of 'the Sheffield Academic' concept, in which professional commitment to integration of research, teaching and learning is seen as fundamental. Professor Levy will reflect both on what has been achieved and learned through the implementation of these strategies, and on some of the challenging questions and issues that have arisen

DAY 2

9.15 - 10.15

Developing undergraduate research across the USA: the work of the Council on Undergraduate Research

Dr. Nancy Hensel
National Executive Officer
Council on Undergraduate Research

For the past thirty years the Council on Undergraduate Research has supported and promoted high-quality undergraduate student-faculty collaborative research and scholarship. Growing from ten original founders to 4000 individual members and nearly 600 institutional members, the Council has provided workshops, institutes, consulting and conferences to encourage undergraduate research at US campuses. While the emphasis was originally on science undergraduate research at liberal arts colleges, the Council now includes all disciplines and all types of colleges and universities. The session will focus on the activities of the Council as well as some of the issues and questions about undergraduate research.

10.15 - 10.45

ROUNDTABLE DISCUSSIONS

A draft *Communiqué* will be available for discussion and debate in small groups. A structure for this might be the following:

- Rationale
- Key issues
e.g. Infrastructure and funding
- Challenges to be addressed
e.g. Curricula and assessment
Quality and standards
- Opportunities for Australia
e.g. Impact
Value added

11.15 - 12.00
Option A

**The teaching research nexus and the first year student experience:
What are the possibilities?**

Professor Sally Kift
Queensland University of Technology

Diverse student cohorts entering their first year of undergraduate study face multiple transitions and challenges in working towards their successful learning engagement in both higher education and their new discipline of study. What role might the integration of research, teaching and learning realistically play in supporting this transition and enhancing first year learning, success, and retention? This session will discuss this issue and explore some possible responses.

12.00 - 12.45
Option A

**Motivating the first-year learner through research informed media
practice**

Dr Denise Wood
University of South Australia

There is a significant body of literature highlighting the importance of student engagement in the first year of undergraduate study (Krause et al, 2005; Kift, 2008). McInnes (2003) argues that enhancing the teaching and research nexus through strategies designed to involve students in research-based learning activities is one way in which academics can help to reconnect disengaged students with the University learning community. However, despite the reported benefits of strengthening the teaching and research nexus in the curriculum (Boyer Commission, 1998; Brew and Boud, 1995; Brew and Prosser, 2003; Elton, 2001; Rowland, 2006), newer universities that have parented vocationally or professionally based areas of study (Hazelkorn, 2004) face particular challenges in their attempts to engage students in research within the undergraduate curriculum (Wood, 2009).

These challenges together with effective strategies employed to engage first-year learners through inquiry learning and reflective practice will be explored in this presentation. Drawing on the findings from four years of student evaluations of a first-year media arts course, Dr Wood will discuss the apparent contradictions and tensions encountered in attempting to meet the expectations of students who regard training in media production as 'entrée to the media industries' (Quin, 2006) and the need for them to develop skills in critical discourse, analysis and research (Thornham and O'Sullivan, 2004, p. 720). The findings from this case study highlight the benefits to be gained by engaging first-year learners in authentic research through inquiry learning and media related activities they perceive to be meaningful, relevant and likely to 'make a difference'. [References available at the Summit]

11.15 - 12.00
Option B

Discipline, diversity and the development of all students' research skills

Dr John Willison, University of Adelaide
and
Dr Susan Mayson, Monash University

I suppose when you get that skill of being able to research, I think it sort of inspires something in you that makes you want to find out things or learn more. If I follow my Public Health strain, then I probably see myself getting a job in some sort of NGO or department, and then collecting data and doing surveys and researching things and finding things that other people have done, and then either being able to support that or prove it wrong. (2008 interview with a 2007 cohort First Year Human Biology Student)

For Australia to enable university students to proceed to employment with critical enquiry skills and increase the number of students progressing satisfactorily through honours and HDR, guidance is needed for academics to realize the development of all students' research skills in content-rich undergraduate and masters by coursework programs. This guidance needs to be 'academic-friendly' because workloads and others' agendas leave little time for those teaching in the disciplines to adapt their curriculum and assessment in ways that are appropriate to developing research skills. Such guidance should complement academics' own agendas, resonate with their understandings of research processes in their disciplines, lead to efficiencies and be sustainable. It also needs to be flexible so that it is adaptable to the university, school, discipline and student contexts.

One contemporary example of this guidance is provided by the Research Skills Development (RSD) framework, a conceptual model being utilised in disciplines as diverse as Business, Dentistry, English, Electronic Engineering, and Vet Science, in a variety of university types, including G8s and ATNs, and year levels from First Year to Masters. Within many disciplines and contexts, academics have been utilizing the RSD framework, to enable explicit, coherent and incremental development of research skills in undergraduate and masters-level courses. The RSD framework typically informs the remodeling of existing assessments so that they are research-focused and designed to develop students' research skills incrementally. Such an approach has a profound effect on the curriculum as experienced by students.

This presentation will outline the Research Skills Development (RSD) framework, and present discipline-specific examples of its implementation, focusing on examples from Business. Long term outcomes for students and for academics will be presented, so that informed consideration can be given to explicit research skill development and assessment of the diversity of students across all disciplines, in order that more graduates will be research-ready for employment and for HDR. RSD Website: www.adelaide.edu.au/clpd/rsd

12.00 - 12.45
Option B

Students' engagement with the discipline: the impact of the undergraduate research journal *Nexus*

Professor Brian Yates
University of Tasmania

I will describe the workings of *Nexus*, the journal for undergraduate research, at the University of Tasmania. We have assessed student engagement, motivation and performance in their chosen discipline as a function of participating in *Nexus* and I will discuss our preliminary results

1.45 - 3.00

Institutional practices and strategies to develop undergraduate research and inquiry

Professor Mick Healey
University of Gloucestershire, Cheltenham, UK

new models of curriculum ... should all ... incorporate research-based study for undergraduates (to cultivate awareness of research careers, to train students in research skills for employment, and to sustain the advantages of a research-teaching connection in a mass or universal system) ... (Ramsden, 2008:10-11)

Developing the Student as Scholar Model requires a fundamental shift in how we structure and imagine the whole undergraduate experience. ... It requires a culture of inquiry-based learning infused throughout the ... curriculum that starts with the very first day of college and is reinforced in every classroom and program. (Hodge et al., 2007: 1)

The argument of this session can be simply stated: *all* undergraduate students in *all* higher education institutions should experience learning through and about research. It is suggested that the key to mainstreaming undergraduate research and inquiry is to integrate it into the curriculum. This interactive session will explore a range of institutional practices and strategies that universities in Australia may consider adapting for their own use. The session will draw on mini case studies drawn from Australasia, Europe and North America and there will be opportunity to reflect on and discuss further ideas which have arisen earlier in the Summit. It is anticipated that delegates will leave the summit with an action plan on ideas they can take back to their institution.

PRESENTERS AND PANELISTS

(in alphabetical order)

Jeanette Baird, PhD, is Director of Self-Accrediting Institutions (SAI) Operations and Audit Director with the Australian Universities Quality Agency. She has a background in higher education and public sector management, with particular interests in quality enhancement, governance, and research training. Jeanette has presented numerous workshops on aspects of higher education quality assurance nationally and internationally, including auditor training programs. In 2007 she led an AUQA project to assist the Kingdom of Bahrain to establish its quality assurance arrangements for higher education, while in 2008 she led the Steering Group that developed for DEEWR the *Good Practice Principles for English Language Proficiency* for international students in Australian universities. Her publications address a range of issues in higher education, including research management, governance, the student experience and quality assurance.

David Barrow is the President of the National Union of Students. He is studying Media Arts and Production/International Studies (France) at the University of Technology, Sydney. Formerly President of the UTS Union Board and the NSW Branch of the National Union of Students, David has had 5 years of experience of organising and representing students. The National Union of Students has renewed its commitment to engaging in the sector seriously in order to confront the challenges that face today's international and domestic students and their student organizations. These include student poverty, high tuition fees, quality assurance, VSU, transport concession cards and discrimination towards international students in the rental market, classroom, workplace and on public transport.

Angela Brew is a Professorial Fellow in the Centre for Learning and Teaching at Macquarie University, and an Honorary Associate Professor at the University of Sydney. She is a 2008 Australian Learning and Teaching Council (ALTC) National Teaching Fellow, an elected Fellow of the Society for Research into Higher Education (SRHE) and a Life Member of HERDSA. Her research on the nature of research and human knowing and its relationship to teaching has been published widely and she has presented this work in numerous institutions in Australia and overseas. Her books include: *The nature of research: inquiry in academic contexts*; *Research and teaching: beyond the divide*; and (with Judyth Sachs) *Transforming a university: the scholarship of teaching and learning in practice*. Her latest book (with Lisa Lucas): *Academic research and researchers*, has just been published by McGraw Hill. From 1999-2003 she was President of the Higher Education Research and Development Society of Australasia.

Jayde Cahir is the administrator for the ALTC Fellowship project *Enhancing Undergraduate Engagement through Research and Inquiry*. Jayde is a doctoral student in the Centre for Cultural Research at the University of Western Sydney. Her thesis is entitled *Creating Traces: materialising the text message*. She has taught at the Australian College of English and as a volunteer teacher in Nepal. Jayde formerly worked in the telecommunication industry in both Australia and Ireland. Her most recent publication is a chapter entitled: *It's a security thing: mobile phones and moral regulation*, in S. Poynting and G. Morgan (Eds.), *Outrageous: Moral Panics in Australia*, published by Australian Youth Studies.

Iain Hay is the ALTC Discipline Scholar for the Arts, Social Sciences and Humanities, and former Head of the School of Geography, Population and Environmental Management at Flinders University. Professor Hay is a human geographer with core interests in geographies of domination and oppression; research for which he received a LittD (Canterbury) this year. In 2006 Iain received the

Prime Minister's Award for Australian University Teacher of the Year and in 2008 became one of the first non-UK residents to be admitted as a Senior Fellow of the Higher Education Academy. He is currently Vice-President (President Elect) of the Institute of Australian Geographers.

Mick Healey is Professor of Geography at the University of Gloucestershire, UK and Director of the Centre for Active Learning, a nationally funded Centre for Excellence in Teaching and Learning. He is also Director of a National Teaching Fellowship Project on *Leading, promoting and supporting undergraduate research in the new university sector*. Mick is an experienced presenter. Since 1995 he has given over 300 educational workshops, seminars and conference presentations in Australasia, Europe, North America and South-East Asia. He has written and edited around 150 papers, chapters, books and guides on various aspects of teaching and learning in higher education. In 2006 he was HERDSA Visiting Fellow in New Zealand and in 2008 he was the keynote speaker at the launches of the ALTC's project *Achieving Teaching Research Connections* in Perth, Brisbane and Melbourne. He is often asked to act as an advisor to projects, universities and national governments on aspects of teaching and learning in HE. In 2009 Mick was appointed an Honorary Professor at the University of Queensland and a Visiting Professor at Edinburgh Napier.

Nancy Hensel, PhD, is the Executive Officer for the Council on Undergraduate Research in Washington, D.C. Prior to assuming her current position in July 2004, she served as President of the University of Maine at Presque Isle from 1999-2004 where she adopted a theme of adventurous learning which encompassed intellectual, cultural, and outdoor adventures. She strongly advocated the inclusion of undergraduate research in the curriculum and under her leadership the *University Day* undergraduate research symposium was begun. Previously she served as Provost of the University of Maine at Farmington, 1995-99, where she also served as Dean of the College of Education. Before moving to Maine in 1992, she was Department Chair and Professor of Education at the University of Redlands, California. She holds a doctorate degree in early childhood education from the University of Georgia, masters' degrees in theater and early childhood education from San Francisco State University and a Bachelor of Arts degree in theater also from San Francisco State. In 2003 she was inducted into the Maine Women's Hall of Fame for her work in promoting higher education in Maine and supporting the role of women in higher education. She is the author of several articles on issues of family and work, creativity in young children, and diversity in education.

Evan Jewell is the Undergraduate Research Scholar on the Fellowship Project: *Enhancing Undergraduate Engagement through Research and Inquiry*. As such, he is carrying out an investigation into undergraduate scholarship schemes across Australian universities. A second year undergraduate student of ancient history and Merit Scholar at Macquarie University, Evan has published research articles in the History Teachers Association of NSW journal, *Teaching History*, and in the Classical Association of NSW journal *Classicum*. In his first year, Evan competed against first to third-year undergraduate students from Australian and New Zealand universities to win first prize in the Australasian Society for Classical Studies annual undergraduate essay prize. Evan aspires to undertake and complete doctoral research in the field of ancient history and classics, and so become an academic researcher and educator in higher education.

Richard Johnstone is the Foundation Executive Director of the Australian Learning and Teaching Council. A graduate of the University of Newcastle in New South Wales and Cambridge University, Professor Johnstone has lectured in English literature in universities in Australia and the UK and has held a range of senior management positions in higher education. He was Deputy Vice-Chancellor at Charles Sturt University, and held the position of Pro-Vice-Chancellor at both the University of Sydney and the University of Technology, Sydney. Learning and teaching has been a focus for Professor

Johnstone for many years, providing the background for his role as ALTC Executive Director. In the late 1990s, he joined the Committee for University Teaching and Staff Development and was also Deputy Chair of the Australian Universities Teaching Committee from 2000 to 2004.

Sally Kift is Professor of Law at QUT. She has served as Law Faculty Assistant Dean, Teaching & Learning (2001-2006) and QUT's foundational Director, First Year Experience (2006-2007). Sally received a National Teaching Award (AAUT) in 2003. In 2006, she was awarded one of three inaugural Australian Learning and Teaching Council (ALTC) Senior Fellowships for a program entitled: *Articulating a transition pedagogy to scaffold and enhance the first year learning experience in Australian higher education*. In 2007, Sally led a project team to the award of a further ALTC National Teaching Award for the Law Faculty's Assessment and Feedback practices. She has published widely on legal education and student transition, and has received numerous national and international invitations to speak on issues relating to transition and the first year experience, on curriculum design to embed and assess graduate attributes, and on the current state of legal education.

Kerri-Lee Krause is Chair in Higher Education, Director of the Griffith Institute for Higher Education and Dean (Student Outcomes) at Griffith University. Her research expertise and experience spans higher education policy areas, with a particular focus on the changing student experience, the changing nature of academic work and the implications of these changes for university policy and practice. She recently led an ALTC funded study examining the policy and practical implications of teaching-research links in Australian higher education. She was also part of a team that recently completed a funded study entitled *Educating the Net Generation: Implications for learning and teaching in Australian universities* examining how first year university students and their teachers use emerging technologies and tools. A significant part of her work involves providing advice to the sector on implications of her research for managing and responding to the changing student and academic staff experience in higher education.

Philippa Levy is Professor and Director of the Centre for Inquiry-based Learning in the Arts and Social Sciences (CILASS) and a member of the Department of Information Studies at the University of Sheffield, UK. CILASS is a national Centre for Excellence in Teaching and Learning, awarded to Sheffield in 2005. In 2009 she is also leading an institutional research/development project called *The LRT Project: Integrating Learning, Research and Teaching*. Phil's interests are in the areas of inquiry-based pedagogies in higher education, the research/teaching nexus, networked learning and learner support, information literacy, educational roles of information specialists, educational development and change facilitation, space design for learning and teaching, and the scholarship of learning and teaching. She has published widely on these themes. Within CILASS she is currently leading a longitudinal research project focusing on students' experiences of inquiry, and a literature review/synthesis project funded by the UK Higher Education Academy on the topic: *Supporting inquiry-based learning with digital technologies*. In 2006-7 she directed DeSILA, a project funded by the Joint Information Systems Committee, which explored aspects of technology-supported design for inquiry-based learning. She has a long history of involvement in research and development for learning, teaching and learner support in universities, including projects funded by the UK Electronic Libraries Programme and the EU Telematics for Libraries Programme in the 1990s.

Susan Mayson, PhD, teaches both undergraduate and postgraduate students in the Department of Management, Faculty of Business and Economics, Monash University. She has a long-standing interest in teaching and learning issues in higher education including research-led teaching and internationalization of the curriculum and has published a number of articles (with colleague Dr Jan Schapper) in the area of higher education. She, along with Dr Jan Schapper and Dr Glen Croy are active proponents of the Research Skills Development framework and as a consequence of this collaboration, they are about to launch the Business Education Research Network in the Faculty of Business and Economics, Monash University, to champion research and reflection on teaching and learning.

Mick McManus was appointed Deputy Vice-Chancellor and Vice-President (International) (Acting) in January 2009 and prior to this was Executive Dean of the Faculty of Biological and Chemical Sciences at The University of Queensland from 1998. He was initially appointed to the University as Foundation Professor of Pharmacology and from 1993 to 1997 served as Head of the Department of Physiology and Pharmacology. Professor McManus trained as a pharmacist at Curtin University of Technology and completed his PhD in biochemical pharmacology at the University of Western Australia in 1978. He has held research positions at the Royal Postgraduate Medical School in London, Flinders University in Adelaide and at the National Institutes of Health in the USA. He has been the recipient of a Fogarty International Fellowship/Associateship, an Anti-Cancer Foundation Fellowship of the Universities of South Australia, National Health and Medical Research Council Principal Research Fellowship and an International Union Against Cancer Yamagiwa-Yoshida Study Grant. Professor McManus was President of the Australasian Society of Clinical and Experimental Pharmacologists and Toxicologists (ASCEPT) from 2000-2001 and was Chairperson of the 9th International Congress of Toxicology held in Brisbane in 2001. He is currently a member of the Nomination Committee of the International Union of Toxicology. In recent times, he has led the review of the Bachelor of Science degree at UQ and provided major input into a new science, technology, engineering and mathematics (STEM) plan for schools in the State of Queensland. During his time as Executive Dean, Professor McManus was also a member of the Boards of three research institutes, two Cooperative Research Centres, a number of spin-out companies, and was Chair of the Queensland Australian-American Fulbright Awards Committee from 2006 – 2008.

Judyth Sachs is Deputy Vice-Chancellor and Provost at Macquarie University, Sydney. Prior to her appointment at Macquarie, Professor Sachs held various positions at Griffith University, the University of Queensland and the University of Sydney before accepting the role of Pro Vice-Chancellor, Learning and Teaching, at the University of Sydney. She also currently serves on the editorial boards of a range of educational advisory groups in the UK, US and in Hong Kong.

Elaine Seymour was co-founder and, for seventeen years, Director of Ethnography & Evaluation Research (E&ER) at the University of Colorado at Boulder, USA. Her research and evaluation work has focused on issues of change in STEM education and careers, including evaluation of initiatives seeking to improve quality, access, and diversity in these fields. In recognition of her work on women in science, WEPAN awarded her their 2002 Betty Vetter Award for Research. Her best-known work, co-authored with Nancy M. Hewitt, *Talking about leaving: why undergraduates leave the sciences*, (1997), is widely cited for its contribution to the nationwide effort to improve undergraduate education in the sciences. In 2005 she and E&ER members published: *Partners in innovation: teaching assistants in college science courses*, drawing on their science education studies. Professor Seymour has written widely and testified before Congress on trends and needs in the reform of STEM education. Her work has also pioneered and established the value of qualitative inquiry in understanding complex issues in this field.

In response to the learning assessment needs of classroom innovators, Elaine designed two online resources: the Field-Tested Learning Assessment Guide (FLAG),

<http://www.wcer.wisc.edu/archive/cl1/flag/default.asp> and the widely-used Student Assessment of their Learning Gains (SALG) online instrument www.salgsite.org. This is currently being redesigned and expanded, including the addition of URSSA, an assessment instrument for undergraduate research programs. Elaine led E&ER's comparative, longitudinal inquiry into the nature, benefits, and costs of summer research experiences for both students and faculty, and the processes whereby gains are achieved. In addition to articles already published, the findings from this study will be presented as a book (*Undergraduate research in the sciences: engaging students in real science*) by Jossey-Bass early in 2010. In 'retirement' she is helping to organize a national endeavor: *Mobilizing STEM education for a sustainable future*. She is a sociologist and a British-American whose education and career have been conducted on both sides of the Atlantic.

John Rice is Executive Director and immediate past and foundation President of the Australian Council of Deans of Science (ACDS). Formerly Dean of Science at UTS, Professor Rice is Honorary Professor in mathematics at the University of Sydney. A mathematician by training, John has had a distinguished career in science management in Australia. He was formerly Deputy and then Dean of the Faculty of Science and Engineering at Flinders University. John's approach to science management is underpinned by a belief in the need for renewing and re-invigorating the relationship between science, technology and innovation.

Linda Slakey, PhD, joined the National Science Foundation in November 2006 as Director of the Division of Undergraduate Education. She is a graduate of Siena Heights College (B.S. in Chemistry), and the University of Michigan (Ph.D. in Biochemistry.) She did postdoctoral research at the University of Wisconsin. Dr. Slakey was appointed to the faculty of the Department of Biochemistry at the University of Massachusetts Amherst in 1973. Her scientific work focused on lipid metabolism and vascular biology, and was funded by the National Institutes of Health, the American Heart Association, and the National Science Foundation. She was Head of the Department of Biochemistry from 1986 until 1991, and Dean of the College of Natural Sciences and Mathematics (NSM) from 1993 until 2000. In September 2000, she was appointed Dean of Commonwealth College, the honors college of the University of Massachusetts Amherst. As Dean of NSM and of Commonwealth College she was active in supporting teaching and learning initiatives throughout the University, with particular attention to engaging undergraduate students in research, to faculty development activities that promote the transition from lecturing to more engaged pedagogies, and to the support of research on how students learn.

Andrew Wells joined the ARC in February 2009 in the position of Executive Director, Humanities and Creative Arts. Before joining the ARC, Professor Wells was Dean of the Faculty of Arts at the University of Wollongong from 2003-2008. Professor Wells has a strong understanding of the ARC and the humanities and arts sector. He has held four ARC grants and has been a highly active HDR supervisor—with around 25 completions to his credit. Professor Wells has been an active member of the Executive of the Deans of Arts, Social Sciences and Humanities. A graduate of Monash University and the ANU, Professor Wells has taught a wide range of undergraduate and graduate courses in politics, history, economic history, Asian studies and Australian studies at Monash University, Melbourne University, the ANU and the University of Wollongong. He has published widely on Australian economics, and labour and intellectual history. His current research interests concern comparative studies of Australian and South East Asian labour history, most recently focusing on imperial hegemony and colonial labour.

John Willison, PhD, is a lecturer in the Centre for Learning and Professional Development at the University of Adelaide. His principle research interests centre around the ways that academics conceptualise and implement the explicit development of their students' research skills within undergraduate and masters by coursework curricula. Dr Willison leads a five-university project, funded by the Australian Learning and Teaching Council, called *Research Skill Development (RSD) and Assessment in the Curriculum*. The conceptual model for this project, the RSD framework, is currently being utilised in Canada, Holland, Iran, Ireland, South Africa and the United States of America. A thread of current interest concerns the explicit and coherent development of research skills from First Year University to PhD and towards early career researchers.

Denise Wood, PhD, is a Senior Lecturer in the Bachelor of Media Arts program at the University of South Australia. She is also the Teaching and Portfolio Leader of the School of Communication, International Studies and Languages, a member of the Division of Education, Arts and Social Sciences Teaching and Learning Committee as well as Co-Chair of the Division's Equity Committee. Her teaching focuses on Web design and interactive media with a particular interest in accessibility and usability. She uses a range of methodologies to enhance student engagement including practice based and service learning, reflective practice through collaborative peer review and assessment, and research activities to encourage problem solving and deep learning. Some of the techniques she's been trialing include Web 2.0 technologies such as 3D virtual simulations, blogs, podcasting, audience response systems (in lectures) and interactive simulations. She is the recipient of a number of teaching awards and ALTC grants and projects including research projects addressing the impact of technology in education which she has published in a number of peer reviewed journal papers and book chapters. She is a principal investigator in two nationally funded research projects and a co-researcher in several other research projects relating to the use of technology and 3D virtual worlds for online learning and teaching.

Brian Yates has been Head of the School of Chemistry at UTAS since 2006. Following a PhD at the Australian National University, Professor Yates completed postdoctoral work at the University of California, Berkeley and the University of Georgia before taking up an academic position at the University of Tasmania in 1989. Brian's interest and commitment to teaching began with a DipEd in 1982, and following his appointment as an academic in 1989, he has built up a strong reputation for teaching excellence. He has taught across a range of units in years 1-4 of undergraduate chemistry, he has been involved in a number of competitively funded teaching development projects at the national (CAUT/CUTSD/Carrick/ALTC) and state (UTAS) levels, and he has been rewarded with Teaching Merit Certificates and a Teaching Excellence Award from the University of Tasmania, and a National Teaching Excellence Award from the ALTC. Professor Yates also has a strong research reputation in computational chemistry and he has established an active research group in this area, as well as fostering close collaborations with a number of experimental chemists. His research is funded by the ARC. His research interests are broad and focus on computational and physical chemistry but with applications to organometallic and organic chemistry. Brian has had an ongoing commitment to combining his teaching and research interests and in involving undergraduate students in research and inquiry activities.

BACKGROUND TO THE FIRST AUSTRALIAN SUMMIT ON THE INTEGRATION OF RESEARCH, TEACHING AND LEARNING

Enhancing undergraduate engagement through research and inquiry

Public funding should be directed only to those institutions that: encourage both students and staff to engage in critical enquiry... (Bradley Review Report, page 7).

Self-fulfillment, personal development and the pursuit of knowledge as an end in itself, the provision of skills of critical analysis and independent thought to support full participation in a civil society; the preparation of leaders for diverse, global environments; and support for a highly productive and professional labour force should be key features of Australian higher education. (Transforming Australia's Higher Education System)

The path I am setting out ... raises the expectations we have of our young people and their parents and of our great institutions. It asks them to be bolder and more ambitious in what can and should be achieved. (Hon Julia Gillard, MP 4th March 2009)

What must higher education do to prepare students for the complex and challenging decisions that they are likely to encounter throughout their lives? An improved understanding of how students learn in higher education has shifted attention away from the lecture course as the predominant form of university teaching to more diverse and active course offerings. However, there is still a mismatch between the kind of education being provided and the kind of outcomes for students that universities need to produce. Students need not simply to be able to use existing knowledge however cutting edge it may be. In the work of organisations everywhere knowledge is now produced as a normal part of contemporary activity. Higher education needs to teach all students, not just research students, to engage as much in the production of knowledge as in its acquisition.

The demands of today's society require higher education to open up to creative solutions, to the generation and acquisition of new kinds of knowledge; to new kinds of thinking. 'What is required' says Barnett (1997, p. 110), 'is not that students become masters of bodies of thought, but that they are enabled to begin to experience the space and challenge of open, critical inquiry (in all its personal and interpersonal aspects)'. This is not just for those who choose to pursue an academic career. Today's society demands resourcefulness and creativity and the ability to deal with complexity and uncertainty. We need new ways to engage students in the joy and excitement of learning to meet this agenda.

There is mounting evidence of the value of undergraduate research and inquiry in meeting these challenges; in developing in students the ability to investigate problems, to critically evaluate knowledge, to make rational judgments in the light of good evidence; evidence that they perhaps gather, to understand and reflect on what they are doing and why (Blackmore & Cousin, 2003; Healey, 2005, Hunter, Laursen & Seymour, 2006; Levy & Petruilis, 2007; Seymour, Hunter, Laursen & Deantoni, 2004). Engaging undergraduate students in research and inquiry, develops important graduate attributes, engages students meaningfully in higher education and prepares them for a twenty-first century world of work in which knowing how to inquire and critically evaluate knowledge is of increasing importance. Research and inquiry are central to contemporary professional life as well as to the development of capabilities associated with participation and justice in a democratic society.

Moves to evidence-based teaching and learning including problem based learning, and increasing development and use of research-based curricula are indications of a move towards research-based

teaching in Australian higher education. Many students are now being encouraged to engage in 'research tasters' such as carrying out research for an assessment, or exploring how academic teachers generate research in a particular discipline (Brew 2006 p. 70). Some forms of undergraduate research and inquiry focus on students solving predetermined problems, developing knowledge which is new for them, but which is well known by experts in the subject. Other forms involve students in developing new knowledge where they may work on unforeseen, open-ended problems alongside experts. If students are to be encouraged to develop the ability to deal with the complexity and ambiguity of knowledge generation, then it is this kind of research and inquiry that they must increasingly be engaged in. Academics typically learn through a process of engaging in collaborative research groups and through peer review (Brew & Boud, 1995). Involving undergraduates in such processes can only enhance their learning and engagement in study.

But can or should undergraduate students become part of the community of researchers and scholars in the university? There are many different views on this. The National Science Foundation in the US, for example, views undergraduate research as a vital part of the nation's research effort (National Science Foundation, 2001). Some Canadian research councils also fund undergraduate research to this end and in the UK the government has invested some 40 million pounds to develop 'research-informed teaching'. Engaging undergraduate students in research is seen not only to benefit student learning, but also to benefit universities' research efforts and staff engagement. A survey of undergraduate research scholarship schemes in Australia currently being carried out, has found that while there are many small-scale initiatives in a number of departments, these are not well advertised or known outside of the immediate context (Jewell, 2009).

A number of structural and attitudinal barriers work against the inclusion of undergraduate students in research as it is currently defined in universities. These include hierarchical organisational structures and values conflicts that define undergraduate students as 'other', ways in which power operates to preserve research for the elite (including the higher year students and postgraduates) as if it were a kind of reward for hard work; thus excluding most undergraduates. If students are to engage in learning through research and inquiry and to contribute to the research effort of universities, there is a need to explore and discuss within university departments, attitudes that support and sustain particular views of research and teaching and views of students and what they are capable of. Evidence suggests that many undergraduate students find themselves alienated from the research culture and there is variation in the extent to which students consider themselves part of the research community (Lindsay, Breen, & Jenkins, 2002). Robertson & Blackler's (2006) study shows disciplinary differences in this regard. Students who become research associates when engaged in undergraduate research schemes are reported to feel part of the research community. They are treated as junior colleagues rather than just 'students' engaged in courses. Their relationship with academics changes to a more inclusive one (Blackmore & Cousin, 2003; Seymour, *et al.* 2004).

Committee and performance management structures that separate considerations of teaching and research, restrictive definitions of research and ideas about who is capable of doing it (Colbeck, 1998) work against the integration of undergraduates into research and inquiry. There are also systemic and policy structures which go beyond individual universities. Key aspects are the attitudes and objectives of research funding bodies. In contrast to the US where undergraduate research is an accepted part of the national research effort, here, there is a need for national debates about the role of undergraduate research in the Australian research funding system. The summit provides opportunities to examine policy and practice in terms of the need to set as goals the interrelationship of students as participating scholars and to break down barriers to this. International experts will contribute valuable ideas and experiences to enhance these debates.

If we are serious about engaging students in research and inquiry, as I have argued we must be if we are to meet the needs of students for professional life in the twenty-first century, we need opportunities where the assumptions of academics, academic managers and policy-makers about what students are and are not capable of can be debated. We need mechanisms to fund undergraduate student research and to reward academics who involve their students in it. We also need ideas, models resources and protocols which assist in developing pedagogical practices that structure knowledge and learning in new ways; and we need to discuss and debate new ideas about who should do research and who should not, about how teaching and research should be organised, about the kinds of learning support and resources that should be provided for students, about the ways undergraduate research should be funded, and about how existing teaching and learning spaces are used and new ones developed.

Angela Brew
November 2009

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ABOUT THE ALTC NATIONAL TEACHING FELLOWSHIP

The Summit is organised under the auspices of the ALTC National Teaching Fellowship of Professor Angela Brew of the Learning and Teaching Centre at Macquarie University.

The overall aim of the Fellowship is to enhance student engagement in learning through supporting the development in Australia of undergraduate research and inquiry.

Intended outcomes

1. Identify national needs in terms of moving forward practice in engaging undergraduate students in research and inquiry. This is being done through:
 - a. *Study tours* including visiting key institutions in the US, UK and The Netherlands.
 - b. An undergraduate research scholarship focused on investigating the extent of existing practice in undergraduate research scholarship schemes in Australia and identifying sources of funding used for student stipends in such schemes.
 - c. Presentations at various events
 - d. A National and International team of expert collaborators has been assembled for the Fellowship Program. An Extended Team is also being identified during the Program who are involved in suggesting and trialling resources, models and protocols and contributing to Roundtables.
2. Establish and trial a set of readily available resources and protocols designed to bridge gaps between current and future practice.
 - a. A range of models, resources, potential and actual protocols is being consolidated and adapted for use in the Australian context. The resources are being entered into the Undergraduate Research in Australia Website at: <http://www.undergraduateresearchAustralia.com> and these are being disseminated through Regional Roundtable discussions.
 - b. Regional Roundtables to bring together on a State-wide basis, members of the National Team, the Extended network, and interested academics are being held in New South Wales and the ACT (23rd September); Tasmania (8th October); Victoria (15th October); Queensland (16th October) and South Australia (10th November).
3. Enhance debates concerning engagement of undergraduate students in research and inquiry by bringing together academics, academic managers, and policy makers with international and national experts.
 - a. This Australian Summit on the Integration of Research, Teaching and Learning is a key strategy for this as well as the regional roundtables.
 - b. Presentations by the Fellow in numerous forums, universities, and conferences
4. Provide the foundation for the establishment of a National Centre for the Integration of Research, Teaching and Learning.

SUMMIT EVALUATION [Please complete and then tear this page out of the booklet and place in the evaluations box on leaving]

First Australian Summit on the Integration of Research, Teaching and Learning

EVALUATION

What was the most useful, or meaningful, thing you gained during this Summit?

What questions remain uppermost in your mind at the end of this Summit?

Will you change anything as a consequence of being at the Summit?

What activities, events, resources would assist you and your colleagues to integrate research, teaching and learning in the future?

What activities, events, resources would assist you and your colleagues to develop undergraduate research in the future?

Further comments

Thank you for taking the time to give us some feedback.

Please tell us which university you are from.....

