

**Research and
Research Training
Management Report
2005**

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|--|-----------|
| PART A | 3 |
| 1 USE OF RESEARCH BLOCK GRANTS AND SCHOLARSHIPS | 3 |
| 1.1 ALLOCATION OF IGS AND RIBG | 3 |
| 1.2 ALLOCATION OF RTS FUNDING AND PLACES | 3 |
| 1.3 RESEARCH SCHOLARSHIPS – COMMONWEALTH AND UWS | 4 |
| 1.4 REWARDING RESEARCH PERFORMANCE..... | 5 |
| 1.5 REVIEW OF INTERNAL ALLOCATION..... | 5 |
| 2. MANAGING RESEARCH PERFORMANCE | 6 |
| 2.1 PLANNING AND SUPPORT PROCESSES | 6 |
| 2.2 RESOURCE ALLOCATION PROCEDURES | 7 |
| 2.3 PERFORMANCE MONITORING ARRANGEMENT AND BENCHMARKING..... | 7 |
| 2.4 RESEARCH PERFORMANCE AND REWARD..... | 9 |
| 2.6 RESEARCH STRENGTHS..... | 10 |
| 2.7 BENCHMARKED PERFORMANCE..... | 8 |
| 3. RESEARCH AND RESEARCH TRAINING OBJECTIVES | 12 |
| 3.1 STRATEGIC GOALS..... | 12 |
| 3.2 MEASURING PERFORMANCE AGAINST OBJECTIVES | 12 |
| 4. ENSURING A QUALITY RESEARCH TRAINING EXPERIENCE | 13 |
| 4.1 OVERVIEW | 13 |
| 4.2 ACCESS TO RESOURCES..... | 13 |
| 4.3 SUPERVISORY LOAD AND PANELS | 14 |
| 4.4 SUPERVISOR DEVELOPMENT AND QUALITY ASSURANCE | 14 |
| 4.5 STUDENT GRIEVANCES | 14 |
| 4.6 STUDENT DEVELOPMENT..... | 15 |
| 4.8 MEASURES OF ACHIEVEMENT – STUDENT PROGRESS..... | 15 |
| 4.9 CONFIRMATION OF CANDIDATURE..... | 15 |
| 4.10 RESEARCH COMPLETIONS..... | 15 |
| 4.10 RECENT ACHIEVEMENTS..... | 16 |
| 5. COLLABORATION AND PARTNERSHIPS | 16 |
| 5.1 RESEARCH PARTNERSHIPS | 16 |
| 5.1 NATIONAL RESEARCH PRIORITIES | 19 |
| 6. IP, COMMERCIALISATION AND CONTRACTUAL ARRANGEMENTS | 19 |
| 6.1 COMMERCIAL ACTIVITY AND INTELLECTUAL PROPERTY..... | 19 |
| 6.2 COMMERCIALISATION STRATEGIES | 20 |
| 6.3 RECENT ACHIEVEMENTS..... | 21 |
| TABLE 1: HIGHER DEGREE RESEARCH (HDR) STUDENTS (BY EFTSL) IN 2004 | 23 |
| TABLE 2: RESEARCH INCOME IN 2004 | 24 |
| TABLE 3: RESEARCH ACTIVE STAFF IN 2004 | 24 |
| TABLE 4: QUALIFICATIONS AND ACTIVITY OF STAFF WHO SUPERVISED HDR STUDENTS IN 2004 | 24 |
| VICE-CHANCELLOR’S CERTIFICATION STATEMENT | 27 |
| APPENDIX A | |
| UWS RESEARCH CONCENTRATIONS 2005 | 28 |
| APPENDIX B..... | 29 |

UWS research is inter-disciplinary and collaborative in style, and will continue to develop along substantially professional and applied lines. UWS is developing a distinctive research culture that encourages synergies across disciplines and collaboration among students, researchers and colleagues in industry, government and the community.

Contact: Mr Gar Jones, Director, Research Services
University of Western Sydney
Locked Bag 1797
Penrith South DC NSW 1797

Part A

1 Use of Research Block Grants and Scholarships

1.1 Allocation of IGS and RIBG

Annually, UWS receives significant research funding through the Commonwealth's core research performance funding mechanisms: the Institutional Grants Scheme (IGS), Research Infrastructure Block Grants (RIBG) and the Research Training Scheme (RTS). UWS ensures that all such Commonwealth performance based funding is used flexibly and with strategic intent, reflecting its desire to consolidate its contribution to the national innovation system, while continuing with its strong focus on selectivity and concentration and actively rewarding high quality research performance within UWS.

The bulk of IGS funding is currently returned to Colleges on the basis of actual performance. UWS has developed broad guidelines for the expenditure of IGS which assist Colleges to think strategically about the use of these important development funds. In 2004, 11 per cent of the total IGS received by UWS (\$3,415,916) was held centrally for strategic research initiatives. These included a strategy for supporting Visiting International Fellows and other international exchange as well as the development of a range of new initiatives linked to the outcomes of the UWS *Themes in the Landscape* research review which was finalised in 2004. The majority of the remaining IGS funding (89%) is returned to Colleges on the basis of actual funding generated by individual researchers formally associated with each University Research Centre (100% return); Other Research Groups hosted by Colleges (80% return); Individual Researchers within Colleges not formally associated with either a Research Centre or Research Group (80% return). Colleges then strategically allocate these funds to schools and research centres on the basis of actual performance, generally holding back a small portion for specific research initiatives.

All 2004 RIBG funding (\$1,425,752) was allocated to Colleges on (a) the basis of actual research performance and (b) implementation of the DEST guidelines on expenditure categories. The performance return to University Research Centres (URC) is strong, with over 56 per cent of the funding strengthening such research concentrations, particularly through the employment of key technical and research staff as well as the purchase and maintenance of computer equipment.

UWS has developed a guide for Colleges on the appropriate and strategic expenditure of Research Block Funding, called the UWS Guide to DEST Performance funding expenditure - <http://www.uws.edu.au/about/adminorg/devint/ors/managementpolicies>.

In 2004, the broad expenditure of IGS and RIBG was as follows:

| 2004 expenditure – Categories % | IGS | RIBG |
|---------------------------------|---------------|---------------|
| Salaries | 1.751 million | 0.810 million |
| Equipment | | 0.413 million |
| Consumables | 1.502 million | 0.354 million |
| Travel | 0.370 million | 0.065 million |

1.2 Allocation of RTS funding and places

The Research Training Scheme (RTS) aims to recognise and reward those institutions that provide high-quality research training environments and support excellent and diverse research activities. The objectives of the RTS are to:

- enhance the quality of research training provision in Australia
- improve the responsiveness of institutions to the needs of their students
- encourage institutions to develop their own research training profiles
- ensure the relevance of research degree programmes to labour market requirements and
- improve the efficiency and effectiveness of research training.¹

¹ DETYA (2001) *Research Training Scheme, Guidelines*, p. 2.

The Research Training Scheme is a discrete component of the University's operating grant. In 2004, the allocation of RTS to UWS was \$8,360,097. Previously such funding was an assumed component of the operating grant. Under the White Paper reforms, UWS is now able to allocate this component of its operating grant specifically to support and enhance its research training environment.

UWS employs RTS funding to: build an attractive research environment founded on dedicated funding for research students; overcome research infrastructure deficiencies; reward academic units within UWS whose students are successfully completing research study; ensure that financial support for research training is highlighted within the UWS budget process; ensure research students are linked to areas of research strength. In 2004 over 60 per cent of the RTS was distributed to Colleges on the basis of share of Higher Degree Research (HDR) load and HDR completions, while approximately 33 per cent of the RTS funds are devoted to an extensive stipend scholarships program and 7 per cent to the Library for specific research student support activities.

The UWS Research Studies Committee examines expenditure of funding to ensure research student candidature needs are being met. The following table articulates college expenditure of RTS funds.

| 2004 College expenditure | RTS |
|--------------------------------|-----------|
| ▪ Academic Salaries | 2,903,155 |
| ▪ Other Salaries | 235,482 |
| ▪ Major Equipment | 18,526 |
| ▪ Minor Equipment | 209,454 |
| ▪ Consumables | 349,914 |
| ▪ Travel/Conference Attendance | 260,461 |
| ▪ HDR Scholarships | 288,838 |
| ▪ Other | 585,621 |

Across the UWS Colleges, approximately 60 per cent of the RTS was allocated to academic salaries for those individuals undertaking significant HDR supervision, while approximately 40% was expended on specific research student candidature needs. Under this category, the dollar allocation per student for 2004 was just over \$2,000, in line with University recommended norms, though allocations varied significantly across the colleges, ranging from a low \$1,374 per student to a high of \$3,747. The Research Studies Committee has asked Associate Deans, Research to ensure the average expenditure of candidature needs does not fall below the minimum of \$2,000 per student.

Since early 2000, UWS has allocated all research places centrally through the UWS Research Studies Committee. In this process the quality of the student has been paramount, coupled with availability of resources, linkage with an area of research strength, and a thorough examination of the supervisory arrangements, particularly current load and completions track record of the nominated principal supervisor.

1.3 Research Scholarships – Commonwealth and UWS

UWS has a limited number of Higher Degree Research (HDR) scholarships to award and a limited number of RTS places to offer. UWS therefore seeks to attract the best students possible, while supporting its desire to significantly enhance its nationally competitive research concentrations. Research student scholarships funded through the Commonwealth - Australian Postgraduate Awards (APA) and *Endeavour* International Postgraduate Research Scholarships (IPRS) - are allocated on academic merit as defined by undergraduate GPA, BHons or postgraduate qualification and research output. UWS also employs a third of its RTS allocation centrally to fund a series of UWS Postgraduate Research Awards. All stipend scholarships are allocated centrally through the UWS Research Studies Committee.

Virtually all commencing HDR load in 2005 relates to those individuals who competed successfully for 64 HDR scholarships funded through Commonwealth and UWS awards. This reflects the strategic intent of UWS to ensure that the number of research students in receipt of stipend scholarship support should continue to rise. In 2004, 34 per cent of all research students were in receipt of stipend scholarships support (317 scholarship holders), up from 28 per cent in 2002 (275 scholarship holders).

In the period 2002 to 2008, priority stipend scholarships (\$28,000 per annum) have been allocated to University Research Centres to assist the University in its plan to ensure 50 per cent of its research student load is linked to university concentrations by 2008. A recent analysis of the 2005 APA allocations shows that many of the best students are applying to enrol in areas of concentration and successfully competing for APA scholarships.

In 2004 the UWS Research Studies Committee revised the ranking metric used to determine the allocation of UWS awards in order to include criteria that advantaged applicants (a) intending to enrol in areas of research concentration and (b) those whose projects were aligned with the University Strategic plan. The weight of the research concentration is determined by a ranking metric and judged uniformly across UWS. Maximum points are given to applicants enrolling in URC, with a lesser number of points allocated for enrolment in College Research Group. In addition to academic merit, the strategic aims of UWS research are: regional engagement, interdisciplinary focus, collaboration with industry/government/community, commercialisation opportunities and international linkages. Applications are given points where it can be demonstrated that the thesis topic complies with these aims. Some applicants were able to claim congruence with more than one strategic aim. Analysis of the successful 2004 applications indicated those scoring well for alignment with a research concentration and strategic aims were more likely to be allocated a scholarship.

Under this revised selection process, applicants applying to study within University Research Centres (URC) achieved a 73 per cent success rate, as opposed to a 41 per cent success rate overall.

1.4 Rewarding research performance

The UWS budget process allocates a significant portion of operating grant funding to Colleges on the basis of research performance. In 2004, \$11,330,000 was allocated on the basis of share of external research income (audited), share of HDR completions and share of DEST declared publications (audited). Performance is averaged across a rolling triennium – the 2005 budget allocation reflects audited data in the period 2001-2003 – see 2.4 below.

1.5 Review of internal allocation

Given the emergence of an Australian Research Quality Framework (RQF) and the increasingly competitive nature of the research funding climate, UWS is examining how it might allocate new or augmented streams of performance based funding that will be distributed on the basis of quality, as opposed to national share of research income, publications, student load, and completions. UWS is also reviewing research workload allocations, seeking to manage this large scale internal budget resource more consistently across the Colleges. The aim is to ensure a transparent approach that secures appropriate research workloads for all research active staff, particularly those successfully competing for major external funding. Greater central management of this resource will allow competitive researchers to manage their current research commitments effectively while developing further capacity as the University expands its research achievements and research investment.

As part of the Review of Research in 2004, UWS announced the introduction during 2005 of a centrally managed competitive infrastructure scheme with an allocation of at least \$800,000 per annum. UWS will undertake a greater allocation of RIBG and IGS centrally to ensure infrastructure and development activity links effectively to the University strategic research directions.

UWS is committed to making effective use of its growing research income streams, ensuring effective compliance with Board of Trustees direction that research funds must be actively consumed. In 2004, UWS continued to monitor the effectiveness of its allowable carry-forward process for research performance funds (IGS and RIBG) to ensure that unspent, uncommitted funds above an allowable carry-forward can be retrieved and reallocated on a competitive and strategic basis for research infrastructure and development needs. In 2004 this framework has achieved positive results with the allowable carry forward of 30 per cent being observed by all Colleges.

It is anticipated that in 2006 and following a great proportion of IGS and RIBG will be held centrally for strategic allocation.

2. Managing Research Performance

The Pro Vice-Chancellor (Research), Dean of Research Studies, Director of Research Services and the UWS Research Committee and UWS Research Studies Committee undertake central planning for research and research training at UWS. The PVC(R) is a member of the Vice Chancellor's Advisory Committee (VC, DVCs, Deans and PVCs). The VC reports to the Board of Trustees, who endorse the University's broad strategic directions. In April 2005 the Board of Trustees reaffirmed its commitment to UWS's significant engagement in research – confirming that research is part of the 'core business' of UWS, especially research of applied, professional and problem-solving kinds, particularly as this is an important part of what drives growth and innovation within the Greater Western Sydney region. This commitment involves further substantial investment over the next decade to fast-track the development of new research areas and consolidate existing areas of national competitiveness, involving an investment of \$50 million.

http://apps.uws.edu.au/media/news/index.phtml?act=view&story_id=1172 This investment strategy will be led by the DVC (D&I) and the PVC(R).

2.1 Planning and support processes

The governance of research at UWS is the responsibility of two Academic Senate Committees, the Research Committee and the Research Studies Committee. The Pro Vice-Chancellor (Research) provides overall research leadership, particularly ensuring that the chosen research policies and direction for the University are met. A Dean of Research Studies² provides leadership for UWS Research Training programs and chairs the Research Studies Committee. The PVC (R) reports to the Deputy Vice Chancellor, Development and International, thus ensuring the integration of research development and consolidation strategies within the overall portfolio of University planning, governance and leadership.

Office of Research Services

Research Services provides integrated administrative and management support for researchers and research activity across UWS, with a strong focus on research development, income generation, ethical review and the coordination of research student training and development.

Colleges and Schools

UWS is in the process of undertaking further restructure of its core academic units. In 2006, UWS will realign its College and School structure. This will involve a reduction in Colleges from 4 to 3 and from 20 schools to 16.

The purpose of the realignment of the Colleges and Schools is to provide an academic framework that is sustainable and provides a platform for future growth and competitiveness in a rapidly changing sector. The structural reform is designed to: develop stronger more responsive schools that are financially viable and able to respond to an increasingly competitive external environment; respond to the formation of a Medical School, which provides UWS with an opportunity to make a major contribution to multidisciplinary health care in Greater Western Sydney, by aligning health, medical and biological teaching and research; ensure greater academic alignment, bringing similar groups of staff in the same or cognate disciplines together in the same School. Larger more focussed schools will have a greater capacity to provide a teaching program, underpinned by research, and supporting community engagement.

In the UWS structure, Colleges have a responsibility to support research groups and individual researchers, particularly early career researchers not associated with centrally funded research concentrations. Significant external and internal research funding is allocated to Colleges to support them in this development role. Through the University Funding Model (UFM) they receive

² This position is currently vacant.

substantial funding based on research performance as well as a competitive share of IGS, RTS and RIBG funding.

Each College has a Board of Studies with a Research Committee. Colleges have also appointed an Associate Dean, Research to undertake a key leadership role, focussing on the strategic development of research, the management of research processes, and the oversight of research training. Working closely with the Dean and the College Executive, the Associate Dean (Research) liaises with Heads of School, the Pro Vice Chancellor (Research), the Director and other staff from Research Services and the relevant committees of the College, while intersecting with Academic Senate and the Board of Studies, to foster and promote the development of research activity within the College. This pivotal role allows UWS to implement its broad research objectives more systematically.

The Pro Vice Chancellor (Research), Dean of Research Studies and Director of Research Services meet regularly with the Associate Deans to ensure the University's strategic imperatives are articulated.

2.2 Resource Allocation procedures

Resource allocation to research development and consolidation is a key component of the University Funding Model (UFM). UWS has a budget allocation model that provides significant support for research, as well as linking to the University's strategic goals. Research imperatives driving this model are (a) improving overall research performance (b) performance incentives to reward Colleges for research achievement/activity (c) targeted support for UWS research concentrations and (d) targeted funding to improve the quality of research training at UWS. Under the UFM, the UWS Research Budget currently consists of 4 components:

- external research income
- targeted DEST programs - IGS, RTS and RIBG
- a central development component
- a major performance reward under the academic allocations to Colleges (9% of College allocations).

Of this ongoing investment by UWS in building and consolidating its research capacity, the central development component is designed to support and reinforce the University's strategic objectives and includes the following broad programs (2004 data):

| | | |
|---|---|-----------------|
| ▪ Research Centres - Development | <i>Competitive allocation following external review</i> | \$3.225 million |
| ▪ Internal Grants Schemes | <i>Competitive allocation to individuals and groups</i> | \$1.000 million |
| ▪ Postdoctoral Fellows | <i>Competitive allocation to Colleges</i> | \$0.750 million |
| ▪ External Collaboration & Other | <i>CRC; Infrastructure & Equipment; Other</i> | \$0.700 million |

This investment in excellence, development, collaboration, and training constitutes just under 3 per cent of the University's operating grant. In 2006 this internal allocation will be doubled, to fund a range of consolidation and development strategies linked to the University's focus on selectivity/concentration and research themes.

2.3 Performance monitoring arrangement and benchmarking

UWS has actively monitored its research performance over the last decade, on both an annual and triennial basis, and seeks where possible to benchmark performance against sectoral trends. UWS has integrated several performance measures into its research planning. Many of these mirror the McKinnon, Walker & Davis, *Benchmarking, A manual for Australian Universities*. In particular:

McKinnon Benchmarking used or modified by UWS:

- 8.6 Research income trends
- 8.2 Proportion of academic staff holding external research grants
- 8.8 Weighted research publications per academic FTE
- 8.5 Research higher degree completions per academic FTE
- 8.3 Proportion of academic staff with direct involvement in research activity

UWS regularly reviews its internal research support to ensure that programs are meeting strategic objectives and are a positive investment for the University. Return on Investment (ROI) and risk management (including succession) are significant planning imperatives. This entails the regular review of performance of individuals and groups supported by internal income to ensure a positive return on investment. Research concentrations are reviewed annually by the UWS Research Committee. Formal external review of University supported Research Centres is undertaken as outlined in Section 3 below as part of the University's strategic research planning. UWS commits significant resources to such processes, recruiting outstanding external scholars/researchers and industry players to provide expert advice and review.

In 2004 UWS reviewed all its internal support mechanisms, covering both the funding for University Research Centres and the targeted competitive grants schemes it provides from operating funds, in order to ensure that programs are meeting strategic objectives and are a positive investment for the University.

Specifically, in 2004, the targeted, and competitive internal funding schemes that UWS had adopted in its integration phase (2001) were rigorously reviewed and found to be working effectively to develop new researchers and research track records and to support the attraction of external research income through competitive grants and collaboration. Responding to the Strategic Plan for Research and the 2004 review, the mix has been shifted towards the Partnerships program, which has been particularly effective in supporting the University's above sector average success in ARC Linkage grants. Collaborating partners have come from business, industry, public and community sectors. Researchers awarded Partnership Grants have made 22 ARC Linkage applications and been awarded 12 ARC Linkage grants.

Many successful Discovery and Linkage projects have grown from internal investment in research concentrations. The University invested significant funds (approximately \$3 million p.a. in 2002-2004) from its central research budget in research support to a small number of URC, provided primarily as scholarships and postdoctoral fellowships, research program co-ordinators, commercialisation advice and equipment funds. There has been further support for UWS participation in Cooperative Research Centres (CRC) and for UWS participation in other collaborations including infrastructure development. As a counterbalance to this strong investment in particular niche areas and a means of nurturing future research growth, the University has operated competitive research grant schemes targeted at particular career cohorts and research modes.

Benchmarked Performance

Benchmarks per academic FTE (2000-2003 data)

| UWS | 2000 | 2001 | 2002 | 2003 | 2004 |
|----------------------------------|----------|----------|----------|----------|----------|
| Research Income per Academic FTE | \$10,727 | \$10,657 | \$11,217 | \$12,195 | \$10,867 |
| Publications per Academic FTE | 0.46 | 0.52 | 0.70 | 0.87 | 0.93 |
| HDR Completions per Academic FTE | 0.10 | 0.10 | 0.12 | 0.14 | 0.11 |
| HDR Completions per HDR load | 0.13 | 0.14 | 0.18 | 0.22 | 0.17 |

2004 provided a mixed report card in terms of research performance. Research income fell in 2004, though success rates for funding applications continued to rise as did the average size, per year of the funds awarded. In 2004 a number of senior researchers departed from UWS – including 42 per cent of the top 12 research grantees working in UWS during the period 2001-2003. In 2004, research publication output continued its strong rise, and for the first time, a majority of UWS academic staff authored refereed publications in the calendar year. After dramatic growth in research completions across the period 2001-2003, completions in 2004 stabilised at 100 – back to the levels achieved in 2001. This rise and fall, reflects the significant energies expended within UWS on successfully completing a large cohort of students whose progress had been reviewed in 2001.

2.4 Research Performance and Reward

In managing research performance UWS is aware of the need to provide incentives and reward at both the structural and individual level. It has been agreed as part of the University Funding Model (UFM), that a specific amount of the academic allocations to Colleges will be on the basis of research performance. Since 2003, the quantum of performance incentive funding that rewards research achievement within Colleges has been set at 9 per cent. UWS considers this model to be simple; transparent; in line with the University's performances measures for the Register of Research Activity; and it is averaged over a three year period to iron out sudden changes in performance. It is designed to provide funding that encourages Colleges and, through them, Schools to invest in research development; and to action the effective allocation of academic time (one of our core research resources) through the workload agreements, in order to support productive research activity.

The model uses the following input and output measures, equally weighted.

| | |
|--------|--|
| INPUT | - share of external research income registered through Research Services |
| OUTPUT | - share of declared DEST refereed publications, registered through Research Services |
| OUTPUT | - share of Higher Degree Research (HDR) completions reported to DEST |

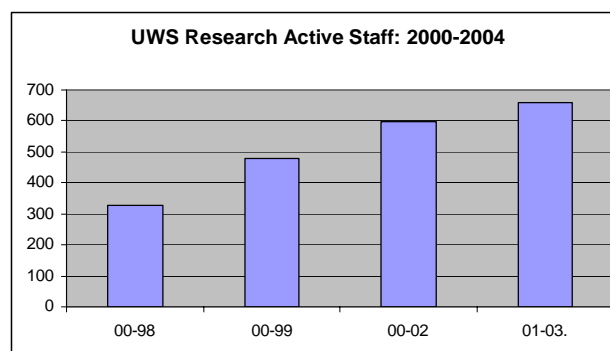
UWS is currently reviewing this model with an eye to tying expenditure of these funds more closely to supporting the University's strategic research ambitions both within and across Colleges.

Within its strong framework of selectivity and concentration, UWS has not lost sight of the need to also support high achieving individuals. The Register of Research Activity is designed to provide a framework within which research active staff can be rewarded through:

- priority access to UWS internal research funding schemes
- access to Higher Degree Research supervisory opportunities
- their achievements promoted to external communities and agencies.

http://www.uws.edu.au/about/adminorg/devint/ors/activitystrengths/research_active_register#1

The UWS Register of Research Activity uses DEST recognised research activity measures: external research income, publications and research student completions. The UWS Research Committee monitors the threshold levels of activity for each of these measures annually in order to respond to the University's improving research performance. In the latest iteration of the Register, based on 2001-2003 data 645 staff registered audited performance on either publication outputs, external research income or successful supervision of a completed HDR candidature. The number of UWS staff who fully qualified on the register also continues to rise annually (262 staff in 2004 – see Table 3, Column 1), in line with Board of Trustees Strategic targets.



2.5 Conflict of Interest Policies

The University has a staff Code of Conduct – see <http://www.uws.edu.au/uws/policies/ppm/doc/000072.html> – which is issued to all staff on appointment and is required to be read and signed by each new staff member. Staff members are also taken through key aspects of the code of conduct during their induction process. The Code of Conduct deals specifically with the requirement to avoid any situation where a conflict of interest arises between the staff member and their role as an employee of the University.

In 2004, the UWS Research Code of Practice was developed and endorsed by the Executive and Senate in accordance with the University's commitment to research and the pursuit of knowledge as

vital institutional functions to be pursued in accordance with the highest standards of professional conduct <http://apps.uws.edu.au/uws/policies/ppm/doc/000166.html> A hard copy of the Code was distributed to staff in 2005.

The UWS Integrity in Research Committee was established in 2005 to provide advice to the Vice-Chancellor on issues of integrity in research as well as confidential advice to both staff and student on ethical issues in research matter, including potential conflict of interest in funding and sponsorship.

2.6 Research Strengths

Over the last decade, despite its relatively modest capacity in comparison with longer established research institutions, UWS has sought to develop and consolidate its contribution to several academic fields of study and to the nation's knowledge base. Through rapid growth from a very low base, UWS has developed a series of research strengths that compete effectively in the national arena. These are often linked, multidisciplinary activities with a strong applied focus. Much of the research these centres undertake has a collaborative problem-solving approach, and is conducted with a wide range of research partners

In 2004, UWS embarked on a major external review of research concentrations and the review of all central research support mechanisms, fulfilling a major objective of the Strategic Research Plan. The outcomes were published in late 2004 as the *Themes in the Landscape* report - <http://apps.uws.edu.au/uws/policies/ppm/doc/000166.html> The review examined the policies applying to the management and support of research centres as well as the performance and strategic alignment of University Research Centres. As part of UWS's ongoing commitment to quality assurance, the performance level for University Research Centre (URC) designation continues to be raised reflecting the application of national and international benchmarking. The designation of a significantly smaller number of centres in the next four years of research development (2005-2008) foresees larger University Research Centres, and a funding regime in which such centres become self-sustaining on the basis of their own performance. This will allow UWS to boost resources to emerging research strengths in the Colleges as well as to direct resources to the renewal of research infrastructure.

As a result of the review process, UWS has 7 University Research Centres (URC),

| | |
|---|---------------------------------|
| ▪ Centre for Plant and Food Science | <i>Science & Technology</i> |
| ▪ Centre for Complementary Medicine (CompleMed) | <i>Health Science</i> |
| ▪ Centre for Cultural Research (CCR) | <i>Humanities</i> |
| ▪ MARCS Auditory Laboratories | <i>Social Science</i> |
| ▪ Australian Expert Group in Industry Studies (AEGIS) | <i>Social Science</i> |
| ▪ Self Concept Enhancement and Learning Facilitation (SELF) | <i>Social Science</i> |
| ▪ Social Justice and Social Change (SJSC) | <i>Social Science</i> |

In terms of the research strength of these centres against the overall research activity of the University, they demonstrate significant achievement in the generation of external research income, accounting for 40 per cent of the University's externally generated research income, while accounting for less than 13% of academic staffing. These centres do not currently, however, capture the majority of research students. This is a strategic goal for the next phase of UWS's development - to ensure that 50 per cent of our research students are linked to areas of designated research strength. URC have all demonstrated some level of excellence in international terms, through either funding, collaboration or publication activities and have a demonstrable research culture.

University Research Centres are expected to demonstrate:

- Intellectual cohesion around well articulated research problems and research programs addressing those problems.

- a critical mass of researchers including: leading, visionary and productive research leaders, a small group (e.g. 6-8) of strongly performing nationally competitive researchers, including externally funded postdoctoral fellows, a medium (e.g. 8-12) group of developing researchers as well as significant cohort of research students.
- 'succession plans', demonstrating the development of future generations of researchers via support of postdoctoral fellows and research student training.
- a substantial and clearly articulated relationship to the University's academic programs, including undergraduate, honours, postgraduate course work and research degrees
- organisational cohesion and leadership.
- collaborative research partnerships both within the Centre, within the University and with community or industry players.
- that its program has impact, as measured by its influence on other research and teaching programs.
- a 'return on investment', i.e. external income generation, benchmarked by discipline as articulated within External Panel Reviews. Such external income should have an upward trajectory and should exceed any internal funding by a very significant factor.
- quality in research publications, including but not limited to citation quantity. Have broad types of dissemination of results, appropriate to its community, industry, and scholarly linkages.

UWS's success with national competitive grants has been led by University Research Centres (URC) who accounted for 76.24 per cent of the 2005 Discovery and Linkage projects awarded to UWS. Under these schemes the ARC has awarded \$4,172,259 to URC over 5 years vindicating the University's implementation in 2002 of a focused research strategy. In three URC there has been outstanding success: the Centre for Cultural Research had a 100 per cent strike rate and was awarded five Discovery Projects, including a Professorial Fellowship and Postdoctoral Fellowship and two Linkage Projects (\$1,618,964); the MARCS Auditory Laboratories won three Discovery Projects and two Linkage Projects (\$1,283,430); the SELF research centre won a Discovery project, three Linkage projects and two Discovery Indigenous Researchers Development awards (\$805,808). Developing research strengths in the Colleges were also notably involved in this success, including the Nanotechnology and the Health Psychology Research groups.

In tandem with this strategic process of selectivity and concentration, UWS has also been developing a series of research themes (listed at Appendix A) fostering and supporting major research projects of relevance to the development of urban regions and the social welfare, health and education services so vital to Greater Western Sydney (GWS).

The theme of *Culture and Communities* had developed significantly through the work of the Centre for Cultural Research (CCR), while the *Water* theme had been strongly picked up in anticipated areas such as the Centre for Plant and Food Science but also by the Centre for Cultural Research (CCR), as well informing the University's significant involvement in the CRC for Irrigation Futures. The Water Research Program that was developed as a result of the *Research Landscape Report* (2001) nurtured a range of research intersections and generated a number of research projects as a result of intensive promotion across the University. In 2004 that program resulted in a Water Futures Alliance with Sydney Water and Sydney Catchment Authority positioning UWS as a recognised player in the national water research field.

The Research Themes are seen as a mechanism to galvanise the diverse expertise of UWS researchers. This positions UWS strongly to make a contribution to its region's strategic research needs and is showing itself to be a powerful mechanism for regional research engagement.

UWS will increasingly align its research profile with major regional concerns and issues, which in themselves are key priorities for regional governments and populations nationally and internationally. The distinctive location (geographic and socioeconomic) of UWS is one of its greatest assets and holds great potential for its research development and consolidation. The Urban and Community Development theme, led by the Deputy Vice Chancellor (Development and

International) will evolve more tangibly in 2005, both in terms of new research and teaching developments with a ‘whole of University’ focus.

The theme of Children’s Futures is being fostered through the development of a Postdoctoral program in collaboration with GWS partners and planning for a major international conference in 2006, and will have specific relevance in the developing research profile of the Medical School. UWS has allocated budget resources in the period 2005-2008 to support the development of a small number of emerging research concentrations.

3. Research and Research Training Objectives

The research landscape at UWS has an interdisciplinary focus, a collaborative orientation, and is responsive to the contemporary social, economic and environmental challenges in Greater Western Sydney and beyond.

UWS has embraced two major mechanisms for expressing research strengths: Multidisciplinary research programs that support the University Mission and have national and local relevance, and a small number of University Research Centres.

In 2004 UWS consolidated its research development goals, reflecting the clear research development trajectory outlined in the Strategic Plan 2004-2008. The key themes of the Strategic Plan are to boost the development of research generally, while reflecting the University’s distinctive strengths and orientation to practical knowledge, through research that is conducted in partnership with industries, organisations and communities in the Greater Western Sydney Region. These priorities include the development of distinctive research training.

3.1 Strategic Goals

UWS is committed to maintaining a substantial research program, to be research intensive in chosen areas of strength, to maintain and develop a substantial research training program, and to develop the next generation of research active staff, fundamentally contributing to the intellectual life and development of Greater Western Sydney. To secure its future as a research active university, UWS has set itself a series of Strategic Goals.

The Key Strategic Goals are:

| | |
|--|------------|
| <ul style="list-style-type: none"> ▪ Achieve outstanding performance in research and scholarship that is distinguished by its interdisciplinary focus and relevance to industry, government and the community | SG1 |
| <ul style="list-style-type: none"> ▪ Substantially increase UWS’s profile in research output, income, and commercialisation of findings | SG2 |
| <ul style="list-style-type: none"> ▪ Build productive research groups and University-wide research programs in areas that reflect UWS’s distinctive strengths and orientation to practical knowledge | SG3 |
| <ul style="list-style-type: none"> ▪ Develop effective research partnerships with industries, organisations and communities in the Greater Western Sydney Region, as well as nationally and internationally | SG4 |
| <ul style="list-style-type: none"> ▪ Establish distinctive research higher degree programs marked by their relevance to industry, government and community futures | SG5 |

3.2 Measuring Performance against Objectives

UWS monitors its performance in all key objectives. Income targets and productivity outputs (SG1 and SG2) are monitored annually. The role of scale and impact of our research concentrations (SG3) was significantly addressed in 2004, culminating in the second major external review of research that UWS has undertaken since 2001, culminating in the *UWS Themes in the Landscape* Report which has set the framework for the period 2004-2008, providing substantial support for a smaller number (7) of University Research Centres (URC) – see Appendix A. All centrally supported centres operate

within a secure four-year funding base (2005-2008), with the submission of an annual performance report.

The UWS Register of Research Activity (DEST Recognised Research Activity) was finalised in June 2002 following extensive review of individual applicants by the UWS Research Committee. All registrants are subject to annual review on a rolling triennium basis, ensuring that we can reflect our growth in Research Active Staff (SG2).

UWS is committed to maintaining and growing a substantial research training program and monitors its activity in this area on a regular basis – at least every semester – as well as using the annual report process, the Measures of Achievement and Confirmation of Candidature to ensure that the quality of its research training is regularly monitored and reviewed (SG5). Research Student Graduate attributes are articulated in Appendix B.

4. Ensuring a Quality Research Training Experience

4.1 Overview

UWS is determined to maintain a viable research training program, ensuring that Research Training Scheme (RTS) places stabilise and grow over time. The focus on generating growth in research income/infrastructure and on timely completions will assist UWS in this aim. One of our strategies is to increase the number of full-fee paying domestic research students. In 2001, UWS put in place the structure for a general fee-paying regime for domestic research students across all its programs. In 2004 fees were set between \$11,000 and \$13,000 full time, per annum, depending upon the discipline. In 2004, UWS sustained growth in this category of research students, achieving a load of 42.50 EFTSU in this student category across all four Colleges.

Due to the White Paper reforms and the introduction of the RTS, UWS has been forced to dramatically reduce its commencing research student operating grant load – down from 190 EFTSU in 2000 to 117 EFTSU in 2004. With this reduction in capacity has come a stronger emphasis on selecting the most highly suited and qualified applicants for research places. The University has also introduced and refined a range of quality assurance measures for the first year of candidature – see Measures of Achievement and Thesis Proposal in Section 4.8 & 4.9 below.

Since 2001 UWS has set out to improve the quality and focus of its research training effort, with particular support for selectivity and concentration in postgraduate student allocations, linking outstanding students to areas of research strength. Ultimately, this strategy will ensure a critical mass of research students connected to areas that have a strong research culture and a pattern of successful supervision, as well as the resources to ensure infrastructure needs across the disciplines. The strategic intent is the promotion of a vigorous research culture, one that values the research student's role in the innovation process and values both the tangible and intangible benefits that arise from undertaking a research degree, setting a base level of support and codifying the rights and responsibilities of both supervisors and research students.

UWS has a mission to provide research training opportunities for residents of Greater Western Sydney (GWS). In 2004, over 48 per cent of our research students are from GWS, while over 53 per cent of our research students study part time. Many of our students undertake research that relates to Greater Western Sydney, its environment and people. These factors provide both a stimulus and challenge to our research training programs.

4.2 Access to resources

UWS has sought to implement a systematic baseline of funding support for all research student candidates, increasing our attractiveness to prospective students and ensuring timely completion is not hindered by any resource deficits.

UWS maintains a minimum standard for research student support, including physical space and equipment; support for conference travel for presentation of research; library resources and privileges; and access to laboratories for research purposes. The Dean of Research Studies is responsible for monitoring and recommending action on these key issues, in particular ensuring that

dedicated research student accommodation is available on all campuses. At the project level, UWS provides candidature support for all research students, setting standards for college contributions to individual candidature support as well as providing access to conference support for students presenting work at national or international conference (\$2,000 and potentially twice during candidature). Over 33 per cent of the RTS funding the University receives is used to fund competitive stipend scholarships. In 2004, 34 per cent of UWS research students were provided living support via a stipend scholarship.

UWS is aware that it needs to provide a research scholarship program for outstanding students that can compete with the stipend support offered by research-intensive universities, particularly the University of New South Wales and the University of Sydney who actively compete for our best students. UWS is keen to continue to gain APA (I) scholarships through the Linkage programs, as well as through its success in pursuing project funding and scholarship support provided by the rural research agencies. UWS instituted top-up scholarship funding for outstanding APA applicants in 2001, in an attempt to remain competitive in an increasingly challenging environment. UWS also introduced a Completion Scholarships Program in late 2001. These are six month stipend scholarships given to outstanding students who will submit their thesis at the end of the six month period of support and have received no other stipend support throughout their candidature. Three rounds of this program have now been conducted and several theses have been submitted.

4.3 Supervisory Load and Panels

UWS is committed to the development of effective supervisory teams - panels of two and three staff jointly supervising research students. Each principal supervisor must be an employee of UWS or hold an honorary or adjunct appointment. UWS also encourages the appointment of associate supervisors from industry as well as other universities. The supervisory panel is seen as an excellent way of mentoring newer staff through the supervisory experience as well as providing students with rounded expertise in topic areas that are increasingly interdisciplinary.

Given the managed decline its HDR load over the period 2001-2004, UWS has also instituted a policy that will normally restrict principal supervisors to a maximum load of 3.0 EFTSU in any one year. This is designed to ensure supervisors can focus on the quality of their supervision, as well as allowing for the strengthening of supervisory panels and the mentoring/ development of less experienced staff, thus contributing to growth in the number of Research Active Staff. The UWS Research Studies Committee monitors supervisory load on an annual basis.

4.4 Supervisor development and quality assurance

As part of its mission to achieve excellence in teaching and research, the University needs to recognise and encourage high quality postgraduate research supervision by academic staff. Research supervision is a subtle and complex form of teaching. The quality of higher degree graduates is related to the quality of supervision provided. UWS has undertaken two broad measures to assist in the development of supervisor skills and expertise. These are the establishment of the UWS Register of Graduate Supervisors and the implementation of ongoing Supervisor Training programs. Supervisors for research degree candidates must be admitted to the Supervisor Register before being eligible to supervise a research higher degree candidate. All supervisors are required to register and to attend training sessions. Under the Register of Research Active Staff, all principal supervisors must also be registered as Research Active Staff. Supervisors are also advised that a pattern of unsatisfactory supervision will ultimately lead to removal from the Supervisor Register. During 2004, nine supervisor workshops/forums were held with a total of 202 attendees. The Vice-Chancellor awards an annual prize for research higher degree supervision.

4.5 Student Grievances

UWS has a formal grievance policy for students who may have a dispute relating to supervision, progress, resources or other academic issues. Students are encouraged to use informal structures initially, as the matter may be resolved easily. The formal Grievance policy uses the principle of "one-step-removed" with the problem being investigated outside the College of enrolment by the

UWS Dean of Research Studies and reporting to the PVC (Research). Strict timelines and procedures have been approved for conducting a formal grievance. If students are dissatisfied with the outcome of a formal grievance, they may appeal to the PVC (Research).

4.6 Student Development

UWS continues to support the development of an integrated suite of development offerings available to research students across UWS. Research Services, in conjunction with the Educational Development Centre and other units from the Division of Academic and Services, provided a range of workshops during 2004. These workshops are intended to complement workshops for Research Students organised through the Colleges and Schools.

In 2004, 30 research student workshops were held, involving 390 attendees. Feedback from research students concerning these complementary development programs has been positive. The effective and intense collaboration between Educational Development and Research Services ensures the development and maintenance of such programs.

The School of Applied Social and Human Sciences, College of Social and Health Sciences, has developed an integrated program of Research Methods for the Humanities and Social Sciences, a program that consists of a pool of approximately 30 self-contained modules each addressing one aspect of research methods in the humanities and social sciences. Each semester, some are offered in intensive mode. Those offered in distance mode can be done at any time.

4.8 Measures of Achievement – Student Progress

In 2001, UWS introduced a policy that applied to all first year research higher degree students. The objective of the policy is to develop for each student a set of Measures of Achievement against which progress can be evaluated at the end of six months and at the end of the first year. This is part of the University's implementation of a quality assurance framework for its research training programs and is designed to improve the quality of reporting, provide appropriate assessment of progress, and a procedure to standardise the monitoring of progress across diverse colleges and disciplines.

The Measures of Achievement are drawn up by negotiation at a meeting between the supervisory panel and the student within the first month of candidature. The Measures of Achievement are unique to each student and are attached to the student's file as a permanent record. A copy of the Measures of Achievement is sent to the student with the first progress report form at the end of six months of candidature. Both student and supervisory panel complete the progress report.

4.9 Confirmation of Candidature

The culmination of the Measures of Achievement process is the Confirmation of Candidature. At the end of 12 months, or before, a proposal is prepared by the candidate and submitted to the supervisory panel. Generally, this consists of a 15-20 page proposal (5,000 words), which outlines the theoretical framework, research questions, research design, methods of analysis, etc.

This Proposal goes to the College Research Committee for recommendation, following presentation and defence by the candidate. The entire structure of the first year review is designed to lead to an important milestone for both student and supervisor. It allows all parties to ask whether there is genuine progress by the student and, equally, whether supervision has been adequate. Within this framework, early termination becomes an option. Ultimately, the seriousness of both studying and supervising becomes codified and examinable in a fair and transparent manner, providing a quality assurance framework that will hopefully lead to research students experiencing a fulfilling candidature and within the time limits of RTS funding.

4.10 Research Completions

In the period 2001-2004, significant focus and energy was applied to increasing research completions rates. In 1998, UWS had the second lowest completion to load ratio in the sector. By 2003, UWS had a completions-to-load ratio that equalled or bettered the sector average. This improvement in performance has been achieved through a more structured first year program and a greater emphasis on the quality of candidates, allowing UWS to retain and grow an effective research training

program. Within candidature, there is an expectation that full-time Masters Honours students will complete in 18 months, and full-time PhD candidates in 3 years. This is not to deny any student a full RTS place at either 2 or 4 years full-time equivalent, if needed, but UWS has sought to instill within students and supervisors expectations about the seriousness and currency of their research training endeavours. UWS provides substantial funding for research students to present work in progress at national and international conferences and develop a refereed publication from this activity (up to \$2,000 per conference). Research students are encouraged to achieve at least one refereed publication during their candidature (articulated in the HDR Graduate Attributes – see Appendix B).

UWS has also commenced a more systematic review of examination data, particularly regarding the examination outcomes. The number of students receiving Option A (straight award of the degree) increased from 7 in 2003 to 18 in 2004, while the number of examined theses requiring minor amendments (Option M) rose from 55 in 2003 to 60 in 2004. The number of students requiring significant rewriting (Option R) fell from 32 in 2003 to 18 in 2004, while the number of thesis examinations requiring re-examination (Option X) fell from 6 in 2003 to 4 in 2004. No research students failed the examination process in 2003 or 2004.

4.10 Recent Achievements

Some recent achievements in research training at UWS, include:

- Continued growth in domestic research fee paying programs and some growth in RTS places
- Continuing success with ARC Linkage Australian Postgraduate Awards (Industry)
- Completion to load ratio now equals sector performance
- 185 students authoring DEST recognised publications in 2004 – up from 113 in 2003, in line with the expectations articulated in the Graduate Student Attributes.

5. Collaboration and Partnerships

5.1 Research Partnerships

The University has developed strong links with both government and industry sectors, especially within its region, and these are central to the achievement of its research mission. Industry partnerships are leveraged through effective liaison and brokerage between UWS Research Services and the Office of Business Development. UWS has developed a program of internal funding, the UWS Partnerships Scheme, which provides seed finance for the establishment of links leading to long term associations with external partners – up to \$35,000 matching funding per project. These linkages provide greater opportunities for funding research and research training and for access to infrastructure.³ UWS continues to win ARC Linkage project funding for a variety of projects in collaboration with public and private sector agencies.

In 2004 UWS secured 12 new ARC Linkage grants. UWS success in the two rounds per annum ARC Linkage Scheme continues to be above the sector average and shows an increasing quantum and contribution from industry partners. UWS accounted for 2.10 per cent of 2004 ARC Linkage applications and 2.26 per cent of successful 2004 ARC Linkage grants.

In late 2004 UWS achieved notable success with the ARC Discovery scheme. UWS performance has been steady with an increasing number of quality applications being submitted. For the first time UWS equalled or bettered the national success rate (30.8%) in this prestigious national grant scheme and received its highest ever number of new awards - fifteen. Many of these successful projects involve national and international collaboration.

³ A 2004 review of the scheme found that in the period 2001-2003, researchers awarded Partnership Grants had made 22 ARC Linkage applications and had been awarded 12 ARC Linkage grants. In the same period, the program also generated over \$500K of external research income.

Regional

In 2004 UWS research teams focussed their energies on a range of regional collaborations exploring key economic, social and cultural issues. UWS aims to be at the heart of its region's development, particularly as a catalyst for innovation and a contributor to the region's well-being, social capital, and economic vitality,

Increasingly, scholars and researchers from different fields find themselves working together on projects where their academic interests converge. In 2004 a UWS research team involving the disciplines of management and nursing, led by Associate Professor Margaret Vickers, began work on an ARC Linkage project with the Wentworth Area Health Service examining the extent, nature and sequelae of bullying in the Australian nursing context. It is hoped that the research results will provide a framework for policy makers and health professional to explore proactive approaches to bullying and provide a validated tool that can be used to explore bullying in other workplace settings.

A further example of interdisciplinary work linked to regional initiatives is the collaborative work of the Nanotechnology research group with GWS industry partners. One such collaboration, examining the potential economic and environment impact of nanotechnology innovation on gravure printing, has been consolidated over time through a UWS Partnership grant, contract research and in 2004 the award of a major ARC Linkage grant involving funding for a postdoctoral research fellow.

In the health portfolio, UWS has maintained several long term collaborations with Area Health Services covering the sponsorship of research positions at the University, notably jointly funded research Chairs and the establishment of specialist nursing research units. These include, for example, the Rehabilitation Nursing Research and Development Unit at Parramatta, and the Centre for Applied Nursing Research at Liverpool Hospital. The research work of these units links into the national Research Priority of *Promoting and Maintaining Good Health*.

The University continues to expand the UWS Cooperative Programs, an integrated suite of programs that links students with employment and research opportunities within the region, building a particular bridge to Small to Medium Enterprises (SME) through the research undertaken. In 2002, the UWS Cooperative Programs was included in a Compendium of Good Practice University–Regional Development Engagement Initiatives released by the Commonwealth Department of Transport and Regional Services.

http://www.uws.edu.au/about/adminorg/devint/ord/students/cooperative_programs

UWS has a strong record in securing both State and Local Government research funding. In 2004, UWS received over \$1.9 million in external research income from State Government sources while total Other Public Sector funding, including Local Government and Other Commonwealth, was just under \$3.6 million. UWS research activity has a range of significant intersections with local government – over \$300,000 was generated in external research income from this sector during 2004. UWS is generally in the top ten universities across the sector in generating research funds from local government sources.

National

UWS researchers are increasingly involved in collaborative research, both nationally and internationally, with government agencies, universities and private companies. Overwhelmingly such partnership building is linked to UWS research strengths.

In 2004 a UWS led consortium secured major five year funding under the ARC Networks program. MARCS Auditory Laboratories and researchers at Macquarie University formed the ARC Network in Human Communication Science to carry out interdisciplinary research in speech, language and sound, by and between humans and machines. Chaired by Professor Denis Burnham, Director of MARCS, the Network was awarded \$2 million in seed funding. The Network includes the University of Sydney; University of Queensland; University of Melbourne; RMIT University; Australian National University; University of New England; Queensland University of Technology; University of Western Australia; University of Canberra; the University of New South Wales; and

CSIRO - Mathematical & Information Sciences; Australian Speech Science and Technology Association; and the Australian Music and Psychology Society; the Defence Science and Technology Organisation, the Bionic Ear Institute, and Cochlear along with major universities and research institutes in Japan, the UK, the US, Asia, and Europe.

UWS's collaboration across the sector continues with Professor Bill Price's NSW Government BioFirst Award helping UWS secure the award of ARC Linkage Infrastructure funding of \$740,000 for laboratory and start up costs for an Ultra-High Resolution NMR Imaging System for Nanotechnology including Nanobiotechnology to be located on the Campbelltown campus. Within this and other developments, UWS has achieved recognition for its emerging strength in Nanotechnology, being a partner in the ARC Centre of Excellence in Functional Nanotechnology research. This development links into the National Research Priority of *Frontier Technology for Building and Transforming Australian Industries*.

In 2004, at Parliament House, the Minister of Education, Dr Brendan Nelson, launched *The Attraction of Strangers*, an important report about humanities partnerships with industry, by Professor Ien Ang and Dr Elizabeth Cassity of the Centre for Cultural Research (CCR) in collaboration with the Australian Academy of the Humanities. CCR addresses the challenge of doing relevant and practical research in a culture that is increasingly globalised, postmodern, heterogeneous and technologically mediated. By 'creating knowledge with' rather than 'doing research on' communities, the Centre is producing new types of knowledge accessible to a broad range of audiences and community stakeholders. In late 2004 Professor Ang was awarded a prestigious ARC Professorial Fellowship and five year ARC Discovery funding for her project *Cultural Research for the 21st Century: Building Cultural Intelligence for a Complex World*.

UWS is an active participant in the CRC for Irrigation Futures, leading research on urban and peri-urban irrigation as well as supporting several CRC funded research students. Such environmental research links into national research priorities, particularly *An Environmentally Sustainable Australia*, while also forging links between environmental science and social and cultural research.

International

UWS has continued to increase its connectivity with international research agencies access to international funding sources.

In 2004 the Australia Expert Group in Industries Studies (AEGIS) at UWS further internationalised its research effort, receiving major funding under the ASEAN - Australia Development Cooperation Program (AADCP) - Program Stream for a major multi-site project designed to enhance regional skills recognition arrangements (SRA) in ASEAN member countries. The research team, led by Professor Tim Turpin is undertaking a cooperative program of research and analysis relating to Skills Recognition Arrangements (SRA) which will enable ASEAN member countries to keep their own SRA systems under review in order to meet emerging industry and employment needs and promote regional labour flexibility.

UWS has close links with several Asian and Pacific countries in the realm of rural and environmental research, and the Centre for Plant and Food Science has expanded its work on Integrated Pest Management, particularly in Vietnam and PNG. UWS is also a key player - through ACIAR funding - in the development of inland aquaculture in PNG, working with government agencies to improve the productivity and profitability of smallholder fish farmers. The long term outcome of this research will be increased dietary protein and better nutrition for farmers, their families and inland communities.

In 2004, in collaboration with Melbourne University, UWS secured funding to support its involvement in a collaborative project under the Fifth Framework European Union Program to examine manufacturing processes in small and medium sized enterprises with the aim of developing diagnostic software to reengineer those processes.

Internally, UWS supports its expansion of international research activity through the International Research Initiatives Scheme, which makes use of some of the 11 per cent of the IGS funding that the University reserves for strategic activity, to promote: (a) an active international staff exchange and visitor program that supports international visitors for both short and long-term visits and sends our own staff overseas. Staff are encouraged to visit other universities, supported by internal sabbatical and conference participation programs, supplemented by applications to external programs.

5.1 National Research Priorities

Given the collaborative problem solving nature of much of UWS's research effort, the University is able to respond in a dynamic way to several of the national research priorities. At the upper level of the national priorities, UWS responds significantly to

- An environmentally sustainable Australia
- Promoting and maintaining good health
- Frontier technologies for building and transforming Australian industries.

In 2004, 81% of ARC Linkage applications submitted by UWS for funding in 2005 related to at least one of the national research priorities – likewise, 60% of ARC Discovery applications submitted by UWS related to a least one of the national research priorities. Within priorities, UWS responds significantly to 2.1 *A healthy start to life*; 2.1 *Ageing well, ageing productively*; 3.2 *Frontier technologies*; and 3.5 *Promoting an innovation culture and economy*.

6. IP, Commercialisation and Contractual Arrangements

6.1 Commercial Activity and Intellectual property

Research contracts and Intellectual Property (IP) related to research are managed collaboratively through the Office of Research Services (ORS) and the Office of Business Development (OBD), both operating within the Division of Development & International. Consultancies, other than contract research, and all commercialisation activity are handled through OBD. Pro-active participation in research outcomes begins with the administrative review of all research proposals to ensure appropriate costing and overhead recovery. Research contracts are predominantly undertaken at marginal cost recovery, plus overheads, in return for which the University retains whole or joint ownership of any intellectual property. All research contracts are negotiated to protect University investment and preserve its interests in any project-generated commercialisable outcomes. The strong relationship between OBD and ORS ensures that the identification and assessment of new IP is effectively undertaken. The Research Development Team within ORS plays a particular role in the early stages of project development, ensuring that University IP interests are protected and effectively negotiated and alerts OBD to commercialisation opportunities. The UWS Office of Legal Counsel provides legal advice to both ORS and OBD on research and commercialisation matters.

Commercialisation activities, including licensing of IP and the creation of spin-outs with IP assigned, are managed through the Office of Business Development in accordance with the UWS Intellectual Property Policy. When academics and staff from OBD identify potentially valuable IP, external negotiations are undertaken jointly with the academic and OBD staff concerned. OBD has developed an Invention Information Form which is available on-line for quick and effective lodgement of new inventions <http://www.uws.edu.au/about/adminorg/devint/obd/ccr/patents> as well as an informative commercialisation flow chart. Confidentiality Agreements protect UWS interests. External Commercial and Intellectual Property lawyers support the University's contract negotiations and well as undertaking directed IP audits. UWS also has access to internal Legal Counsel through the Division of Corporate Services. OBD has established an Institutional IP database, with particular emphasis on commercialisation agreements.

The Office of Business Development works directly with researchers to provide complementary business skills for consulting and commercialisation activity. In addition, specific expertise is brought in when required from the market place to assist in commercialisation opportunities. For a specific item of intellectual property that may have commercial value, the University will engage

expert consultants to undertake market research so that opportunities are clearly identified and strategies developed.

The Office of Business Development has also undertaken a major audit of the University's IP portfolio as well as the development of guidelines for commercial activity as required under NSW legislation.

Policy Framework

The UWS Intellectual Property Policy sets the framework for the commercialisation of research activity - <http://sites.uws.edu.au/uws/policies/ppm/doc/000085.html> This 2001 policy reflected compliance with the NSW Auditor's recommendations regarding best practice and is consistent with the ARC's *National Principles of Intellectual Property Management for Publicly Funded Research*. This policy has been promoted widely to UWS academic and student communities through the Web as well as through the regular staff development programs on Intellectual Property that the Office of Business Development holds. The Office of Business Development is undertaking a major review of the policy in 2005 to ensure its principles and practice support the University in its efforts to foster relationships with industry, reward innovators for their creative efforts, and reflect current changes to Intellectual Property law and IP management. The review will also respond to the recommendations of the Public Accounts Committee of the NSW Legislative Assembly.

The University has a staff Code of Conduct that is issued to and signed by all staff on appointment. Staff members are also taken through key aspects of the Code of Conduct during their induction process. The Code of Conduct deals specifically with the requirement to avoid any situation where a conflict of interest arises between the staff member and their role as an employee of the University.

Ownership of IP

The University owns intellectual property developed through research conducted in the normal course of a staff member's work. The University is committed to sharing the rewards that may arise from the commercialisation of any University owned intellectual property with its creators. The distribution of profits between the creators and the University will, as a minimum, ensure that creators receive a 30 per cent distribution of net profits from the commercialisation after deducting costs. The University will also assign IP ownership to the inventors where the University determines that it will not pursue a commercialisation pathway.

Research students, not being employees of the University, own the intellectual property that they generate. Where a student's supervisor makes a contribution to the intellectual property, the intellectual property will be owned jointly by the student (who is not an employee) and the University (as the supervisor's employer). Where students participate in research projects that are funded by industry collaborators and/or have commercialisation horizons or objectives, there is a formal agreement between the University and any industry collaborator and students are asked to assign their interest to the University in the intellectual property that they create. The terms of the assignment usually provides that the student will share in net commercialisation revenues.

Workshops are regularly held with research students to explain the requirements of the University's IP Policy specifically focussing upon: Disclosure; Ownership; Commercialisation; Application to research projects.

6.2 Commercialisation Strategies

The Office of Business Development supports the University's commercialisation strategies through a business case methodology that addresses all proposals with respect to the overall benefit to the University; financial and cost flow analysis; proposed funding arrangements; compliance with competitive neutrality; due diligence requirement; IP ownership and protection; insurance requirements; and market analysis.

The business case model also includes the adoption of an appropriate structure and the establishment of Corporate Governance procedures. In considering the share of reward the University considers:

the size of the proposal; the time frame required in implementing the business model; the risks involved and who bears the risk; the market opportunities for the proposal; the resources required to be committed by the University and/or investors/investors; the ability of the University to control the IP.

The Business Case for a spin-out proposal also includes the investment framework and the identification of potential investors. The University's IP policy provides for the distribution of net profits to inventors. This may include the taking up of equity in start-up companies by inventors.

UWS employs a variety of strategies to engage potential investors and industry partners, with a particular focus on and industry networking, particularly regional business networks including on-campus events for potential partners hosted by the Office of Regional Development and OBD. UWS is connected to one of the Commonwealth Government's Pre-Seed Fund managers. The SciVentures Pre-Seed Fund has a total capital of \$33 million of which the Commonwealth has provided \$20.3 million. The Fund invests in a range of technologies from universities and public sector research organisations.

With regards to commercialisation, UWS has always sought to look at best practice in other institutions. UWS is an active member of sectoral commercialisation forums, including: Knowledge Commercialisation Australasia; Association of University Technology Managers; and Association of European Science and Technology Transfer Professionals.

Incentives for Commercialisation Activity:

The University's intellectual property policy provides a minimum distribution of net profits to the inventors (30 per cent). This amount will vary on a case-by-case basis and to date amounts up to 50 per cent have been negotiated. The University also provides for equity participation of staff in spin-out companies. The University to date has only had two spin-out companies where equity participation has occurred. Each case was individually negotiated based upon the circumstances of the proposal.

For academic staff, the University provides within its promotion processes provision for assessment and recognition of research commercialisation activity, including the awarding of industry research grants, commercial consulting and commercialisation initiatives.

The University also directly funds its Research Centres to support the commercialisation of research outcomes. This includes the resourcing of the staff necessary to support commercialisation activities as well as seed funding which allows for new research projects to be undertaken.

UWS policy allows members of staff to hold executive positions and directorships with a spin-out company, though such appointments require the approval of both the University Board of Trustees and the Vice Chancellor.

6.3 Recent Achievements

UWS has begun to coordinate the commercialisation of several promising products. In late 2004 negotiations with a major French consortium reached fruition regarding the commercialisation of Intellectual Property nurtured by a UWS research team led by researchers from the Centre for Advanced Food Research and partners Dairy Australia, CSIRO Food Science Australia, and Dairy Farmers. The team collaborated in the development of an import replacement and internationally marketable product from dairy processing. In 2003 this research was awarded the Environmental Science Technology Sector Award for Excellence as part of the national *Knowledge Commercialisation Australasia (KCA)* awards. The integrity and efficacy of this new knowledge has guaranteed its uptake within the European Union under the ongoing commercialisation activity [see *Whey in front*, Business Review Weekly, 16.06.05, p. 50].

In March 2005, the University in collaboration with the University of Sydney and the new medical biotechnology company, Medical Therapies Pty Ltd, launched an exciting new venture in commercialising university IP, based on years of ground-breaking research into better anti-cancer and anti-inflammatory drugs, through the establishing of a new company that will be listed on the

Australian Stock Exchange -

http://apps.uws.edu.au/media/news/index.phtml?act=view&story_id=1183

This commercialisation model allows for the significant sharing of commercialisation expertise and activity across universities and between the public and private sectors.

TABLE 1: Higher degree research (HDR) students (by EFTSL) in 2004

| | All HDR students₁ (EFTSL) | HDR students commencing in 2004 (EFTSL) |
|---|---|--|
| All research - by research cluster₂ | | |
| Science & technology | 164.00 | 35.00 |
| Health & medical research | 44.00 | 6.50 |
| Arts, humanities & social sciences | 368.60 | 75.50 |
| Total - All research | 576.60 | 117.00 |
| Areas of research strength₃ | | |
| Science & technology | | |
| <i>Plant & Food Sciences</i> | 31.50 | 3.50 |
| Health & medical research | | |
| Complementary Medicine (CM) | 18.50 | 3.00 |
| Arts, humanities & social sciences | | |
| <i>Auditory Research (MARCS)</i> | 18.0 | 9.00 |
| <i>Cultural Research (CCR)</i> | 29.00 | 3.50 |
| <i>Industry Studies (AEGIS)</i> | 7.50 | 3.50 |
| <i>SELF Concept (SELF)</i> | 15.50 | 3.00 |
| <i>Social Justice Social Change (SJSC)</i> | 9.00 | 2.50 |
| Total - Areas of research strength | 79.00 | 21.50 |

NOTES ON DATA PROVIDED IN TABLE 1

TABLE 2: Research income in 2004

| | Category 1 (\$'000) | Category 2 (\$'000) | Category 3 (\$'000) | Category 4 2003-2004 (\$'000) |
|---|--------------------------------|--------------------------------|--------------------------------|--|
| All research – by research cluster₂ | | | | |
| Science & technology | 2,790,432 | 942,179 | 993,727 | 5,207 |
| Health & medical research | 71,021 | 666,177 | 326,433 | |
| Arts, humanities & social sciences | 1,573,346 | 1,649,551 | 816,778 | |
| Total - All research | 4,434,799 | 3,257,907 | 2,136,939 | 5,207 |
| Areas of research strength₇ | | | | |
| Science & technology | | | | |
| <i>Plant & Food Science</i> | 1,235,628 | 141,927 | 254,619 | |
| Health & medical research | | | | |
| Complementary Medicine (CM) | 11,391 | 125,650 | 132,161 | |
| Arts, humanities & social sciences | | | | |
| <i>Auditory Research (MARCS)</i> | 319,203 | 31,378 | 55,452 | |
| <i>Cultural Research (CCR)</i> | 256,556 | 73,897 | 62,902 | |
| <i>Industry Studies (AEGIS)</i> | 80,035 | 415,125 | 117,311 | |
| <i>SELF Concept (SELF)</i> | 291,025 | | 45000 | |
| <i>Social Justice Social Change (SJSC)</i> | 48,684 | 215,847 | 15,049 | |
| Total - Areas of research strength | 2,242,522 | 1,003,824 | 682,494 | |

NOTES ON DATA PROVIDED IN TABLE 2

TABLE 3: Research active staff in 2004

| | Number of research active staff ¹ | Number of staff who generated research income ² | Number of staff who generated publications ³ | Number of staff eligible to supervise HDR students ⁴ | Number of staff supervising HDR students ⁵ |
|---|--|--|---|---|---|
| All research – by research cluster⁶ | | | | | |
| Science and technology | 76 | 55 | 144 | 106 | 65 |
| Health & medical research | 20 | 20 | 39 | 45 | 19 |
| Arts, humanities & social sciences | 166 | 70 | 355 | 305 | 164 |
| Total - All research | 262 | 145 | 538 | 456 | 248 |
| Areas of research strength⁷ | | | | | |
| Science & technology | | | | | |
| <i>Plant & Food Sciences</i> | 16 | 15 | 29 | 19 | 16 |
| Health & medical research | | | | | |
| Complementary Medicine (CM) | 6 | 2 | 4 | 9 | 8 |
| Arts, humanities & social sciences | | | | | |
| <i>Auditory Research (MARCS)</i> | 7 | 5 | 13 | 10 | 8 |
| <i>Cultural Research (CCR)</i> | 14 | 7 | 16 | 11 | 10 |
| <i>Industry Studies (AEGIS)</i> | 5 | 5 | 12 | 3 | 2 |
| <i>SELF Concept (SELF)</i> | 8 | 4 | 20 | 8 | 6 |
| <i>Social Justice Social Change (SJSC)</i> | 4 | 5 | 21 | 7 | 5 |
| Total - Areas of research strength | 60 | 43 | 115 | 67 | 55 |

NOTES ON DATA PROVIDED IN TABLE 3

1. See UWS Register of Research Activity

http://www.uws.edu.au/about/adminorg/devint/ors/activitystrengths/research_active_register

Research active staff numbers include all those staff whose status on the UWS Register of DEST Recognised Research Activity is either QUALIFIES or PROVISIONAL and covers the triennium 2001-2003. Those with an OPEN registration (368) – recording activity but not meeting the threshold on 2 of the 3 measures – are not included in the above figures

2. First Named Investigator only

3. 2004 HERDC publications data

4. Registered on the UWS Graduate Supervisors Register

5. As Principal Supervisor only

TABLE 4: Qualifications and activity of staff who supervised HDR students in 2004

| | Number of supervisors holding a higher degree qualification¹ | Number of supervisors who undertook formal supervisor training in 2004² | Number of staff who have supervised at least one HDR student to completion in 2004³ |
|---|--|---|---|
| All research – by research cluster⁴ | | | |
| Science and technology | 64 | 40 | 32 |
| Health & medical research | 19 | 33 | 6 |
| Arts, humanities & social sciences | 163 | 129 | 52 |
| Total - All research | 246 | 202 | 100 |
| Areas of research strengths⁵ | | | |
| Science & technology | | | |
| <i>Plant & Food Sciences</i> | 16 | 8 | 10 |
| Health & medical research | | | |
| Complementary Medicine (CM) | 8 | 7 | 1 |
| Arts, humanities & social sciences | | | |
| <i>Auditory Research (MARCS)</i> | 8 | 7 | 3 |
| <i>Cultural Research (CCR)</i> | 10 | 8 | 5 |
| <i>Industry Studies (AEGIS)</i> | 2 | 0 | 1 |
| <i>SELF Concept (SELF)</i> | 6 | 4 | 3 |
| <i>Social Justice Social Change (SJSC)</i> | 5 | 5 | 4 |
| Total – Areas of research strength | 55 | 39 | 27 |

NOTES ON DATA PROVIDED IN TABLE 4

1. as Principal Supervisor
2. as Principal Supervisor

Vice-Chancellor's Certification Statement

I, **Professor Janice Reid**

being the Vice-Chancellor/President of

the **University of Western Sydney**.....

hereby certify that the information in these documents has been compiled in accordance with the guidelines for the 2005 Research and Research Training Management Reports issued by the Department of Education, Science and Training, and that the information contained therein is correct.

Signed:

Title: Vice Chancellor.....

Date:

APPENDIX A

UWS Research Concentrations 2005

1. University Research Centres – URC (7)




University Research Centres

- **Centre for Cultural Research** – innovative applied cultural studies: cultural diversity and community relations; Urban cultures and public space; Art, culture and heritage; Cultural dimensions of media and technology ; transnational connections.
- **MARCS Auditory Laboratories** – cognitive psychology: auditory processes, speech technology, language development and cognition, musicality, gesture and emotion, hearing and hearing impairment)
- **Social Justice and Social Change Research Centre** -sociology: human rights and social capital; urban social conditions; population health; life course (especially childhood).
- **Self-Enhancement Learning and Facilitation Research (SELF) Centre** - educational psychology: Self-concept; Indigenous education; motivation; developmental of young children; Self-concept and effective schooling
- **Centre for Horticulture and Plant Sciences** plant science, soil and environment, sustainable and safe plant production systems, food quality and protection.
- **Centre for Complementary Medicine Research** - Health science: Traditional Chinese Medicine, naturopathy, Herbal Medicine, Quality Assurance of Complementary Medicine through laboratory research, Public health and policy research, clinical trials.
- **Australian Expert Group in Industry Studies (AEGIS)** - Social and economic sciences: Industrial dynamics, Innovation, Knowledge systems, Science and technology policy, Regional development

Office of Research Services, July 2005

2. Research Programs (4)

- Water Research (2002)
- Culture and Community (2002)
- Urban and Community Development (2002)
- Children's Futures (2005)

APPENDIX B

UWS Higher Degree Research (HDR) Graduate Attributes

UWS Research Graduates will be equipped with skills and knowledge that will enable them to:

- develop their capabilities to the highest potential throughout their lives (for personal growth and fulfilment, for effective participation in the workforce and for constructive contributions to society);
- advance knowledge and understanding to the benefit of society;
- aid the application of knowledge and understanding to the benefit of the economy and the society;
- adapt and learn, consistent with the needs of an adaptable knowledge based economy at local, regional and national levels.
- contribute to a democratic civilised society and promote the tolerance and debate which underpins it;
- contribute to Australia maintaining and developing its research competence and international credibility across a wide range of fields of knowledge;
- have an embedded ability to communicate with and present to a wide variety of people, by written, other visual and verbal means;
- engage in effective work practices and demonstrate collaborative skills.

PhD graduates will have:

- capacity to conduct research independently at a high level of originality and quality;
- capacity to independently conceive, design and carry to completion a research program or project;
- uncover new knowledge either by the discovery of new facts, the formulation of theories, the development of new interpretive arguments/framework, innovative critical analysis, and/or the innovative reinterpretation of known data and established ideas;
- demonstrated an independence of thought and approach, a deep knowledge of the field of study and to have made a substantive original contribution to knowledge.

Professional Doctorate graduates will have:

- capacity to conduct research independently at a high level of originality and quality;
- demonstrated an independence of thought and approach, a deep knowledge of the field of study evidenced by advanced scholarship, including a critical understanding of literature, theories, methodologies and/or debates;
- contribute to the advancement of knowledge and made a substantive original contribution to their professional practice, enhancing the role of research in professional practice.

Research Masters graduate will have:

- training in research methodology and techniques in their critical evaluation, appropriate to their field of study;
- skills in the application of such methodology by conducting a specified program of research under appropriate supervision;
- a thorough understanding of the relevant techniques in the field demonstrated both by their application and comprehensive review of the literature.

It is expected that all Research Higher Degree students will achieve authorship on at least one peer reviewed publication during their candidature.