Macquarie University

External Research-Based Engagement and Knowledge Transfer Audit
Undertaken in 2008

Final Report

November 2009
Introduction

The Macquarie University External Engagement and Knowledge Transfer Audit was designed to collect information relating to the social, environmental, cultural, economic and/or commercial impact that the University’s research has had over the previous five years, both within Australia and internationally. To this end the Audit aimed to establish the level of engagement that Macquarie researchers have had over the period 2003 to 2007, with external organisations or communities that might have an interest in, or gain benefit from, the results of our research. It also aimed to explore the influence that these research results have had on the businesses, or other interests, of those organisations/communities. It is important to distinguish the results of this Audit from impact within the academic community, which is seen rather as a component of research quality/excellence and which might be measured by citations, or peer-review, or similar indications of research quality.

The University’s main driver for the Audit was Goal 4 of the 2006 - 2008 Research Strategic Plan, which stated that the University aimed: “to be a significant contributor to the nation's economic, social and cultural well-being”. If we were to measure this indicator regularly, we needed benchmark data.

In promoting the Audit to staff participants, the reasons for the audit were stated to be:

- The data collected and its analysis would be an important component of the 2009 AUQA exercise – this indeed turned out to be the case, the University received a Commendation for undertaking the Audit;

- The Audit would be beneficial for the University's preparation for the Commonwealth Government’s Excellence in Research for Australia (ERA) and “Compacts” programs – as things transpired, “Impacts” was dropped from the ERA Trial undertaken in mid 2009. Whether Impacts will be included in the main ERA exercise in 2010 remains to be seen;

- A register of engagement/knowledge transfer activities would be beneficial in promoting (in conjunction with External Relations) the University’s research, both in the media and in the community (at the local, State and National levels) – this concept of a register did not eventuate, however results of the Audit were transmitted to Faculties, and the higher rated engagements communicated to the section of the DVCRO dealing with partnerships (Business Development Managers); and

- The Audit had intrinsic merit in raising the consciousness of staff members involved in research to the concepts of Impact and engagement and the associated value placed upon them by the University (and the Government).

Definitions used in the Audit

“Research-Based Engagement and Knowledge Transfer’. A suitable definition of “research-based engagement” is:

Activities between the University and research end-users which are of mutual benefit (or at least potential benefit) and involve the transfer, sharing or interchange of knowledge derived from research.

An accepted definition of “research-based knowledge transfer” is:

The process of engaging, for mutual benefit, with business, government or the community to generate, acquire, apply and make accessible the knowledge,
derived from research, that is needed to enhance material, human, social and environmental wellbeing, and the success of commercial enterprises.

Research-based engagement and knowledge transfer is therefore a process by which the results of research are communicated to an end-user organisation/community and which have the potential to benefit the end-user. This goes beyond simply the creation of new knowledge. The benefit can be under one or several of the headings social, environmental, cultural, economic and commercial.

“Research End-user”. An “end-user” of research can be defined as a company, external agency, organisation or community which benefits directly or indirectly from the outputs of that research. For the purposes of the Audit, a suitable definition of an end-user of a particular piece of research is “the external non-academic entity which benefits from the uptake of the outputs of that research”.

Audit Process

Part 1 – Pilot Study

Planning for the Audit commenced in February 2008. We hoped to utilise experience of others in the Audit, but it was apparent that institutional surveying of Impact was a novelty – an internet search could not find a report from any research institution attempting such a survey. Certainly, Macquarie appeared to be the first university in Australia seeking to undertake a comprehensive audit of its research engagement and knowledge transfer. We therefore had to design the Audit from scratch.

To do this we believed that it would be a good idea to undertake a pilot study with two Divisions, one science and one non-science. The Division of Information and Communication Sciences and the Australian Centre for Educational Studies were selected for this purpose. At the same time we wanted to ensure the survey instrument was robust and well designed so that we could use the results obtained in the Pilot Study in extending the audit to the other eight Divisions (we were conscious of not asking staff in the two pilot Divisions to repeat the exercise).

Therefore, in designing the in-house web-based survey there was extensive consultation with the two Deans and their Associate Deans (Research), who, together with staff from the Office of the Deputy Vice-Chancellor (Research) constituted a Working Party which met on several occasions to develop the Audit’s Guidelines, Instructions and the survey Form itself.

The first draft of the Form drew heavily upon the Impact component of the Research Quality Framework, especially with regards to the self-assessment of the extent of Impact. After much revision the rating assessments were as follows:

A (highest)  
End-users have made an identifiable change because of these research findings AND the end-user community has obtained extensive identifiable benefit(s) from this change.

B  
End-users have made an identifiable change because of these research findings AND the end-user community has obtained some identifiable benefit(s) from this change.

C  
End-users have made an identifiable change because of these research findings (eg leading to a new policy/new product/new process/new behaviour).
D (lowest) The research findings have been communicated in a targeted way to end-users for whom the findings may have social, economic, environmental, and/or cultural benefits relevant to them. To date, end-users have not made any identifiable changes because of these research findings.

E Nil (no engagement reported).

The Form was designed to collect engagements associated with particular research outputs. Participating staff were asked to ensure that where collaboration with other staff was involved, each engagement was reported only once. The Audit was therefore a survey of the engagement events, rather than a measure of performance of individual staff. As transfers were not to be ascribed to particular individual staff member’s performance, and as transfers often took place over a period that was difficult to determine, the data collected could not be entered readily into the University’s research performance database. However, this was consistent with our intention to make the Audit process as non-threatening as possible to participants.

The design of the survey form made allowance for multiple engagements to be reported, and to ensure that engagements were authentic participants were asked to provide details of the relevant research end-user benefitting from the research. There was also allowance for participants to report “no engagement” soon after the beginning of the form – such participants merely needed to respond to the initial questions and then immediately submit. Again, this was designed to reduce demands upon participating staff.

Finally, it is important to note that this Audit involved self-assessment. The alternative, which would have involved staff nominating their research end-users and the University then contacting all of these end-users for their assessment of Impact, would have been time-consuming and costly, as well as suffering from the problem of ensuring sufficient compliance form the external parties. We therefore understood that the results would suffer from the same problem with all such all surveys involving self-assessment - mainly that of variability in judgement of, and reporting by, the participants. Nevertheless, the design of the Audit Form required participants to provide contact details of the cited research end-users, so that the University could follow up on individual transfers.

**Selection of Participating Staff**

In selecting staff to participate in the Pilot Study, allowance was made for the possibility that staff might be associated with knowledge transfer while not meeting the University’s definition of “research active”. Therefore, each Division was provided with a list of all of their respective staff holding research-and-teaching and research-only appointments. Deans were then asked to use their judgement in amending this list to ensure all possible individuals could be included in the Audit.

**Completing the Audit Forms**

Each eligible participant staff member in the Pilot Study was individually emailed the address of the University’s web-based Audit Form. Upon completing the web-based Form the instructions asked the participant to “submit” it. Submitting the data transferred it into a database backing the website which was periodically downloaded to a spreadsheet held in the Office of the DVC (Research).
Several reminders were sent to those staff members from whom responses had not been received. Once over 70% of staff had responded, the Pilot Study was closed – this took about six weeks.

**Results from Pilot Study**

Summary results of the pilot study are shown in Table 1, below.

<table>
<thead>
<tr>
<th>Group</th>
<th>Eligible Staff</th>
<th>Participating Staff</th>
<th>Not Participating</th>
<th>Participating Staff Reporting at Least One Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACES</td>
<td>69</td>
<td>61</td>
<td>88%</td>
<td>8</td>
</tr>
<tr>
<td>ICS</td>
<td>107</td>
<td>83</td>
<td>95%</td>
<td>248</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>176</td>
<td>144</td>
<td>81%</td>
<td>32</td>
</tr>
</tbody>
</table>

Table 1

With regards to those staff participating in the Pilot Study, the average number of transfers reported per participant over the five-year Audit period was 2.4.

**Lessons Learnt from the Pilot Study**

As indicated earlier, to the best of our knowledge it is thought that this might have been the first audit of its kind. Given the novelty, and the inconvenience to academic staff in completing surveys of this type (together with all of the competing demands on their time in 2008), it seemed sensible to test the Audit Form design out on a small but diverse group of staff before attempting to launch it to the whole University. This strategy was vindicated by the feedback obtained from participants from the Pilot Study.

- The most significant problem encountered in participants completing their forms was compliance with the Guidelines and Instructions. Despite the carefully-planned documentation on the Audit website, the Office of the DVC(Research) received many enquiries on relatively simple matters that could have been readily resolved by participants consulting the website prior to opening the Audit Form.

- A second compliance problem encountered was actually getting participants to complete the survey form in a timely way. The design of the Form was deliberately kept as simple as possible, to allow staff to complete it in 20 – 30 minutes (for each engagement reported). It took six weeks and four reminders to reach more than the targeted 70% of eligible staff submitting a completed Form (the actual figure reached was 81%).

Admittedly timing of the Audit was poor given that staff had many competing activities (new academic year, University restructuring and curriculum review, to name but a few – but then, this would be true for any chosen period), and the novelty of the Audit may also have contributed to some staff’s reluctance to participate.
- The most common complaint received from participants was that the Forms were too inflexible - there was no facility to save the completed Form or interrupt the completion of the Form, or make changes once the Form was submitted.
- The second commonest complaint was that a new Form had to be completed for each engagement/transfer reported. For those participants reporting multiple transfers, there was the problem of entering administrative details repetitively.
- Staff in the Office of the DVC (Research) found that administering the Audit was very time consuming. It was felt that expanding the Audit to all ten Divisions would involve an unsupportable workload on the Office without additional personnel or external assistance.
- When preliminary results of the Pilot Study were analysed the concerns over using self-assessment were justified. Evidently, some of the participants interpreted the rating scales incorrectly.

Part 2 – Main Audit

The Pilot Study allowed participants of that study to submit entries over a six week period from March to April 2008. A preliminary analysis of data showed a marked variability between the two Divisions participating in the exercise. ACES had a higher report rate than ICS, which was not unexpected given the engagement of the researchers in Education with schools. Nevertheless, from the limited number of participants involved in this Pilot Study, the fact that around 51% reported at least one engagement/knowledge transfer encouraged the Audit project managers to extend the exercise to the whole University.

In planning for the Main Audit, it was decided to employ proprietary software provided by an external agency. The agency chosen was Australian Surveys Research (ASR), because of this agency’s promise to deliver the following benefits:
- Survey forms could be emailed to participants individually – ASR’s experience was that customised survey processes within the HE Sector improved compliance.
- Because forms were individualised, with each participant being provided with a unique pin-number, partly completed forms could be saved and revisited in later separate sessions. Participants could also print their form, once completed, before submitting it.
- Participants could enter up to five engagements on one form (in one session),
- Although in a particular session a participant could only enter up to five engagements, if they had more they merely needed to notify the DVCRO who could then ask ASR to provide expanded space for further blocks of five engagements.
- Reminders were sent from ASR to individuals on a regular basis, relieving DVCRO staff from significant workload.
- Regular reports could be sent to the DVCRO, monitoring progress and compliance.

The basic structure of the Audit Form was largely retained so that those staff from ACES and ICS who had already completed the Pilot Study Form need not resubmit.
At the same time, the data collected under the Pilot Study needed to be compatible with the data collected under the Main Audit.

The Main Audit was open for submission of entries from end of July to the end of September. In the eight weeks that it was open, ASR monitored entries and provided reminders to non-responders on four separate occasions. In addition, the DVCRO sought the assistance of Deans and ADRs to follow up on non-responders.

ASR provided the results to the University as an SPSS Spreadsheet. Data from the Pilot and main studies were then combined to give a total set of statistics.

**Results (Pilot Study and Main Audit Combined)**

When the ASR-managed Main Audit was commenced, the 32 staff from ACES and ICS not participating in the Pilot Study were included in the Main Audit. Once the results of the Main Study were known, statistics from the Pilot Study were combined with those from the Main Audit.

A total of 797 staff were eligible to take part in the Audit. Of these 634 (79.5%) completed survey forms. A chart showing participation by Division is shown in Figure 1. Note that in 2008, when the Audit was undertaken, the university consisted of ten Divisions. Restructuring at the commencement of 2009 reduced this to four Faculties. Both structures are referred to in this Report.

![Engagement and Knowledge Transfer Audit - Participation, by Division](image)

As indicated earlier, staff could report on multiple transfers. A chart showing the number of transfers per staff member (reporting transfers) over the five year Audit period is shown in Figure 2. The average number of transfers per staff member was 2.4 (note identical to the same indicator found in the Pilot Study).
The proportion of participating staff with at least one transfer varied significantly across Divisions. The average for the University was 57.7%. However, the range in this indicator was from 36.4% to 68%. A chart showing how the results varied with Division is shown in Figure 3.

As indicated above the average number of transfers per participant reporting at least one impact was 2.4. Again there was considerable variation across the Divisions in the range 1.6 to 2.9. A chart showing this indicator by Division is shown in Figure 4.
With regards the self-assessed ratings of the transfers reported, of the 1,126 transfers reported 273 (24%) either indicated “No Rating” or “No Transfers”. The profile of the ratings for transfers rated A to D is shown in Figure 5. It is pleasing to note that staff appeared to have understood the definitions of the ratings and followed the instructions reasonable well – the profile approximates what might be expected for the definitions provided.
Moderation of Ratings

Following publication of the Preliminary Report, the DVCRO undertook an analysis of every transfer report self-rated A. As expected, there was significant variability over interpretation of the ratings by individual researchers. It was therefore decided to moderate all engagements self-rated A, B and C. This required assessing transfer reports for all engagements with these ratings.

The results of self-assessed versus moderated ratings is shown in figure 6.

The moderated profile is heavily weighted to engagements rated C and D, as would be expected. To paraphrase the definitions of the ratings, a B rating indicated not only interaction with a research end-user, but also take up of that knowledge with demonstrable change to the end-user’s practices. An A rating indicated benefit to others beyond the primary research end-user – that is, take up of the benefits of research within a sector, a State, nationally or internationally. The ratio of A plus B rated engagements to C-rated engagements is approximately what would be expected from the known literature.

An analysis of the A/B rated engagements by Faculty is shown in figure 7. As might be expected, more significant engagements were found in the Science-based areas.
Details of the A/B rated engagements were provided to the Office of Commercialisation. One of the main functions of this Office is to develop and maintain partnerships with research end-users. It is hoped that the Business Development Managers may utilise this information in pursuing the University’s strategy for improved/increased partnerships.

**Lessons Learned from this Audit**

As mentioned previously, the Pilot Study informed the Main Audit. Also as indicated previously this Audit appears to have been the first of its type undertaken in Australia (or to the best of our knowledge, the world). In the absence of any precedence, the Pilot Study was essential.

However, the fact that data for the Pilot Study was collected by a different process to that used in the Main Audit produced many problems when collation of the two sets of data was undertaken.

If the Audit were to be undertaken again it is recommended that survey data be collected in a formal database. Interrogation of this database would greatly assist extraction of the most significant results. The problem with using simple spreadsheets with the design of the survey form used has meant that it has been difficult to extract particular data sets (e.g. identity of end-users).

A second major recommendation for any future audit would be to not use self-assessment for rating engagements. In terms of cost and ease of collection, self-assessment was the method of choice for this first Audit. As is evident from this Report, moderation was necessary prior to releasing data within the University.

From a theoretical viewpoint, it would be far better to have each engagement rated by the research end-user. While this would involve a very large increase to the administrative workload and cost of the Audit, the results would be more credible. Having each engagement rated by the end-user would be equivalent to peer-review. A possible downside of this approach would be compliance by research end-users.
Conclusion

It is very interesting that this Audit, possibly the first of its kind in Australia, shows that approximately 58% of academic research staff at Macquarie University can report at least one research end-user knowledge transfer over the previous five years (2003 – 2007), and that the average number of transfers reported for that period is 2.4 per participant.

It is also very pleasing that of the approximately 850 engagements rated A to D, almost 100 (12%) involved significant knowledge transfer (rated A or B).

In summary, this audit achieved its goals in assessing the level of Impact the University’s research made in the period 2003 to 2007. The results set a benchmark for future audits.

The DVCRO
4 November 2009

The University would like to acknowledge the assistance provided by ASR in conduction of the Audit.