

Summary:

The University of Melbourne

Response to Talloires Institutional Assessment 2007

Background Note:

The following summary is structured according to the main sections of the Institutional Assessment tool. For more information on knowledge transfer at the The University of Melbourne, please refer to the main document or visit <http://www.knowledgetransfer.unimelb.edu.au/>.

1. Mission & history

The University of Melbourne was founded in 1853 and is established in the Melbourne University Act 1953 of the state parliament of Victoria. This act states that the object of the University include applying its scholarship to the benefit of the Victorian, Australian and international communities. Specifically, it should serve these interests by enriching cultural and community life, elevating public awareness off educational, scientific and artistic developments, and promoting critical enquiry and informed public debate.

While the only stakeholder group formally established by legislation is the Committee of Convocation, elected by the graduates, the University sees itself as being accountable to a wide range of stakeholders, in the spirit of he founding legislation.

The civic engagement and social responsibility objectives of the University are specified in the University's strategic plan each year under the knowledge transfer heading, as are the indicators of success (<http://www.unimelb.edu.au/publications/>). The definition of knowledge transfer at the University is:

Melbourne's knowledge transfer develops intellectual capital through a two-way mutually beneficial interaction between the university and the non-academic sectors, with direct links to teaching and research, and informed by social and global issues. The University of Melbourne's knowledge transfer is anchored in its intellectual capital, history and tradition, and a reputation for independent world-class expertise.

The University committees related to knowledge transfer include strong representation by external members, as does its governing Council.

2. Balance of Activities

The University's main campus is located in the centre of Melbourne, the capital city of Victoria, which has positioned itself as a global city with a knowledge-based economy. The priorities of the state government of Victoria include: the improvement of basic services in health; education and community safety; providing economic infrastructure for the state; and conserving water resources and promoting sustainable environmental strategies.

The University of Melbourne is currently transforming its curriculum structure with new degrees designed to include a knowledge transfer component. Furthermore, the new degrees have been developed in consultation with a range of stakeholders to ensure graduates are not only knowledgeable across disciplines, but active global

citizens. Detail of the place of knowledge transfer in the curriculum is provided in the main document, but activities include: internships, practitioner participation in teaching, fieldwork projects, community-based placements, performances and exhibitions,

The University's research spans the gamut of disciplines, with much work conducted in collaboration with external partners, who can utilize a range of mechanisms to facilitate their involvement in research internationally, nationally and locally. These mechanisms include an array of vehicles for supporting the commercial development of research outputs, collaborations formalized through formal agreements and collaborations facilitated by government grants such as ARC-linkage grants and Cooperative Research Centres (CRCs).

3. Organisation

In addition to the array of interactions the University has with its communities in research and teaching, it also has an extensive cultural program, including exhibitions and performances throughout the year, whether by students at the Victorian College of the Arts and the Faculty of Music, or professionals through the Melbourne Theatre Company and the Ian Potter Museum of Art. In all, the University owns 33 cultural collections, accessible by the public.

To facilitate community involvement in these and other parts of the life of the University, the campus is maintained as a non-gated community and the grounds are open to the public.

4. People

Since the launch in 2005 of *Growing Esteem*, The University of Melbourne's strategic vision for its future, the University increased its focus on developing structures and programs aimed at rewarding and increasing engagement with the full cross-section of the constituencies for whose benefit we were founded.

The position of Deputy Vice-Chancellor (Innovation & Development) was created to oversee knowledge transfer strategy and policy. Our engagement in the areas of cultural policy, commercialisation and alumni activity have also been enhanced.

Academic promotions guidelines are currently being revised to explicitly include knowledge transfer as a criterion, along with research, teaching and leadership.

As part of the overhaul of the curriculum known as the Melbourne Model, considerable attention has been paid to student involvement in the economic and cultural life of the community. Student volunteering has also been encouraged through programs such as the Student Ambassador Leadership Program (SALP), and the LIVE Unit, which will provide a centralized, identifiable point of contact for students considering volunteering and leadership experiences.

Furthermore, the University has continued its drive to recruit students from diverse backgrounds, including programs such as Access Melbourne, Kwong Lee Dow Scholars, Melbourne Access Program and Rural Outreach.

5. Monitoring, evaluation and communication

The University of Melbourne has surveyed the scope of knowledge transfer activity, as well as external perceptions of it. While the method adopted meant that only a

sample of the total set of activities would be recorded, 366 activities were reported from all faculties and a number of administrative units.

While this demonstrated strong internal support for and activity in knowledge transfer, this had not been communicated clearly externally. This was highlighted in market research conducted which showed more could be done to raise the awareness of the University's engagement beyond traditional boundaries. The University has consequently enhanced its approaches to communicating its knowledge transfer agenda, using a variety of media and events to do so.

This research also showed strong support in business, government and the community for the University as a rich source of knowledge and expertise, and a place of ideas, creativity and energy. In particular The University of Melbourne is considered to be an elite institution, ranked among the world's top 25 universities in the Times Higher Education Supplement (2006), with graduate outcomes consistently ranked above average in Australia (Graduate Destination Survey 2000-2005). Furthermore, in the 2007 Academic Ranking of World Universities by Shanghai Jiao-Tong University, The University of Melbourne was one of two Australian universities in the top 100, and was the only Australian university to rank in the top 100 in four fields.

Highlighted example 1:

Modelling and Control of Irrigation Channel Systems

THE suggestion that water could be more efficiently distributed through Australia's network of irrigation channels was met with derisive laughter and a chorus of "who cares" when it was floated a decade ago.

That was in the late 1990s when the University of Melbourne and water technology experts Rubicon Systems Australia began grappling with the question of reducing wastage from a vast system that accounts for 70 per cent of the nation's fresh water usage.

At that time, water was abundant, cheap and dispensable, and the term climate change was yet to enter the public's consciousness. But throughout the decade that the partners have been working closely together, a series of droughts have gripped Australia, water prices have soared from around \$20 to \$1000 per megalitre and the value of the precious resource's every drop has risen with each passing summer.

Consequently, news that the technology created by the ongoing venture between the University and Rubicon could save the 20 per cent of Australia's total fresh water volume that gets wasted in irrigation is now met with reverence rather than indifference.

Through the combination of complex mathematical modelling undertaken by a team (led by Professor Iven Mareels) in the University's Department of Electrical and Electronic Engineering and Rubicon's design and engineering expertise, the partners have patented a water management system known as 'Total Channel Control'.

The system represents a major breakthrough in irrigation technology which has operated under similar principles to those employed by ancient civilisations over previous millennia, and has increased the water efficiency of irrigation canals from a maximum of around 70 per cent to almost 90 per cent.

In Victoria's Goulburn-Murray water irrigation districts, the savings that can be made in the course of a year through the introduction of this technology amount to more than metropolitan Melbourne's annual total water consumption.

Of the 2500 gigalitres that is diverted into the Goulburn-Murray irrigation districts each year, around 750 gigalitres is lost. Urban Melbourne's residents and businesses use around 400 gigalitres per annum.

"Suddenly you are talking about almost doubling the amount of water available to the urban population without affecting your agricultural output," Professor Mareels said.

"And that can be done worldwide. Australia represents just one per cent of the irrigation market in the world. Our systems are miniscule compared to some of the larger ones in China, Afghanistan and India.

"When you start thinking about what can be realised there, potentially you are talking about staving off conflicts and global tensions over access to this essential resource."

Engineers throughout the world have tackled the problem of water loss in irrigation with varying degrees of commitment and failure over the past 30 years, but it is the complementary skills of the University and Rubicon which has yielded the breakthrough results.

Rubicon designed a revolutionary solar-powered flume gate which acts as a sensor to constantly gauge the water flow and depth, and also incorporates a zero-leak flow regulator. In addition, the gates are fitted with communications devices which use the radio network to feed data from all units back to a base station.

This technology provides water level and flow monitoring to accuracy within a range of two per cent, which ensures precise amounts of water are delivered when and where they are needed.

More than 2500 gates have been fitted to over 1000km of channels through Victoria and New South Wales, with the fully-automated operating system allowing each one to constantly adjust and manoeuvre up to 20 to 30 times a day to ensure water delivery remains accurate.

The system replaces the existing method of water flow and allocation measurement, the Dethridge wheel (invented in 1910), which provides a margin for error of around plus or minus 10 per cent.

That has led to significant wastage through Australia's irrigation systems - many of which are more than 100 years old - caused mainly by meter errors, outfalls (spillage), seepage and leakage.

But before the infrastructure could be effectively employed, the data that it yielded needed to be analysed, modelled and understood in order to provide a complete, quantitative picture of how water behaved within the channel system.

"The uniqueness is that we've got a non-complex model that represents the behaviour of water in channels and rivers, and from that we can devise optimum control systems through algorithms," Rubicon chief executive David Aughton said.

"What we have now is computer-generated data from real-time systems to inform our engineering, as compared to the traditional first principles which historically used physical data.

"As a result, we've been able to derive unique models to represent the behaviour of water in river and channel systems."

While the wastage of significant volumes of water from irrigation channels has long been recognised, it was not deemed to be worth the complexities of pursuing because the remedial measures were not cost-effective while the resource was cheap and plentiful.

That scenario has changed dramatically in recent years, which has made the decade-long partnership between the University and Rubicon as prescient as it has been productive.

The joint initiative has produced significant, tangible benefits for both parties.

"We (Rubicon) sought out expertise in this field of systems engineering and we were fortunate to have an expert in our own backyard," Mr Aughton said.

"We have worked very closely together, and have done so for 10 years, trying to solve a complex problem. But even though this is a complex problem, the University's team kept it all in check in terms of making it a real-life solution.

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“There is always a danger in academia that you might get academics pursuing a problem for the problem’s sake. But under Iven’s stewardship, this project has always focused on real outcomes”

The fact that a number of the dedicated University of Melbourne team working on the project have taken up full-time roles with Rubicon further underscores the bond between the partners.

Professor Mareels said the secret to the productive partnership was that both parties acutely appreciated their respective roles from the outset.

“The secret has been an understanding of where the boundaries are,” Professor Mareels said.

“From the start we have said to Rubicon ‘whatever you produce, you can commercialise in the water area’. That made them feel comfortable.

“And they said to the University ‘you can do whatever you want in research and in teaching, and if you want to use that work somewhere else then you can’.

“Another benefit for the University is that we get to work with real systems, with real data on a real problem that is of worldwide interest. That motivates students, it motivates staff and at the same time it poses really significant scientific problems.

“From the beginning there was recognition that Rubicon had engineering expertise in the areas that we don’t have, and Rubicon acknowledged that we had valuable know-how and understanding that they did not possess.

“We treated each other as equals, and I think that mutual respect is very important.

“We recognised that we both have valuable knowledge that is different and complementary, and together we could achieve something that we couldn’t do alone.”

Highlighted example 2

International Child Health Review Collaboration

IT'S not only the daunting size of traditional medical textbooks – about as portable as a pair of standard house bricks – that spawned the creation of the innovative 'Pocket Book of Hospital Care for Children'.

Health workers in the developing world have long been restricted by limited access to up-to-date, easily-understood medical information and evidence-based guidelines to help them tackle child health problems.

But that need has been addressed by a landmark global project – the International Child Health Review Collaboration – that has brought together more than 200 paediatricians, medical trainees, students and nurses from across 20 nations.

The collaborative project is co-ordinated by the University of Melbourne's Centre for International Child Health in partnership with the World Health Organisation's Department of Child and Adolescent Health and Development and a number of international universities and research institutions.

Among the most significant outcomes from this collaboration to date has been the production in 2005 of the 'Pocket Book' and its accompanying training CD-ROM.

The book has been translated into Portuguese, French, Turkish, Chinese, Russian, Indonesian and Vietnamese. A CD-ROM version of the text has also been developed and is scheduled for distribution by 2008.

Designed specifically for the benefit of health professionals in resource-poor countries, the book has significantly improved the quality of paediatric care in developing nations and has the potential to save thousands of young lives every year.

Associate Professor Trevor Duke, director of the University's Centre (in the Department of Paediatrics at Melbourne's Royal Children's Hospital) first recognised the need for such a resource when he was working in Papua New Guinea during the late 1990s.

He was one of around 130 paediatricians who worked with the WHO to document the evidence behind existing clinical guidelines, and then helped present them in a form that was accessible and relevant to doctors, senior nurses and other senior health workers in developing countries.

"It is designed to cover fairly much everything that a doctor or a nurse working in a district hospital in any developing country would see on a day-to-day basis," Associate Professor Duke said.

"People wanted something they could put into their pocket, and the book was written so that it didn't contain treatments, technologies or diagnostic tests that were unlikely to be available in district hospitals in resource-poor countries.

"That's the beauty of it. It interfaces with the WHO's essential medicines list and it interfaces with the sort of equipment that is likely to be available in a resource-poor setting."

When the WHO disseminated its initial guidelines to health professionals in developing countries, the literature focused largely on the management of children with serious infections and severe malnutrition.

But through their direct engagement with practitioners in the field, the WHO became aware that healthcare required a more exhaustive list of treatments drawn from evidence-based research that supported those guidelines.

Within its 370 clearly set out and carefully-annotated pages, the 'Pocket Book' addresses topics as diverse as triage and emergency conditions, coughs, diarrhea, fever, common surgical problems and HIV/AIDS.

The book's value is further increased because it has been created in consultation with child health experts who have worked throughout the developing world and are ideally placed to help shape clinical guidelines.

"This process aims to be inter-active and aims to engage people in the generation of evidence that they will use in their every day clinical practice. In that way, it's quite a shift in the way knowledge is generated and translated," Associate Professor Duke said.

The ICHRC collaboration recognised that the production of clearer guidelines in isolation would not sufficiently improve the quality of care, so the training CD-ROM was included as an adjunct to aid the implementation process.

In addition to being translated into Russian and Chinese, the CD-ROM has been adopted by Ministries of Health (in conjunction with WHO) as a basis for training courses held in the Solomon Islands, Kazakhstan, Uzbekistan, Indonesia, Eritrea, Cambodia, Fiji and South Africa.

By working with the WHO to have these recommendations and guidelines included in the curricula of university and colleges in developing nations, the ICHRC collaboration is changing health care culture as well as its practices.

Associate Professor Duke noted that this interaction provided far greater long-term benefits than the traditional reliance on 'in-service' training whereby doctors, nurses and health workers received more detailed tuition once they had already graduated into the health care workforce.

"You have to engage, so that there can be a cultural change," he said.

"You need to have implementation at all different levels of health systems, and you have to engage with teaching institutions and universities.

"It has to be taught at a pre-service or under-graduate level, and then people will carry it with them throughout their careers. If there's effort put into incorporating this sort of knowledge into under-graduate and post-graduate programs of education, then it will be sustained."

By providing health workers in developing nations with ready access to medical knowledge and evidence, the ICHRC collaboration has created incentive for health professionals to remain in their home nations which, in turn, addresses the chronic global shortage of qualified personnel in those regions.

The collaboration is a truly international project which (in addition to the WHO) includes key partners at the University of Edinburgh, the Kenya Medical Research Institute, the Aga Khan University (Pakistan), the Capital Institute of Paediatrics (Beijing) and the Institute of Child Health Buro Garofolo (Trieste, Italy).

Professor Harry Campbell, Head of Public Health Sciences at the University of Edinburgh, said universities played a valuable role in such initiatives by engaging

directly with instrumentalities to provide a broader, global response to issues such as child health.

“Universities have the expertise to lead on issues such as critical review of the evidence base for guidelines and incorporation into teaching and training,” Professor Campbell said.

“They can also be important partners in initiatives to improve quality of care for patients and, as such, the activities of the (CICH) in Melbourne are all vital and highly appropriate.

“This is an essential part of all this work and the philosophy that underpins it.

“The work has helped give prominence within the WHO child health program to the need for this knowledge transfer.”

The ICHRC website also plays a crucial role in the two-way transfer of knowledge by inviting health professionals and WHO experts to identify areas within the existing medical guidelines that would benefit from additional information or clarification.

It also allows for reviews of evidence to promote wider understanding of principles throughout the international health community.

Through interaction on the website (which recorded more than 50,000 hits in its first six months of operation) almost 50 reviews of the ‘Pocket Book’s’ guidelines have been completed.

While the internet and e-learning products have heightened the project’s level of inter-activity, Associate Professor Duke does not believe the new technology will rapidly supercede the printed version.

Indeed, given those media are only effective when computer access is available and electricity sources assured, he claims that the production of low-cost, hard copy information in book form remains among the most effective forms of knowledge transfer.

“We hope that at some time in the future, this book will be in the pocket of every health worker who is looking after children in developing countries,” Associate Professor Duke said.

“This idea will never go out of fashion.”

Web links

Centre for International Child Health

http://www.rch.org.au/cich/index.cfm?doc_id=694

International Child Health Review Collaboration

<http://www.ichrc.org/>