11 May 2005-05-11

Ms Anna Dacre
Secretary
Standing Committee on Science and Innovation
House of Representatives

Dear Ms Dacre

My attention has just been drawn to the inquiry your committee is conducting into pathways to technological innovation.

I hope you will consider this late submission, consisting of two documents:

1. A report called the Commercialisation of Research in the Humanities, Arts and Social Sciences'; and

2. "From Science to Growth", an article by Stephen Allott. He is chairman and co-founder of Trinamo Ltd., a technology sales consultancy. He is founder of the Cambridge University Computer Laboratory Graduate Association and was a Visitor at the Computer Laboratory from 2001 to 2004. From 1995 to 2001 he worked at Micromuse, a London-based software company where he was President, CFO and a main board director. Stephen took the company from £1m to £140m in turnover, 50 to 800 people and led the NASDAQ flotation. Stephen has also worked for McKinsey, Sun Microsystems and Xerox and is graduate of Trinity College, Cambridge.

The first item, the report on commercial activities of researchers working in the HASS sector, was funded by DEST. It is to be launched at Parliament House on May 30, and what I am providing is a pre-publication copy which may be lacking some formatting. Minister Brendan Nelson will speak at the launch.

One of the underlying themes of the Report is that innovation is not simply the prerogative of science, engineering and technology. The humanities, arts and social sciences have the capacity to make great contributions in this area, and the report goes some way to setting out what this contribution is, and ways in which it may be enhanced. We were, in this context, delighted to see the recent appointment to PMSEIC of Professor Iain McCalman, former President of the Australian Academy of the Humanities.

As well as contributing in its own right, HASS can play a powerful collaborative role in working with the SET sector on a wide range of issues. One example is the water problems besetting Australia in the Murray-Darling Basin. Scientists have known for decades how to solve these problems in a physical sense, but a complete solution involves behaviour change and social issues requiring the involvement of people skilled in the humanities, arts and social sciences.

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By way of background: CHASS is a newly-formed organisation, established to act as an advocacy group for people working in research and education in the tertiary sector in the humanities, arts and social sciences. More information about CHASS is available at our web site: www.chass.org.au

We would be happy to elaborate on these matters.

Regards

Toss Gascoigne

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[DEST LOGO TO GO ON FRONT BEHIND CHASS LOGO – WILL GIVE YOU A COPY OF THE LOGO SOON]

Commercialisation of Research Activities in the Humanities, Arts and Social Sciences in Australia

CHASS Occasional Paper Number 1

Commercialisation of Research Activities in the Humanities, Arts and Social Sciences in Australia

CHASS Occasional Paper Number 1

By Toss Gascoigne[1] & Jenni Metcalfe[2]

This project was carried out with the financial assistance of the Australian Government, through the Department of Education, Science and Training.

The views expressed in this report do not necessarily reflect the views of the Department of Education, Science and Training.

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Executive Summary

This report describes the commercial activities and examines the impediments and incentives facing humanities, arts and social sciences (HASS) researchers and educators at the tertiary level in Australia. It is a snapshot of who is commercialising research and how they approach this task, based on the findings of focus groups and questionnaires.

Mixed throughout the report are several case studies. These stories illustrate the tangible contribution and impact of the HASS sector in cultural, social and economic terms. The processes and benefits they set out are replicated a thousand times over in the humanities, arts and social sciences in Australia.

Services, such as research consultancy and contracting, were found to be the most common form of commercialisation amongst HASS researchers and practitioners, particularly in the area of government policy advice. This is supported by the finding that State or Federal government departments and agencies were the most frequently-cited clients. The sciences, by contrast, tend to work on solutions to environmental and industry problems and creating new commercial opportunities.

The humanities, arts and social sciences are a broad and diverse field. Different disciplines face different issues in the process of commercialisation, and there are significant variations between disciplines in the sorts of commercialisation opportunities that they can pursue and the levels of financial reward they can generate. For example, the commercial possibilities, market arrangements and standards of practice in providing economic consulting or psychological counselling services are very different from those in the creative arts. Large tenders and grants are often available for research in the social sciences and education faculties, in contrast to the smaller grants more generally offered in the arts.

The benefits of commercialisation are reported as wide and varied. Commercial work enables researchers to improve their teaching and research as it gives them a better understanding of the needs of industry. It provides students with exposure to industry practices and research experience, a valued part of their training. For individuals, it can lead to a higher profile and enhanced promotional prospects, as well as improving business and negotiation skills. The economic rewards are also important: the money allows departments and faculties to fund research units, to hire staff, and to send researchers to conferences. It affords flexibility within a tightly-ordered university structure.

For many HASS researchers and educators, money is not the driving factor in the commercialisation of their work, nor are they comfortable with the idea that commercial imperatives should govern their research activities. But they are attracted to the idea of being relevant, influential and connected to their communities. Commercial activities allow them to engage with the community by helping solve social and community problems. Regional universities in particular place strong emphasis on supporting their communities. Some HASS researchers believe that they should be adequately funded to provide community research and services free of charge.

Much of the focus group discussion revolved around the challenges and impediments to commercialisation. Such challenges included dealing with unresponsive and ill-equipped university systems, finding the time and resources

for commercial engagements, and working within funding and reward systems that recognise only a narrow band of activities. The attitudes of university administrators, departmental heads, individual researchers and their peers are seen as very important. The expansion of commercial opportunities is dependent on the existence of a research culture which recognises and rewards the sort of partnered commercial research already being undertaken in the HASS sectors.

Respondents said that while the most productive research often came from multi-disciplinary and multi-institutional collaborations, these are not encouraged by existing systems. They reported that possible sources of funding from the private sector were cut off because the Income Tax Assessment Act specifically excludes research in the humanities, arts and social science from the R&D tax concession. Respondents cited their own lack of business skills as an impediment.

Based on the suggestions of the study participants, recommendations are made across three broad areas:

- improvement of university practices to make them more encouraging and supportive of commercial activities;
- changes to government settings to recognise and reward HASS commercial activities; and
- development of new programs to equip people working in the humanities, arts and social sciences with the skills to handle commercial engagements.

Introduction

This is the first of a series of research projects foreshadowed by Dr Brendan Nelson, Minister for Education, Science and Training, on 16 June 2004. In his announcement, the Minister said:

"The Council for Humanities, Arts and Social Sciences has argued that the contribution of the humanities, arts and social sciences to Australian commercial activity and to Australian business is under-recognised.

"I have therefore asked the Council to review the many avenues pursued by researchers in the humanities, arts and social sciences to commercialise their work – including publishing, performance, licensing, and industry collaboration – and to identify specific examples of commercial impact.

"The study will involve a series of focus groups of researchers leading to a description of the commercial activities of the sector, an understanding of the incentives and impediments to commercial engagement and recommendations for changes to Government policy or new programmes likely to encourage commercial activity...

"Knowledge is important but arguably of greater importance is how we adapt to new knowledge and understand its applications. This is why Humanities, Arts and Social Sciences are so important." (Ministerial media release 29/06/04)

The purpose of this report and the others that will follow is to gain a greater understanding of the HASS sector, generate ideas to inform the policy debate, and improve the capacity of researchers in the humanities, arts, and social sciences to contribute to Australian innovation.

Objectives

This study has five main objectives:

- to define a commercial market for researchers and educators in the humanities, arts and social sciences;
- to describe the impact of current activities within this market;
- to describe the commercial arrangements;
- to gain a snapshot of the incentives and impediments to researchers and educators in this sector in commercialising the results of their research; and
- to discuss growth opportunities for the sector in commercial activities and the role for Government in assisting this growth.

Methodology

Information was gathered through focus groups and an on-line questionnaire.

The focus groups discussed broad issues relating to the commercialisation of humanities, arts, and social science research (see Appendix 1). Researchers and practitioners were recruited from the sector across a range of disciplines and institutions to talk about their experiences in commercial activities. An average of eight people participated in each focus group.

The on-line questionnaire allowed people not able to attend the focus groups to contribute to the study. The structure of the questionnaire reflected the areas covered in the focus group discussions, but also encouraged unfettered narrative responses from researchers.

The study was advertised through CHASS networks: the 99 organisations that had at that time joined CHASS; the 400 subscribers to the CHASS newsletter; and the 180 people who attended the national launch of CHASS in June 2004 in Canberra. People were invited to register their interest by completing a form on the CHASS web site, and this information formed the basis of a working database for the study.

Extensive notes were taken of all focus group discussions. These notes were sent back to all participants, inviting them to check the accuracy of the record or expand on the points raised. Econnect, a consultancy firm engaged to assist with the study, then carried out the coding and content analysis of the information from both the focus groups and the submissions.

Participants

The study involved 144 people, with 94 participants in the 12 focus groups; 48 questionnaire submissions; and two individual interviews. Focus groups were conducted in all capital cities (except Hobart), plus Townsville and Newcastle.

As it is based on a relatively small sample, this study highlights many of the key themes and issues to the commercialisation of HASS research. It provides rich descriptions of the commercial activities conducted, but is not representative of the experiences of the whole HASS sector.

Table 1 Geographical distribution of study participants

State/Territory	*Questionnaire respondents*	*Focus groups*	
		Attended	*Registered*
ACT	6	7	15
NSW	11	19	46
NT	1	2	2
Qld	15*	27	28
SA	4	14	21
Tas	2	0	0
Vic	5	19	24
WA	4	6	12
Other (overseas)	2	0	0
Total	*50**	*94**	*148*

*includes 2 interviews

Table 2 Employment of study participants

Employer	*Questionnaire respondents*	*Focus groups*	
		Attended	*Registered*
University	40*	66	91
Company	4	0	11
Federal government	0	1	3
State government	0	0	2
Government-funded group	0	7	8
Self employed / consultant	5	12	18
TAFE	1	2	3
Member society or association	0	6	9
City Council	0	0	2
Festival	0	0	1
Total	*50*	*94*	*148*

* Includes 2 individual interviews

Table 3 Primary discipline/s of study participants*

Discipline	*Questionnaire registrations*	*Focus group attended*	*Total*	*%*
History and museum studies	6	11	17	11.7
Education and training	3	12	15	10.3
Theatre studies	5	4	9	6.2
Communication and marketing	3	9	12	8.2
Arts – visual, painting, drawing, dance	4	9	13	8.9
English, literature, linguistics and languages	5	4	9	6.2
Sociology, social science, social work	2	6	8	5.5
Business/management/economics	1	6	7	4.8
Craft and design	2	3	5	3.5
Cultural studies	3	4	7	4.8
Film studies, media and new media	3	9	12	8.2
Law, politics, industrial relations and international studies	3	2	5	3.4
Music	1	5	6	4.1
Anthropology	3	2	5	3.4
Planning and policy	1	1	2	1.4
Archaeology	0	3	3	2.1
Geography	0	3	3	2.1
Philosophy	1	2	3	2.1
Psychology	2	1	3	.7
Other (biology, environmental studies)	1	0	1	.7
Architecture	0	1	1	.7
Total	*49*	*97*	*146*	*100*

*Some participants nominated more than one discipline. Others did not nominate a discipline

Context: the definition of commercialisation

The outputs and products of researchers in the HASS sector take on a number of different shapes, and it needs a broad definition of "commercial" to capture the value of this work. There is a growing appreciation, for instance, of the tangible returns offered by HASS research carried out as part of a community engagement agenda. In addition to the immediate financial returns, commercialisation adds to human or social capital (and its returns) and generates partnerships which make future commercialisation possible. Commercialisation is an investment, not just an outcome.

For the purpose of the study 'commercial' was defined as work which:

- has a market value - someone is willing to pay for it or to see it, and/or the intellectual property it represents
- is useful - it has a potential or realised application
- may involve a partner from 'industry' (any group which might apply the results of the work, such as a government department, non-profit organisation, corporation or other commercial partner)

This definition was made as broad as possible so that all HASS researchers and practitioners could contribute to the study. It also led to discussion on how commercialisation is currently defined. There was resistance by some focus group participants to a narrow and literal definition of the word 'commercial'. Many participants were more comfortable with the notion of 'utility', that the work was useful and therefore had a value. For some participants, the word 'commercialisation' had negative connotations:

> "I don't find the commercialisation word dirty – but I have trouble using it with other people. I tend not to use it as it has negative connotations when attached to an art event like ours." (Newcastle)

> "I like words like 'relevance' and 'social relevance' – I find myself pulling back from 'commercial' as this implies a specific definition of relevance. There is a risk that if we fall into one understanding of it [commercialisation] then we lose others." (Townsville)

1. The commercial market for HASS

1.1 Clients

The diversity of the HASS sector and its research is reflected in the number and variety of its clients, with Government departments or agencies at state and federal level nominated as the most frequent client for commercial activities (Table 4). This suggests HASS researchers make prominent role contributions to policy development and policy implementation.

Table 4 Clients listed by study participants*

Clients	*Questionnaire registrations*	*Focus group attended*	*Total*	*%*
State or Federal government departments / agencies	23	28	51	23.7
City councils / local governments	10	11	21	9.8
Industry and business	8	11	19	8.8
Arts industry	8	10	18	8.4
Community groups, NGOs, general public	11	12	23	10.7
Education	7	9	16	7.4
Performing and visual artists / venues	2	4	6	2.8
Museums and libraries	2	6	8	3.7
Universities, research organisations, ARC linkage grants	3	12	15	7.0
Media, film, multimedia, new media	5	6	11	5.1
Member societies	2	3	5	2.3
Consultants	3	2	5	2.3
International agencies	2	4	6	2.8
Publishers	5	4	9	4.2
Other, self generated	0	2	2	.9
Total	*91*	*124*	*215*	*100*

*Some participants nominated more than one client.
Others did not nominate a client.

'Community relevance' was considered to be one of the main drivers behind the study participants' commercial projects. The significant proportion of clients (shown in Table 4) that represent community groups, public institutions and the general public reinforces this.

1.2 Services

The majority of HASS commercial output takes the form of services (Table 5). The commercial services offered by HASS researchers are as diverse as their clients. Consultancies account for 40 per cent of all services nominated. Education packages and training, and contract research were the next most common services, accounting for a further 30 per cent of all services.

Table A2.5 Outputs provided to clients by study participants

Outputs	*Questionnaire registrations*	*Focus group attended*	*Total*	*%*
Consulting (including auditing and information services)	29	42	71	39.44
Education packages, short courses, training, workshops	9	15	24	13.33
Contract research	12	17	29	16.11
Production – IT, DVDs, CDs, media, recordings, websites	3	13	16	8.88
Publications – books, articles, magazines, editing, design	8	5	13	7.22
Exhibitions, curatorial, artwork, images	5	4	9	5
Event management and festivals	2	2	4	2.22
Member services, advocacy, governance	1	8	9	5
Performances	0	5	5	2.77
Total	*69*	*111*	*180*	*100*

*Some participants nominated more than one output. Others did not nominate any outputs.

The following sub-sections describe in more depth the types of services HASS researchers and educators engage in, based on the discussions in the focus groups.

1.2.1 Consultancies

Consultancies were conducted across a range of disciplines and activities, including history, archaeology, editing and publishing, philosophy, social science, information services and IT. Much of this work was with government - heritage, tourism, information services, health, publication management, developing strategies/plans, film making and training.

> "Mostly the humanities, arts and social sciences are involved in consultancy service activities – you are involved in cash and in-kind and value-adding to activities. The partnerships in the consultancies are fundamental to a services model of commercialisation. And even in the IT area, people don't make money out of the products but the services that go along with the product. With the creative industries, this is largely how it happens." (Brisbane)

There were mixed motives for engaging in consultancy work. Many university participants saw that consultancies could provide PhD students with an income as well as practical experience (such as project management). Others saw it as a source of funding for research and publications. In these cases, consultancy work was mostly conducted in addition to a normal teaching load.

> "We use students with at least an honours degree, employing them on a casual basis. It gives them experience of being a commercial operator. I

supervise the project and then pass it on to the client once I've checked it. It is not opinion-based consultancy, but research-based." (Brisbane)

1.2.2 Education and training

Focus group participants reported that training activities often work to link the HASS sector with science, health, policy and business. Activities included:

- online distance learning courses tailored for industry
- fee-for-service training programs and short professional courses
- collaborations or fee-for-service with government departments to develop accredited training programs
- seminars and workshops for members of associations
- running programs in other university departments

1.2.3 Contract research

Researchers had varying motivations for this work. Sometimes it was done on a full cost-recovery basis, and staffing appointments were made on the basis that contract work would fund their positions. In other cases the work was regarded as an opportunity to give staff and students valuable experience, and any profits were used to fund relatively minor activities such as travel, further research and publications.

Examples of contract research were:

- fee-for-service work such as digitising or disseminating information
- product development e.g. printer for photography
- government program evaluation
- research on policy implications and developing policy

1.2.4 Productions and publications

Some of the examples below were done on a full commercial basis, and others were carried out as part of a normal academic life, with little or no money changing hands. Activities included:

- producing and selling monographs
- producing magazines for non-academic audiences
- writing encyclopaedias for commercial audiences e.g. young people
- information management services - meta-databases
- e-publishing
- providing data, bibliographical records and mapping information
- making videos and websites

1.2.5 Research about commercialisation

A number of participants in the focus groups were involved in research associated with commercialisation pathways. HASS researchers and educators have a great deal to offer other disciplines in understanding and improving the commercialisation process, and in ensuring research provides value to the wider community and the economy. The HASS sector is an *enabler* of commercial research as well as a contributor.

Some examples of this type of work include:

- evaluating research intensive companies, and analysing how they interact with the markets and how this influences the way research was conducted
- developing metrics that capture public dissemination outcomes and describing how people outside HASS contribute to the sector e.g. biotechnology companies
- creating an inventory of people's interactions (from personal interactions to formal business linkages) with the world outside the university
- designing a research innovation incubator to generate ideas for commercialisation and which may influence teaching practices
- investigating factors that create cultural policy - film corporations and their creation within states

Case study 1: School for Social and Policy Research, Charles Darwin University

(Tess Lea, anthropologist and institutional ethnographer, was seconded to CDU from the Northern Territory Government to establish the School in 2002.)

Description

The School for Social and Policy Research was set up to focus on critical areas of community welfare, including a widespread failure to confer literacy and numeracy skills to indigenous students across the Northern Territory.

Our approach

The aim of the School is be a leader in scholarly and applied research relevant to the communities of North Australia and surrounding regions. We aim to provide responses to fundamental community concerns, influence policy-making and make recommendations for systems reform and improved service delivery.

Funding

The School received $0.5 million core funding in its first year, and in 12 months has won approximately $4 million worth of project funding. Organisations currently funding our projects include the Ian Potter Foundation, Beyondblue, the World Health Organisation, Land and Water Australia, ARC and NH&MRC as well as Commonwealth and Territory government departments, and national and international universities. Staffing has grown to 31, including five professorial, six associate professors and seven research fellows.

Projects

The School is currently working on 23 separate projects over the four themes: Education Systems Reform; Families, Youth and Children; Health Services Development and the demographics-focused People, Place and Economy. Some examples are:

Dr Gary Robinson is leading an investigation into Aboriginal mental health. His research primarily works with indigenous families to enhance parenting practices, strengthen family units, reduce children's problematic behaviour, develop children's social skills and enhance their self-esteem.

We facilitate the Scaffolding Literacy program in the NT, under a new name "Accelerated Literacy". With approximately $8m in funding, the School is working closely with the government to run "Accelerated Literacy" in 100 schools, with 700 trained teachers and 10,000 "Accelerated Literacy" trained students.

Professor Lesley Barclay is working on the reform of the health system, particularly for the Indigenous peoples in the Northern Territory.

Dr Martin Young is focussing on tourism research, and also supervises an Indigenous gambling project. Dr Ute Eickelkamp will examine the relationship between Indigenous children's play techniques and cultural transformation.

Challenges

The School grapples with the need to build and maintain a capacity for rigorous independent research, while simultaneously engaging in debate and discussion at public and policy levels.

1.3 Income from commercial activities

Discussion on income revealed wide variations in sophistication in regard to markets and pricing. Some participants had a realistic appreciation of their worth and charged accordingly; others charged a fraction of the true cost of the work. The reasons for under-charging varied, but were closely related to the motives

people had for the commercial engagement. Those interested primarily in generating income were more likely to charge full commercial rates.

> "We don't like to get out of bed for anything less than $50,000; anything less means administration that is not worth it and the project is too short to fit in with academia. We try for projects of at least 8 months duration worth from $70,000 upwards to $100,000. We're now looking to do bigger projects of half a million or so." (Perth)

Others had different motives. They wanted to do the work out of interest and knew the client could not afford full rates; or they saw non-financial advantages in doing the work, such as gaining experience for students.

> "I did $150,000 worth of consultancy work for $25,000. They asked me to do some work and I costed it, and it was four times what they had budgeted for. This was even after cutting our normal consultancy rate by two thirds." (Adelaide)

> "Some of the research we do is work that people may not be able to afford to do otherwise. There is community interest in what we do." (Melbourne).

One group examining the financial value of consultancy activities found that the work offered useful returns by enabling them to link with particular groups or test ideas, even if the consultancies did not generate significant money and were time-consuming.

Focus group participants also described commercial work that they did on a voluntarily basis:

- a professional volunteer service called Advicebank where volunteers from the corporate sector assist arts and cultural organisations with skills and capacity building e.g. develop strategic plans, or assist with human resource or IT issues;
- Bloomsday is an annual literary festival to celebrate the life and times of Irish author James Joyce. It is run by volunteers, and all income is distributed among the performers (see Case Study 6).

The amounts of money mentioned in focus groups included:

- $5 million per year at one university, generated through consultancies and contract research
- $300,000 annually for services related to the provision of video versions of lectures over the net
- $35 to print and sell monographs (including postage and handling)
- $200,000 each year from big corporations for a mentorship program in the visual and performing arts
- about $100,000 a year from selling photographic materials to documentary producers, website people, etc
- $1.2 million from Regional Arts Australia to develop a training program for volunteers
- $5 million into the university in the past 15 years through consultancies and contract research for World Bank, AusAID, ACIAR etc
- up to $30,000 a year from running training courses, e.g. for policemen
- $5,000 each time an outside broadcast van is hired out
- $21,000 for an evaluation consultancy for the education department

- $500,000 project for the education department to develop new ways of working with teachers in mathematics
- grants of $5,000 here and there with a $40,000 project seen as a big bonanza

Case study 2: AustLit – The Resource for Australian Literature

(Kerry Kilner is Executive Manager of AustLit (www.austlit.edu.au). She is based at the University of Queensland.)

Description
AustLit: The Resource for Australian Literature is a not-for-profit internet resource for research and teaching of Australian literature. It contains information about Australian writing and writers, with descriptive records on 79,000 authors and organisations and more than 470,000 records relating to Australian literary works.

AustLit is a subscription-based service for researchers, librarians, teachers, students and the general public and is an important resource for Australia.

Income
Auslit's annual operating budget of about $900,000 is variable and project dependent, and is mostly spent on staff. Subscription income, however, only produces approximately one quarter of its current operating costs.

Auslit has been involved in a number of $15,000 to $50,000 grants to undertake special research projects, which both help build the central data reserve and support work published within AustLit and as books and articles.

Challenges
The issue of funding is ever-present. The public libraries and schools which might normally use Auslit are financially stretched meeting their immediate needs and may not be able to purchase our services.

1.4 Funding of commercial activities

Questionnaire respondents were asked: "Who has helped to fund your commercial activities?" The variety of funding sources (see Table 6) emphasises the breadth of the commercial work performed by HASS researchers:

Table 6: Sources of funding for commercial activities: questionnaire respondents

Source	*%*
University	22.4
No funding for activities	20.4
Funding bodies or programs - Arts Councils; ARC; Cooperative Research Centre (CRC)	16.3
Small companies	10.2
Local government	8.2
Personal	6.1
Colleagues	6.1
TAFE	2.0
Start-up business	2.0
US foundations	2.0
Banks	2.0
Federal Government	2.0

When asked: "Why did they [the funding sources] get involved?", respondents offered a range of reasons:

1. to develop their own personal and professional relationships by funding or co-funding projects
2. to take advantage of moves by universities to gain external funding
3. to gain access to the expertise of researchers with a national reputation
4. to work with researchers with the expertise to fulfil the demand for social research outcomes required by government agencies and research organisations
5. to return to a provider of goods and services which has already delivered good products
6. to invest in artworks

Focus group participants identified Government funding programs offered by the ARC (Australia Research Council) and NHMRC (National Health and Medical Research Council) as one source of public funding. The idea of applying for ARC Linkage Grants was fairly new to HASS researchers, many of whom were still finding their way. Linkage Projects were viewed positively by those familiar with them.

1.5 Commercial arrangements - collaboration

Collaboration is familiar territory to many areas of HASS. Study participants reported it was more difficult to work on creative projects in isolation, particularly in the areas of performance, music or video. Collaboration was becoming more

common in other HASS disciplines and was perceived to be an important part of the commercialisation process:

> "I am involved in research under the umbrella of social change and we try to have industry and government partners in everything we do. We have to have these partnerships if we are to get anything done." (Brisbane)
>
> "All our funded work is in collaboration with external bodies – professional bodies, non-for-profits, industry etc." (Perth)
>
> "We have showcased what we are doing but we have also asked people about the issues they are facing and whether our researchers could address these needs. As a result, we bring together people across nine schools in cross-disciplinary collaborations." (Townsville)

Some universities were already involved in the creation of super-faculties involving a wide spread of disciplines and enhanced services. This sort of collaboration was perceived to come from deliberate management decisions to produce certain outcomes, rather than from researchers themselves.

The reported drivers of collaboration were:

- funding imperatives, in cases where the only work which could attract funding was collaborative
- activities and projects which required collaboration to get results
- situations where shared resources and shared information would help generate and support commercial activities
- the need to strengthen external relationships for the survival of the research group
- people working at the boundaries of disciplines (for example business and economics, psychology and philosophy)
- the needs of science to link with social science (for example, performance and drama with health, and creative arts with ecology and geography)

Collaborations could involve:

- many different universities, or different schools or faculties within a university/universities
- government departments or government-funded organisations/enterprises e.g. the National Library of Australia
- industry, companies and large corporations
- professional bodies
- non-profit organisations
- community groups and sectors such as indigenous groups

The following sub-sections look in more detail at the partners to HASS commercial work, as discussed by the study participants.

1.5.1 Research centres

Research centres were seen by focus group participants to be a useful avenue for generating funds for research. Such centres were seen to have a greater capability to apply for competitive grants than individual research units. An additional value of research centres was their role as umbrella groups for conducting research/industry activities where resources were shared.

1.5.2 Advocacy organisations

Advocacy organisations were also identified as partners in collaborative research. Examples of these groups include:

- Craft Australia, a national advocacy body for art and design
- Australian Council of Professional Historians, a professional body raising awareness of the skills historians bring to commercial projects
- Australian Business Arts Foundation, which aims to increase corporate sector support for Arts
- National Association of Visual Artists
- Australian Society of Authors, which establishes standards, represents authors and works through disputes with publishers
- Queensland Artworkers' Alliance
- other organisations representing the interests of musicians and actors

1.5.3 Commercialisation units of universities

While there were mixed views on the value of the commercial units within universities, some participants recognised the assistance they provided in:

- contract negotiations
- pricing of projects
- protecting IP
- salary reimbursements
- advising on the Trade Practices Act and competitive neutrality

But one third of questionnaire respondents reported that their institution had provided no assistance when they wanted to commercialise their activities.

A number of focus group participants believed a business plan (or a budget plan) was important. While many research groups and organisations had a business plan in place, participants from universities were less likely to have one.

Case study 3: Histori\|co Research Services, the University of Queensland

(Geoff Ginn was appointed lecturer in the School of History, Philosophy, Religion and Classics in January 2002, and immediately established Histori|co. This is his first academic appointment.)

Description
Histori|co provides commercial consultancy services in applied historical research, for heritage assessments, environmental impact statements, community development projects, or historical archaeology.

Management
I fit the task of running Histori|co in with my full-time academic position, and use postgraduate students to work on projects on a casual basis. A crucial aspect of the management model has been my previous experience as a professional historian in the heritage sector.

Business model
The business was established under UniQuest, and clients requiring commercial historical research engage Histori|co at professional daily/hourly rates and usually for short-term work as a sub-consultant to larger tenders. Our industry clients are heritage consultants, architects and environmental managers.

Income
We charge professional fees from $800 to $15,000 for individual projects, and our average annual turnover is $25-30,000. The advantage of small projects is fast turn-around, manageable workload and a good profit line.

Outputs
In the first three years Histori|co worked on thirty projects. Our reports are derived from historical research in primary and secondary sources and are generally not expected to result in formal academic publication. We can undertake field assessment and oral history for the purposes of community consultation if required.

Challenges
Workload management is the key challenge. The solution is partly achieved through the relationship with UniQuest which looks after accounts, GST, payroll and insurance (for a fee). This enables me to concentrate on the projects.

Benefits
Histori|co provides income and vocational experience to graduate students. It has boosted recruitment, ensured curriculum remains abreast of industry practices, and provided a modest but useful income. Partnerships with key industry and government players may serve as the basis for ARC Linkage-style grant applications in the future.

2 *Incentives to commercialise*

Participants identified many benefits of undertaking commercial activities. It allowed researchers to be relevant and to give something back to their community or region. Commercial work improved staff performance in both research and teaching, and it could lead to a higher profile and improved promotional prospects. It provided additional money to undertake research or support other activities. One third of the respondents saw commercial activities as fundamental to their existence.

The rewards identified by study participants are listed below. They are ordered by the number of times these factors were raised by participants, beginning with the most frequently mentioned.

2.1 Relevance

Many researchers were driven by the need to be relevant to government, industry or communities. For these researchers, money was not the driving factor: rather it was the influence of ideas and the dissemination of knowledge for change. Engagement models, which promoted access to education and new information, were seen to be more appropriate than commercial models which locked up information in intellectual property (IP).

> "An urban economist is linking with a senior academic in architecture through an ARC Linkage grant involving Mirvac (a large property developer) to explore the design needs of baby boomers. Mirvac is not particularly interested in IP as it already has a leading place in the market, so the research results are largely for the public good - looking at housing futures for Australia's largely urban population." (Melbourne).

> "I love going to interesting places working with interesting people over issues that governments have struggled with for generations. They look to us for rigorous information that influences policy. It is not about money." (Perth).

Regional universities, in particular, believed they had a special mandate to support communities. Engaging with communities was seen as a priority activity. They expressed concern at the 'publish or perish' mode of thinking, and were very critical of the detrimental effect this may have on engagement with the community.

The questionnaire participants nominated commercialisation as helping them "widen the audience for research". Research could be applied to important social and community problems and was therefore more meaningful. Community engagement enabled them to reach new audiences, and commercial activities assisted them to understand the needs and workings of industry. Through that, they improved their own work performance.

Some participants reported increasing opportunities for collaborations between universities, businesses and the community:

> "One of the things we're increasingly looking for is a third party – the community. Businesses want to engage with charitable community groups plus the arts organisations. There are a growing number of businesses that ... want to be seen as being part of the community..." (Sydney)

Case study 4: People, Identity and Place – research at James Cook University
"It's a community service"

(Dr Sue McGinty is Associate Dean Research in the Faculty of Arts, Education and Social Sciences at James Cook University.)

People, Identity and Place is an interdisciplinary network of researchers which provides research and consultancy services to regional communities. It aims to meet local demand for research using a regional partnership approach.

Here are four examples of research projects:

The Disengaged Youth Program
Young people taking themselves out of the education system prematurely is a big issue in North Queensland. This project sought to understand their reasons.

Swimming with dwarf minke whales tourism industry
The tourism industry wants to establish this popular tourist activity on a sustainable and environmentally sound basis.

JCU pre-service teachers' rural and remote professional experience
Pre-service teachers are reluctant to undertake professional experience in rural and remote locations because of financial, social and cultural issues. This project provides basic information to help make practicum sessions in these areas more attractive.

Centre for Disaster Studies
David King is working to draw up disaster mitigation plans for Pacific Island countries and local Australian shire councils.

Partners
We have collaborations with Education Queensland, Indigenous Communities, the Great Barrier Reef Marine Park Authority, the Department of Emergency Services, Bureau of Meteorology, Queensland Health, the Department of Child Safety, regional Councils, and the Department of Education, Science and Training.

Challenges
We have more demand than we can handle! Partners readily put themselves forward, usually with some funding. Our role is to seek extra funding from both internal and external sources.

Benefits
The cultural, intellectual and social benefits to our region are enormous. These activities support the university's teaching program, provide opportunities for students to gain practical experience working on real issues, and above all strengthen and enrich our regional community. The financial returns are not great, but do provide a handy source of funds for the Program.

2.2 Collaboration

One of the main benefits from commercial activities was identified as the opportunity for collaborations. This could take the form of working with people outside the university system, from government agencies, businesses or industry; or conducting research projects with colleagues from other disciplines.

> "There's a willingness to engage across disciplines - people do want to engage. This means a different way to approach things. People could come

together over a problem or an issue. This way the problem or issue is put first before the individual academic interest." (Sydney).

The CRC scheme and the ARC Centres for Excellence scheme were identified as examples of programs that successfully promoted collaborations between researchers from HASS and the sciences.

More generally, the benefits arising from collaborative commercial activities were identified as:

> "Access to expertise and activity outside the University."
> "New contacts and partnerships that assist the research."
> "Stronger relationships that lead to greater research funding."

A number of respondents said that academic courses at universities should reflect the increasingly collaborative nature of research, with a review of existing courses and the development of new interdisciplinary courses.

Building viable collaborative relationships with government, industry and the community was seen as more important than pursuing short-term commercial opportunities, even at the expense of immediate financial returns. Participants said that the value of these linkages was sometimes underestimated by their university.

2.3 Financial Rewards

Some focus group participants said commercial projects earned enough income to subsidise research in other areas, buy equipment, pay staff salaries and attend conferences.

For other researchers, the income enabled them to pursue their own interests and afforded them a degree of flexibility from what they saw as constraining university structures. A project only has to break even for it to be deemed successful.

Questionnaire respondents used income from commercial work in similar ways: to fund research, assist with student work and provide them with greater independence from university structures.

Case study 5: Archaeology Program, La Trobe University

(Tim Murray joined the Archaeology Program in 1986 as Lecturer and was appointed Chair of Archaeology in 1995.)

Description
We do heritage consultancies for government agencies and the private sector, and these have been incorporated into the teaching program. We wanted to expand teaching and research by developing an income stream.

We appointed an adjunct professor from Godden, Mackay and Logan. He teaches in the Program and recruits our graduates into his company. We have worked with private companies on excavations which have provided opportunities to commercialise research into the historical archaeology of urban Australia.

These activities are linked closely with funding from the ARC. Our research projects involve collaboration with Heritage Victoria, Historic Houses Trust of NSW, Sydney Harbour Foreshore Authority, Sydney City Council, NSW Heritage Office, private companies, and the Museum of Victoria.

Business model
In the commercial collaborations with GML, La Trobe has provided expertise in the development of project research designs and excavation and analysis, as well as logistical support and equipment. These collaborations have required agreements setting out the obligations of the parties and the disposition of intellectual property.

Income
Income to La Trobe has been of the order of tens of thousands of dollars, and there is also funding from the ARC Discovery and Linkage grants.

Partners for the Casselden Place Project, Melbourne
Initial funding came from the ARC, and we were joined by two major Australian archaeological consultancies to work on the archaeology of an entire city block. It was so large scale it was beyond the scope of a single academic department and required a level of funding that could not be provided by the ARC.

Outputs from Camp Street, Casselden Place
Outputs include teaching kits for school students, CD ROMs for the general public, input into museum displays and public programs, several heritage consultancies, hiring of graduates into heritage archaeology industry, and academic publication.

Challenges
The major challenges have been to develop workable IP agreements.

Benefits
Apart from the money, our commercial activities have supported teaching programs, provided students with vocational experience (and better job prospects), and increased publicity for the Archaeology Program and La Trobe University.

We now have a much greater capacity to take abstract research and demonstrate its significance to industry and the general public. Our work in Melbourne has raised public interest in historical archaeology, and demonstrated to industry that archaeological heritage management can add considerable value to developments.

2.4 Promotion and careers

The policies of individual universities on consultancies and commercial activities were crucial in determining how researchers viewed these activities in terms of gaining promotions (see Section 3.1).

While some focus group respondents were reluctant to get involved in consultancies because they felt that promotions were largely decided by the ability to obtain research grants, others said that engagement in commercial activities was beneficial to their careers:

> "I put everything [to do with commercialisation] through the university and that results in far more infrastructure than I put in. I don't find it such a problem. I get recognised though promotions and gaining an ability to do what I want." (Sydney).

Questionnaire respondents were also positive, saying that improved skills and knowledge gained from commercial activities were beneficial and could lead to expanded job projects. They also nominated a higher profile and reputation as benefits.

> "I need to do [commercial] work that maintains my international image." (Adelaide).

ARC funding was perceived to be of greater value and status to career advancement than contract consultancy work. The high success rate and high prestige of an ARC Linkage grant, and the fact many university commercialisation units understood and were comfortable with the grants, made that funding source particularly attractive.

2.5 Student training

Engaging in commercial activities and developing relationships with industry had benefits for students:

- training opportunities for students in project management and business skills
- networking opportunities to help students find jobs on graduation
- linking to industry so that teachers have a better understanding of industry needs
- providing guest lecturers to give context to the courses

Focus group participants said:

> "We see lots of benefits to going out to organisations, and use the relationships for other things like sending students out to complete their assignments. There are a lot of benefits from building relationships. You can also invite people back into the classroom." (Melbourne)

> "I bring in commercial people to talk to our students.... My commercial work certainly contextualises the work we do." (Newcastle)

Case study 6: 'Bloomsday in Melbourne Inc.', Deakin University

(Frances Devlin-Glass is Director of Bloomsday in Melbourne Inc. She is based at Deakin University.)

Description
Bloomsday is an annual literary festival to celebrate the life and work of Irish author James Joyce. We have mounted eleven festivals in Melbourne, and one each in Kobe (Japan), and Dublin.

Management
The organising committee has about ten people, some from a literary or theatrical background, others with IT or accounting skills.

History
The festival began in 1994 with professional actors and amateurs performing readings of Joyce. Now they perform original scripts, including plays, oratorio, film, ballet, and a seminar. There is strong competition for tickets.

Business model
We run two fund-raisers per year to pay for venues, costuming and lighting and deposits on meals; and to guarantee payment for actors. We no longer waste time applying for grants - the rules keep changing and our company does not fit the model of a regular theatre group - and so the group has become self-financing.

Income
The festival runs on about $5000. All income is disbursed among the theatre directors, professional actors, musicians and paper-givers. A festival can employ up to 50 arts personnel.

Partners and sponsors
The festival is a fruitful collaboration between scholars, writers and fringe theatre professionals, and research underpins the theatrical offerings. Deakin University sponsors the venture as useful outreach, application of literary intellectual capital and good for the University's reputation.

Challenges
Our most pressing challenges are living up to our past successes, and organising a grass-roots cultural event with a small honorary committee.

Benefits
The greatest benefit is the ongoing debate with one of the greatest minds of the twentieth century. Many of our committee members are writers who find their own work much enriched by their encounters with Joyce. We have generated about 140 original scripts.

2.6 Skills development

Although this was not specifically mentioned by focus group participants, a number of questionnaire respondents said that their skills and the skills of their students improved after they had engaged in commercial activities. Specific changes and skills include:

- an increased willingness to work collaboratively and negotiate activities with industry partners
- an increased ability to keep up to date with commercial partners
- the need to keep industry partners up to date with research
- a recognition of the need to work at establishing relationships - "to spend much more work on the ground" - when setting up joint proposals
- improved communication, presentation and writing skills
- improved ability to deal with contracts involving copyright, IP, ethics
- improved ability to manage financial records

2.7 Spin-offs

Study participants noted that commercial projects where solid relationships with industry were developed and maintained increased the likelihood of the initial research project developing into subsequent work. Whilst these relationships were seen as hard work, it was deemed worth the effort.

2.8 Changing attitudes

Whilst it was generally thought that much more change was needed, a number of focus group participants commented that the attitudes within some universities towards commercialisation had already begun to change:

> "Some of the promotion criteria are customised – and there is no doubt that those earning money are highly approved of in the system." (Adelaide)

> "The University certainly [supports us] now. Up until a couple of years ago any commercial funding that came in was not a big thing – but now this is seen as part of one bucket and we are encouraged to do this." (Melbourne)

3. *Impediments to commercialisation*

Many impediments identified in the study are associated with a system still adjusting to modern expectations of commercial engagements. In some cases issues are being addressed; but the effect of other impediments has yet to be fully recognised.

Impediments commonly identified were: unresponsive university systems, reward systems which recognised only a narrow band of activities, a lack of time and resources for commercial engagements, and coping with confusing policies. Participants complained about minimal encouragement for multi-disciplinary and multi-institutional collaborations, and commented on their own lack of business skills.

These issues are explored more fully below. They are listed in order of priority according to how often they were raised in the focus groups. An interesting contrast between the focus group participants and the questionnaire respondents is that the former focused on government and funding issues, while the latter focused on university and communication issues.

3.1 University promotion

Focus group participants reported that a major barrier to commercialisation is the way promotions are allocated within their universities. To be considered for promotion, academics need to have an acceptable publication record, and to contribute to their institution's research performance under the Government's performance-based funding schemes. Many participants reported that there was limited recognition of many of their commercial activities.

This position was compounded for researchers who produced research outputs such as CDs, films and exhibitions. These activities gained little or no credit as they did not gain performance funding "points" under the system.

> "Commercialisation is not seen as a benefit towards promotion, it is not valued or supported." (Brisbane)

As a result, academics reported wrestling with the definitions of their projects and consultancies in order to squeeze them into a points-gaining category

> "I have a problem about what is research and what is not. Take classroom development. You can frame it in the research agenda or you can frame it as developing new programs. It is often seen by DEST as developing new programs, which is not considered research. Whether it is research, consultancy or program development makes a difference with getting points. This makes a difference to whether we do or don't do the work. It gets very confused. It takes so much time to renegotiate boundaries all the time. I have spent so much time to renegotiate boundaries on things I thought we'd clarified." (Perth)

3.2 Identity and culture

There were mixed views on the responsibilities of researchers engaged or not engaged in commercial activities. Some researchers believed their role was to

teach and do research, and not to look for commercial opportunities. Others thought that undertaking commercial work would affect the integrity of their research, or saw commercial activities as beneath them.

> "There is an absolute gulf between university and commercial mind sets – you have almost by self-selection a group of people in universities who have a public service duty view of life, which is why they are not in the business area." (Perth).

Others had a much more positive view of commercial work and saw it as central to their professional life. They felt that at times it was not given appropriate recognition in the university system. One respondent said that more recognition needed to be accorded to the differences with commercial activities in science and technology:

> "When you try to tack on business things to this [HASS] environment, people do not feel comfortable. Academics feel pushed into the delivery of widgets, which is not why they are there in the first place. I am in university and have been working in public sector all my life so I understand this. But if the government is prepared to give encouragement and kudos to certain outcomes – then this sector would come along [as long as it] realises HASS is different to the sciences." (Perth)

This range of attitudes was reflected the responses to the question in the questionnaire: "What has been the attitude of your colleagues to your commercial activities?" (Table 7):

Table 7: Attitudes of colleagues towards commercialisation: questionnaire respondents

Attitude	*%*
Supportive/positive	25.0
Disdainful/hostile	14.6
Indifferent	10.4
Envious	6.3
Admiring	6.3
disdainful/hostile	4.2
Mixed	4.2
Competitive	2.1
Ignorant of opportunities	2.1
Opposed to change	2.1
No response	22.9

Whilst a significant proportion of the responses were positive, the findings suggest that there is still some way to go before commercial activities in the HASS sector are viewed and supported as a legitimate research pathway.

3.3 Funding

Universities were reported as being less well-funded than they used to be, and looking more towards private funding, funding partnerships and other sources for income.

Focus group participants said that they felt a greater demand to generate external income themselves, to supplement normal funding but that industry was less forthcoming than it had been. This was partly because corporate organisations were growing more wary of developing and supporting new ideas, and partly because researchers were operating in an external economic environment they characterised as negative. They said issues such as corporate governance, GST and weak tax incentives for HASS research contributed to this.

The Income Tax Assessment Act was mentioned by respondents, because it specifically excludes research in the humanities, arts and social science from the R&D tax concession. If the tax incentives are weak, there is less incentive for companies to buy in expertise from outside and it is harder for university researchers to sell their services.

Many organisations that would benefit from university expertise were reported as not being able to afford to make the cash contributions (e.g. theatre companies) required to attract a Linkage grant.

Finding alternative means of funding was seen as especially important for commercial work unlikely to run at a profit (eg Case study 2: AustLit – The Resource for Australian Literature). This type of work is undertaken where researchers or practitioners can see other benefits (such as knowledge dissemination, student training or the improvement of teaching practices), but recovering at least part of the costs is important for the survival of the project.

Participants also reported a downsizing in the arts with only the major universities still offering the breadth of activities once available. In some cases, researchers could obtain funding only for the service aspects of a commercial project, and not the supporting research.

There was concern by focus group participants that funding arrangements failed to reflect cross-institutional partnerships, with the host university getting the kudos.

Some participants reported that core funding stopped when their commercial activity started generating income. In some cases this occurred before the full-cost of the project was recovered and was considered too early in the life of a project.

3.4 ARC – Linkage Grants

The ARC and its Linkage Program was regarded positively by study participants, and as an active encouragement to HASS researchers to look beyond the university for funding. They suggested the Program could be improved if the following issues were addressed:

- appointing more people to the reviewing panels with expertise in the commercialisation of research in the humanities, arts and social sciences
- allowing poorer organisations to offer in-kind contributions rather than cash contributions
- including creative output and applied research as research credits when applying for Linkage grants
- speeding up the grants process, in line with industry expectations
- expanding the program to cover bigger projects and fund more collaborations
- creating greater opportunities for regional areas, who are disadvantaged by the need to travel to capital cities to negotiate partnerships

- recognising the benefits of research that may produce longer term commercial benefits than just a product (e.g. relationship development and knowledge dissemination)

3.5 Managing activities – resources and time

Managing commercial interests while developing and protecting student and staff interests was identified as a problem by focus group respondents. Time constraints on a full-time academic were identified as the biggest impediment in running a collaborative program.

> "One of the difficult things in humanities is getting grants for time release. I don't employ a team of researchers, but need time release from teaching. This is a big issue." (Adelaide)

This was compounded by the need to acquire new skills to manage the commercial project, in an environment which provided only limited access to advice on business and legal issues.

> "I am trying to play two things – commercial undertakings on a project-by-project basis... [while] developing and protecting student and staff interests. But I am very under man-powered and under-skilled in legal frameworks, negotiations, etc." (Brisbane)

> "We have an issue of project management – this has been a major disincentive for taking on projects. People would like to do things but don't have experience in contracts; and it really needs someone not involved in teaching, administration or research full time." (Melbourne)

Many thought there was a potential corruption of work by commercial pressures, and others were concerned that commercial activities might cause them to lose contact with their field.

3.6 Intellectual Property (IP)

Many focus group participants saw intellectual property (IP) as a minefield. Ownership, protection and student IP were reported as causing many commercial ventures to falter. Respondents said they did not know the best way to protect their ideas, whether by taking a patent, or being first to market, or applying it for public good.

Lack of consistency across institutions, and the absence of simplified common documentation were identified as significant hurdles.

> "The thing I find problematic is the IP. Our university's policy is that the IP flows on to the academic. But if you work with partners, it becomes very murky and being able to exploit your own IP becomes problematic – we don't have legal expertise." (Sydney)

Participants identified the following needs:

- for consistent IP policies across universities, and standardised contracts
- for common approaches to the ownership and protection of student IP
- for access to good advice on the most appropriate way to exploit IP

3.7 Lack of skills

Lack of commercial skills was identified by many participants as a handicap. They identified possible solutions:

1. the provision of training in this area for researchers contemplating commercial activity;
2. access to experts on commercialisation process within the tertiary sector; and
3. the provision of templates covering common processes, including IP agreements, outline business plans and other aspects of the commercial process, possibly made available on the web.

Areas where researchers wanted training were:

- writing business plans
- developing relationships with business and government people
- developing partnerships across disciplines and with industry
- identifying and supporting entrepreneurs
- understanding the 'market' and IP for their ideas and products
- dealing with business systems – invoicing, contract writing, GST, etc
- project management

> "My take on this is that there is not a reluctance by people to learn about business practices. We put together forums on these topics and these fill up very quickly – people want to learn business practices." (Sydney)

Others were unaware of the true value of their skills and the services they offered. Some confessed total ignorance of the concept of 'competitive neutrality':

> "Competitive neutrality is about ensuring that researchers compete fairly in the market through transparent cost identification and pricing. By stating the true costs of the work to be undertaken it removes any advantages gained from working within a public system.[1]"

3.8 University structure

There was a general view that the structure and frameworks of universities are not conducive to commercial activities. While participants reported some areas of improvement, universities were seen as unresponsive to the pace of commercial activity, with rigid legal and financial systems an impediment to collaboration with external parties. It was reported that many universities were removed from the 'market' and waited until business recognised the value of their research and came to them, rather than actively engaging with the market.

The universities were perceived to put up stumbling blocks that discourage people from moving outside the established system. Some participants said they preferred to avoid the red tape and costs, and make their own arrangements as individual contractors rather than go through the university system (even though this incurred additional costs such as insurance).

> "One of the issues with the sector is that it needs to be responsive. The challenge was to set up the administrative processes so [the commercial activity] could quickly roll in and do the consultancy in a very short time.

[1] This definition was adapted from the Victorian Department of Treasury and Finance website, http://www.dtf.vic.gov.au/ncp/cn_overview1.htm

> Trying to act on something quickly is a big challenge given... [our] teaching, research and admin workloads." (Brisbane)

There was significant confusion about how the financial rewards of commercial activities were shared, and people reported that the incentives to be commercial were limited given that it took them away from the valued activities of research and teaching. There was also concern by focus group participants that funding arrangements failed to reflect cross-institutional partnerships, with the host university often getting the kudos for the commercial research.

A third of participants stated that they received no support from their institutions, a significant barrier to commercialisation. A key issue was the lack of appreciation of the nature of HASS commercialisation by people in the support system.

> "The university is supportive but there are not enough people in support units who understand the work we do. When they think 'consultancy' they generally think science, engineering, business, etc." (Sydney)

> "[The university] encourages centres to engage in commercial activities, though I suspect our 'product' is a little too difficult to comprehend. Bridges and agricultural equipment are another matter..." (Questionnaire respondent, Queensland)

A number of researchers would prefer to offer their services free of charge, especially to community groups, but know this may not be acceptable to the institutions in which they work.

Case study 7: iLecture, Multimedia Centre, University of Western Australia

(Michael Fardon is the Academic Director of the Multimedia Centre, University of Western Australia.)

Description
iLecture makes video recordings of university lectures available for playing back over the web, on demand 24 hours a day. Last year 6500 lectures were recorded at the UWA, and the web site scored 250,000 hits. The system can be used to record other events such as seminars and recitals.

History
The iLecture System was the first significant commercial experience for the Multimedia Centre. We were helped by the UWA's Office of Industry and Innovation (OII) with commercial issues, including the establishment of a spin-off company Media Farm Pty. Ltd. to exploit opportunities for the technology.

Business model
iLecture customers buy a licence to install and use the system, and pay an annual maintenance fee directly to the Centre. The license fee is shared between the University, the Multimedia Centre, and the inventors. Initial funding was provided by the University, the Faculty, and Apple Computer Inc. Annual income for 2005 is projected at $300,000, and the iLecture component of the Centre is the equivalent of two and a half staff members.

Challenges
The major challenge has been the investment of time and energy of the three inventors. Universities are traditionally not well placed to respond to strategic opportunities.

Other challenges included: paying programmers at commercial rates, coping with a signing authority policy that hampers relationships with product vendors, and responding in a time-frame appropriate to commercial operations.

One final challenge has been the perception of commercialisation within the university environment, particularly within an Arts Faculty context. The Multimedia Centre has expanded significantly, while many other areas within Arts are struggling financially in the current climate.

Benefits
There is a clear financial benefit. The Centre's commercialisation activity has enabled us to develop our program, and other capacities in which we perform and document our work.

4. *Recommendations*

1 Understanding, promoting and publicising the value of HASS research

Recommendations to disciplinary, teaching and advocacy bodies in HASS

Encourage and support the HASS community to engage in more commercial activities by:

- publicising the value and significance of HASS research to the public, industry, Government and researchers through the media
- promoting the benefits of commercial activities to researchers
- promoting the value to industry of commercial partnerships with HASS
- encouraging media training for HASS researchers
- gaining a better understanding of commercialisation in the HASS sector though further studies
- promoting recognition that some commercial activities have a social benefit rather than a financial one

2 Standard practices across the tertiary sector

Recommendation to the universities

Encourage HASS researchers to engage in commercial activities by providing better advice and support, and by working towards standard practices across the tertiary sector. This toolkit approach would include:

- building a national network of commercialisation advisers in the tertiary sector through websites and workshops and a national conference
- creating pro forma documents covering common commercialisation issues such as contracts and IP agreements, to establish national standards and avoid duplication of effort. These documents should be used by researchers under the guidance and interpretation of business managers
- providing researchers with mentors experienced in commercial activities

3 Build business skills

Recommendation to the universities and funding agencies

Build up the business skills of HASS researchers by running courses covering:

- appropriate costing of research
- project management and assembling teams
- building and managing relationships, networking, developing partnerships across disciplines and across institutions
- understanding the market and writing business plans
- dealing with business systems - invoicing, contract writing, GST etc
- competitive neutrality and the Trade Practices Act
- valuing IP (and understanding what needs protection, what is not worth protecting, and what can best be exploited by being first-to-market)
- government programs of support
- familiarity of industry and business practices, for research students

4 Amend programs and settings

Recommendation to the funding agencies, universities and Government

Amend Government programs to improve their accessibility and value to HASS researchers by:

- designing metrics that capture the various outcomes of HASS research and facilitate their use in matters of funding, promotion and reward systems
- allowing eligibility for the R&D tax concession for research in the humanities, arts and social science by amending the Income Tax Assessment Act
- introducing more flexible timing, simpler application forms and compliance costs, and quicker advice on applications
- encouraging collaborative and cross-disciplinary approaches (especially with science) by improving and promoting funding programs
- recognising all partners rather than just the host university in cross-institutional arrangements
- recognising in-kind as well as cash contributions in ARC – Linkage Program applications, so that organisations without cash can still participate
- appointing more people with experience of commercial activities as peer reviewers of funding applications

5 Provide incentives to undertake commercial work

Recommendation to the universities and funding agencies

Encourage HASS researchers to engage in commercialisation work by:

- recognising the role of commercial activities in improving the knowledge of teachers and the educational experience of students
- providing more service support and release from normal duties to enable researchers to manage their commercial activities e.g. time-release arrangements to enable researchers to work with industry partners
- publishing clear guidelines on consultancy and external work, and establishing a clear position on how the financial rewards from commercial activities are shared between the researcher and the university
- setting up 'creative commons' or research centres or precincts to stimulate research commercialisation
- amending financial and legal systems perceived as too rigid to encourage commercial activities
- employing specific people to pursue opportunities to undertake research (knowledge brokers)
- recognising that some commercial activities have a social benefit rather than a financial one

6 Improve industry awareness

Recommendations to disciplinary, teaching and advocacy bodies in HASS

Improve the awareness of potential industry partners of the possibilities and limitations of HASS researchers by:

- providing simple information for industry on the possibilities for three way collaborations with community groups and researchers
- organising and encouraging peak councils and representative groups to share experiences and build knowledge on commercialisation
- improving awareness and accessibility to organisations such as AdviceBank for help with business plans and IT issues

Appendix 1. Focus Group and Questionnaire discussion topics

Commercial experience

1. How much experience have you had in commercial activities related to your work? How many commercial arrangements have you entered into? How many different products are involved in these commercial arrangements?
2. Why did you become involved in commercial activities? How did you get started, and how difficult was it?
3. Describe the benefits that have flowed from your commercial activities.

Support and assistance

4. Who has helped to fund your commercial activities? Why did they get involved?
5. Has dealing with commercial partners encouraged (or forced) you to change your approach to your work/research? If so, how?
6. Did anyone provide advice or help with your commercialisation activities? If so, who and how helpful were they?
7. Have you received assistance from other people within your institution (e.g. university commercialisation groups) in encouraging/facilitating your commercial activities? If so, how useful was this assistance?

Government support

8. Did you get any funding or support from any Commonwealth or State government program/s? If so, please name the program/s and agency/s providing the support and describe the sort of assistance provided. How helpful was this sort of support? Would you suggest changes to the way such program/s operate? Or extensions to these programs to assist you in new ways?
9. If you haven't accessed any government programs, can you explain why?

Peer attitudes

10. What has been the attitude of your colleagues to your commercial activities?

Lessons learnt

11. What do you know now that you wish you had known before you started undertaking commercial activities?
12. What do you think could be done to improve the involvement of researchers in the Humanities, Arts or Social Sciences in commercial activities (i.e. barriers to be overcome and any other incentives)?

From science to growth

Scientific research can promote economic growth, but not the way the Government is doing it. ***Stephen Allott*** *explains the need for a 'People-Centric Approach' to bring university and business together.*

Gordon Brown is absolutely right to regard the relationship between scientific research and business as vital to our economic future. But using Britain's top research universities to catalyse economic development requires a subtlety and understanding that is not yet evident in the Government's approach. Worse than that, I am now convinced, after three and a half years of research and practical business experience, that we have made a potentially catastrophic error by focusing on ideas as the mechanism for creating wealth. It is people who create wealth, and in this article, I shall endeavour to explain where and why we went wrong, and what we need to do to get back on course. The stakes could not be higher: get it right, and we will lay the foundations for many decades of prosperity; get it wrong, and we will waste millions of taxpayers' money while slipping down the scale of global competitiveness.

There is nothing wrong with the Chancellor's intentions. Recognising that Britain has some of the world's brightest brains, particularly in information technology, Brown and his Treasury team are determined to harness this intellectual power to the advantage of the UK economy. As he put it in his pre-Budget report: "In the global economy, the UK's future prosperity will depend increasingly on the capacity to expand knowledge through science and translate it into innovative products and better services. Countries at the forefront of research and innovation will be best placed to move into high valued-added, technology-driven areas, which can provide new sources of growth."[1]

Hence the Government's decision to invest heavily in the three streams of higher education funding – teaching, research and the university/business interface. Although

[1] www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr04/prebud_pbr04_index.cfm

the £90m a year allocated to this Third Stream in 2005/6 is a relatively modest proportion of the total, it is essential to help realise the economic potential of our spending on university research and teaching.

The link between scientific research and economic growth is well established, and in academic terms, Britain is promisingly placed – much better placed, for instance, than France, where Jacques Chirac recently announced the formation of an agency for industrial innovation in the hope of sowing similar seeds of economic growth. The UK currently boasts eight of the world's top 50 universities, with scientific research a particular forte. Although we are only 1% of the world's population, we pump out 5% of the world's scientific research, and achieve 11% of all citations globally in scientific papers – a sure measure of influence, and more citations per pound of GDP than any other country.

The Government's starting-point, reasonably enough, is R&D. Britain's spending on R&D is currently well below the OECD average – at 1.9% of GDP comparing particularly badly with France, Germany and the US. Gordon Brown has therefore decided that "delivering the Government's overall ambition for wealth creation and productivity growth from innovation will require sustained business investment in R&D, and increased business engagement with the UK science base"[2]. To raise R&D spending so that by 2014 it will account for 2.5 per cent of GDP, he expects £5bn a year to be spent on corporate R&D and academic research.

In making the case for this kind of investment, the Treasury's Science and Innovation Report observed last July: "Studies show that R&D delivers benefits by allowing an economy to do two things:

- understand and appreciate the value of others' findings and results;
- and make new discoveries."[3]

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[2] ibid

[3] www.hm-treasury.gov.uk/spending_review/spend_sr04/associated_documents/spending_sr04_science.cfm

But which of these "two things" should we concentrate on? It seems clear from everything that the Government has done since that date that they believe the answer lies in making new discoveries in the hope of subsequently commercialising them. This is why the Higher Education Innovation Fund is to receive £90m in 2005/6 to stimulate enterprise from research, largely through university technology-transfer offices. These offices are supposed to license new discoveries to industry, and to encourage "spin-outs" from universities.

The Government – or the departmental heads who are driving current policy – clearly believe in what has become known as the "linear" model of commercialising scientific research. This envisages the university, which owns a discovery, copyrighting, patenting or otherwise claiming it as intellectual property, then commercialising it either by putting it into a company (a "spin-out"), licensing it to industry, or building a consultancy round it. Hence the role of technology-transfer offices – which might better be called idea-transfer offices – in licensing, issuing patents and registering intellectual property rights.

The problem is that most of the leading academic research that has been done in this area – including some of the Government's own – suggests that this entire approach is misconceived. Wealth is created not by the exploitation of intellectual property but through the actions of entrepreneurs. Businesses do not engage with universities primarily in order to license intellectual property, but to recruit people. From the university's point of view, licensing income net of costs is a trivial component of research income (for Harvard, it represents just 1.7% of research income; for MIT just 1.6%[4]). Indeed most US universities actually lose money on licensing activity. The most effective methods of technology transfer have nothing to do with licensing; they are publications and personal contacts between industrial R&D staff and university personnel. Finally, the impact of "spin-out" companies is negligible. A survey of 150 US universities[5] found that, on average, only two companies per university per year were formed in this way.

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[4] US Association of University Technology Managers 2002 Licensing Survey, and analysis by the author

[5] ibid

Professor Barry Bozeman, the leading US expert in technology transfer and public policy, observed in 2000 that there was "an emerging consensus that university and federal laboratory technology transfer have only modest potential for creating new jobs or businesses"[6].

As if this were not bad enough, a subsequent study commissioned by the UK's Consulate General in San Francisco reported not only that "technology-transfer offices do not cover their own costs" but also that "direct donations from businesses typically far exceeded licensing revenues"[7].

In a paper published in 2000, Thursby and Thursby found that from an industry point of view, the marketing efforts of technology-transfer offices were the least important source of university technologies[8].

It is quite astonishing, in the light of this evidence, that the Government continues to pour money into technology-transfer offices.

Yet that same UK government study from San Francisco also hinted at what might be the most productive way of bolstering the link between scientific research and business. "All interviewees agreed that the most effective form of technology transfer was the migration of highly skilled people from universities to business. The technical know-how that researchers carry with them can be significantly more valuable to businesses than the legal right to commercialise inventions."

In other words, it's not the ideas that constitute the mechanism for creating wealth, it's the people. This is what the Government has failed to grasp as it remains committed to what I call the "idea-centric" model.

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[6] *Technology transfer and public policy: a review of research and theory*, Research Policy 29 (2000) page 647.

[7] Key Lessons for Technology Transfer Offices: Viewpoints from Silicon Valley; a Note from the Science and Technology Section of the British Consulate-General of San Francisco.

[8] www.autm.net/pubs/journal/00/perspectives.pdf

The Lambert Review of Business-University Collaboration was set up by Gordon Brown in November 2002 specifically to discover how the long-term links between British business and universities could be strengthened to the benefit of the British economy. Lambert reported back in December 2003 and noted the view in business and universities that too many spin-outs were being created and that technology-transfer offices weren't making money[9]. He made many other useful observations. But his report did nothing to challenge the prevailing view that a successful strategy was all about putting enough money into R&D so that brilliant ideas could be developed, licensed and commercialised.

Let's go back for a moment to that Science and Innovation Report by the UK Treasury, which suggested that "R&D delivers benefits by allowing an economy to do two things:

- understand and appreciate the value of others' findings and results;
- and make new discoveries."

If we put the new discoveries on one side for the moment, and consider the Treasury's other benefit source, we begin to see how we could develop a different approach, based on ensuring, firstly, that businesses make contact with the people who can answer the questions they want answered, and secondly, that university graduates meet the people who can help them get the jobs they really want. This is the people-centric approach, and I am convinced it is where the Government should be concentrating its efforts.

To begin with, we need to find out where businesses get their ideas for new R&D projects. Fortunately, Cohen, Nelson and Walsh asked precisely this question in 2002 as part of the Carnegie Mellon survey on Industrial R&D. Their survey, Links and Impacts[10], looked at the contributions of university and government research labs – "what we call public research" – to industrial innovation. This showed that customers were the best source of ideas for business projects (named by 90% of respondents), with the next-best source being manufacturing operations (74%). Research comes way down the list, named by just 32% of respondents – it was actually the second-worst source. In other

[9] www.hm-treasury.gov.uk/media/EA556/lambert_review_final_450.pdf

[10] Links and Impacts: The Influence of Public Research on Industrial R&D, Management Sciecne 2002 (48) pp 1-23.

words, the best business ideas don't come from the lab, but from business and the market. Where the scientists come in is in identifying the technology capable of meeting the customer need.

The people-centric approach takes its inspiration from business, from customers and the manufacturing process. It then uses PhDs to look things up, drawing on any and all of the world's scientific research. And the research is only accessed when needed, when the market is ready. By contrast, the idea-centric approach relies on ideas that emerge from the laboratory, where PhDs are studying whatever happen to be their chosen areas of interest. We are dealing with only British science, because that's where the idea has to come from – and that's only 11% of the scientific knowledge in the world. The idea emerges whenever the academic discovers it – typically after three years of research – regardless of the market's readiness, or business's willingness to commercialise it.

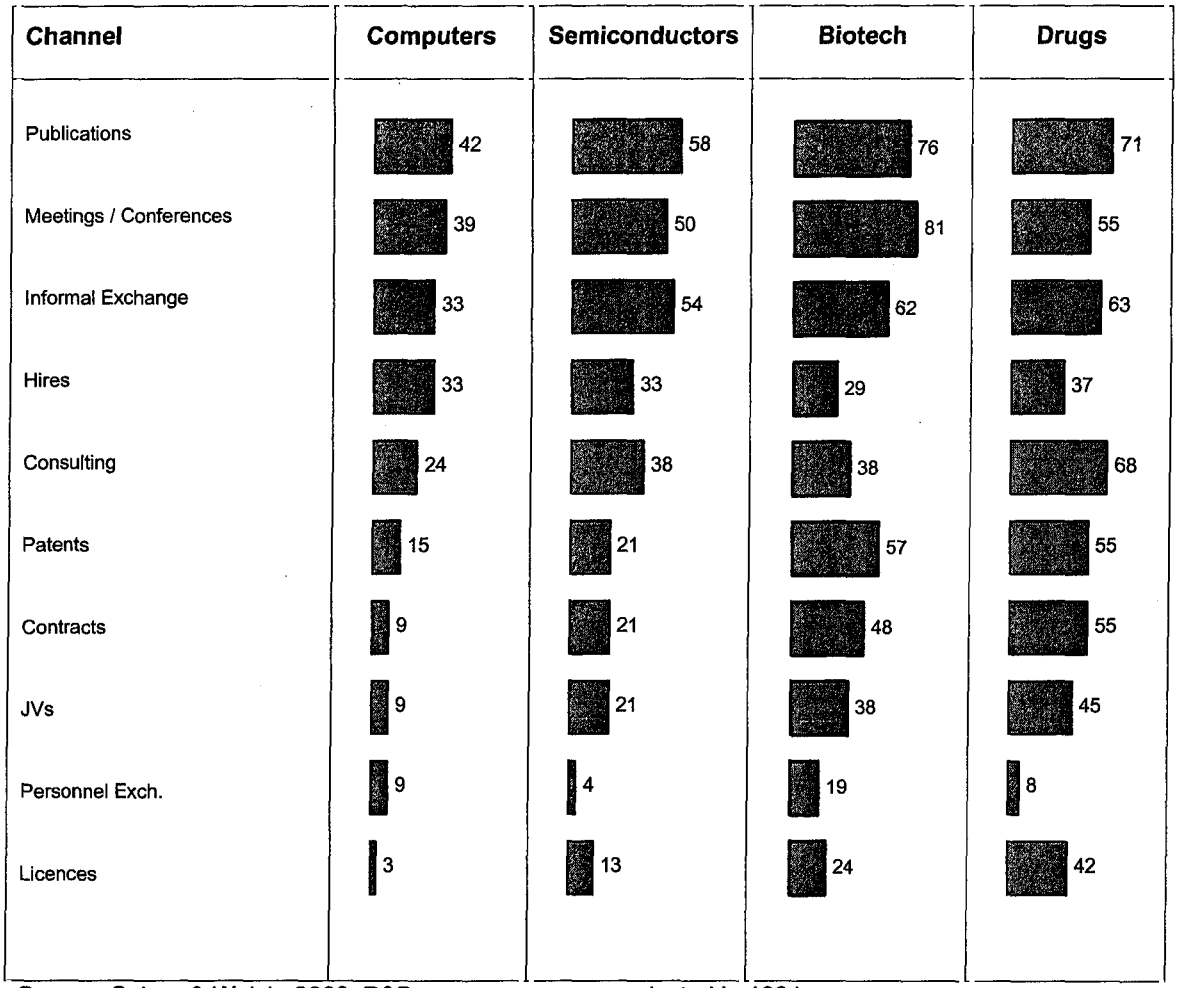
So here is a simple table that shows why the people-centric approach works and the idea-centric approach doesn't:

	People-centric	Idea-centric
Source of business ideas	Customers and manufacturing	Research (the lab)
Role of PhD	Looking things up	Inventing things
Amount of global science accessed	100%	11%
Timing of application of science	When needed	When invented

It's not that the idea-centric model never works, it's just that outside the pharmaceutical or biotech industries, the odds are stacked against it. The following table shows the results of a separate study by Cohen & Walsh in 1994, when they asked industrial R&D managers what channels they used to access the public research they needed:

How industry actually accesses research

Percentage of respondents indicating channel 'moderately' or 'very' important



Source: Cohen & Walsh, 2000. R&D manager survey conducted in 1994.

Not surprisingly, publications, conferences, meetings – the traditional forums for the dissemination of academic findings – are cited by respondents from all sectors as being the most important channels. But you will notice that whereas patents are the fourth most important channel for the biotech and drugs industries, they are comparatively insignificant in the world of computer science and semi-conductors. Similarly, contracts,

joint ventures and licensing are important channels for the biotech and drugs industries but insignificant in computing.

This table deliberately selects only four industries for the sake of clear comparisons. What it does not show is Cohen & Walsh's conclusion that it is the drugs and biotech industries that are the exception. The linear model of innovation, unusually, does work in this industry, where great advances in medical or industrial science may indeed emerge from the labs. Computer science and semi-conductors, by contrast, follow the general rule. This consists of ideas originating mainly from customers. Companies then commission the PhDs employed in their R&D departments to do the necessary research – in university libraries, among published papers, or by meeting people at conferences and symposiums.

It is odd, on the face of it, that the Government should have built its policy for commercialising scientific research on a technology-transfer model that only applies to one sector of industry. But I have a theory as to why the policy-makers have become attached to this model. Whether consciously or not, they have taken their inspiration from pharmaceuticals. Pharmaceuticals are a great British success story – we have the second largest drugs industry in the world behind the United States – and it's one area in which we spend disproportionately on R&D. Hence this observation from the DTI's science and innovation spending plans for the next 10 years[11]: "There have been fewer studies of individual industries but those of the pharmaceuticals industry highlight the importance of public investment in science, with one study recording a 30 per cent return."

So if the Government is putting its money into the wrong areas, pursuing an idea-centric model that doesn't really work, where should the money be going?

There is nothing wrong with the idea of trying to grow hi-tech business "clusters" out of universities, much as Sun Microsystems emerged from Palo Alto, California, with the eponymous acronym standing for Stanford University Network. More recently, we have

[11] *Science & Innovation Investment Framework 2004 - 2014.* DTI, Crown Copyright, 2004

the example of Google, whose co-founder Sergey Brin is a Russian who went to Stanford to do a PhD. And there is no reason why the so-called "Silicon Fen" that has emerged around Cambridge shouldn't achieve something similar. Research universities like Cambridge are ideal places to start building economic development, but not by concentrating on the research.

The key is to concentrate on the people, beginning with entrepreneurs. This is hardly controversial. In Cambridge, we have the outstanding example of Hermann Hauser, an Austrian who came to Cambridge to do a PhD in Physics and went on to found the computer company Acorn, which begat ARM Holdings, both of which spawned other companies. In all, Hauser has been responsible for the creation of more than 100 companies. The reason Acorn, ARM and the other companies got started was not because of any single research discovery but simply because Hermann Hauser came to Cambridge.

The idea that research universities should attract and educate the next generation of entrepreneurial leaders is not original. Professor Dan Roos of the Massachusetts Institute of Technology made the point in 2003 in his submission to the House of Lords Select Committee on the European Union. He cited an internal study which found that 20% of MIT graduates went on to found at least one company[12].

A paper by Myint, Vyakaram and New of Cambridge's Judge Institute of Management has since identified a "mini-cluster" of Cambridge entrepreneurs as "the key influence on success of the cluster growth process"[13]. Meanwhile, the Global Entrepreneurship Monitor run by London Business School has found that high-potential entrepreneurs thrive in economies with strong academic science bases. But the potential of those entrepreneurs is only weakly linked to the measurable quality of the scientific research. Something more subtle is at work, it would seem.

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[12] Written evidence of Prof. Roos, MIT at www.publications.parliament.uk/pa/ld200203/ldselect/ldeucom/142/3050602.htm; para 2.

[13] The Role of Serial Entrepreneurs in the Cambridge High-Technology Cluster: The Effect of Social Capital in New Venture Creation and the Cluster Growth Process.

From 2001 to 2004 I was a full-time industrial Visitor in the Cambridge University Computer Laboratory, and my experiences have convinced me that we could easily do more to attract, retain and develop entrepreneurs. One way would be to offer scholarships or otherwise select a small number of graduate students on grounds of demonstrable entrepreneurial ability rather than mere academic accomplishment. Another would be to incorporate more training in entrepreneurship into computer science and other suitable degree subjects. Yet another – and perhaps the easiest to introduce – would be to offer bursaries to encourage would-be entrepreneurs to stay in the area after graduation, thereby giving them a chance to find work or start a business. At the very least, Cambridge and other universities should raise their game on the marketing side, reminding entrepreneurs of the advantages of working in or near a university campus – such as the availability of a skilled and qualified local workforce as well as a congenial environment. Fledgling companies in particular need fledgling employees – cheap labour with real intellectual potential. And the relationship is mutually beneficial, with the local population enjoying better employment prospects and quality of life.

This leads us to the second group of people we need to attract to university towns: a technical and managerial labour pool. What entrepreneurs and business leaders want above all is to be able to hire the right people. In the world of computer science, technology professionals are the hottest properties, and places like Cambridge have lots of them. If you want these people to grow the kind of technology cluster that might really boost the economy, and not drift off and get jobs elsewhere, you need to introduce them to entrepreneurs, help them get their first jobs, and hope that they spread the word among their peers, forming in due course a permanent link between business and the university's computer science department.

There are various ways of doing this, of which perhaps the most powerful is the creation of "industrial supporters' clubs", whereby companies pay a subscription in return for the right to come and recruit from each year's crop of students. In Cambridge, this has worked best when we have invited every corporate member to deliver a three-minute

pitch to a hall full of computer-science students. We also invite them to exhibit at a jobs fair. This kind of event encourages the kind of informal exchanges that Cohen & Walsh found was the third most important channel for university/business links in computer science. Industrial supporters' clubs encourage students to make more use of the careers service and take up summer placements in industry – placements that often lead to permanent jobs. They also stand a chance of attracting newly-graduated MBAs from local business schools. Last but by no means least, they actually make substantial amounts of money for the university department concerned.

Their success would come as no surprise to Barry Bozeman, who wrote in his 2000 review of technology transfer and public policy:

"The most obvious advantage of universities over federal laboratories is a vitally important one – students. The presence of students makes a remarkable difference in the ouput, culture and utility of research. ...students are a means of technology transfer (through post-graduate job placements) and they often provide enduring links as the social glue holding together many faculty scientists and the companies they work with. Roessner et al. (1998) found that the single most important benefit to industry from participation in the NSF Engineering Research Centers, according to the industrial participants themselves, is the ability to hire ERC students and graduates.[14]"

Regional development agencies have a supporting role to play in attracting technology professionals – including well-qualified immigrants – to move into the area, along with all the sales, marketing and HR people who help to make a business run. The likes of Cambridge, or Oxford, or several other leading university towns, have great natural advantages with historic city centres, theatres, concert halls, restaurants and all the trappings of civilisation necessary to attract people. It's not hard to do, or costly. What it does require is energy and commitment – and it would be a big help to have a Government prepared to invest in the people-centric model instead of wasting money on technology-transfer offices.

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[14] ibid

The final ingredient in the people-centric alternative is the use of PhDs. This is the last area – as crucial as any – in which the Government's emphasis has been misguided. PhD students represent perhaps the most important single bridge between academia and business. According to the idea-centric model that expects research to lead to new discoveries, the job of PhDs is to make those discoveries. The truth is that the most valuable work PhDs can perform is to look things up. It sounds simple, but of course it isn't. The reason PhDs are uniquely valuable is that their knowledge and experience enables them to know where to look, what to look for, and how to test their findings.

The emphasis, therefore, should be on expanding the number of PhD students, and helping them to find employment in industry by using industrial supporters' clubs. In Cambridge, we run the Industrial Supporters' Club in tandem with a graduate association called the Cambridge Computer Lab Ring. The Ring does three things: it helps people make better career choices; it helps graduates who start companies to recruit staff, find customers, engage suppliers and get advice; and it keeps graduates in touch with the lab.

The crucial point is that all this activity is not just about creating networks for the exchange of ideas but actually helping computer science graduates to find the jobs for which they are best suited, while also helping companies to recruit the people they want.

This is qualitatively different from the long-standing policy which sought to build the business/university interface through collaborative research. This model of collaboration typically involves industry sponsoring academics to sit in university laboratories with only occasional visits from corporate representatives far from the real centre of decision-making; or it sees company staff becoming embedded in labs so far from corporate HQ that they lose sight of the business's strategy and "go native". I have personal experience of this kind of collaboration, and although it doesn't do any harm, it doesn't make any real contribution to the economy.

The Government has got one important thing right: research universities can indeed grow technology clusters and catalyse economic growth. Scientific research is the key to our economic future. Thereafter, the Treasury and DTI have comprehensively lost their way. As I hope I have demonstrated, the way to build technology clusters is not to rely on the licensing or patenting of brilliant ideas and discoveries that emanate from the laboratory, but to enhance the flow of people – entrepreneurs, technology professionals and PhDs – from university to business and vice versa.

In Cambridge, we're doing this without Government support. How much more might we and other research universities achieve if the Government would only put all this money into genuinely productive areas?

Over the coming months, the Higher Education Innovation Fund has an opportunity to get Third Stream funding onto the right track. Unfortunately, HEIF's current brief is to ask universities how they can make technology-transfer offices work better. This is the wrong question and the wrong mechanism to concentrate on – as I hope I have demonstrated. What they ought to be asking universities is what they can do to help catalyse economic development. Then they might get to hear about the mechanisms that really work, about industrial supporters' clubs, bursaries for entrepreneurs, graduate associations, summer placements and some of the people-centric ways in which Britain's top universities could indeed help to build the country's economic future.

16 February 2005