

THE COUNCIL FOR INDUSTRY AND HIGHER EDUCATION

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Extract from the
NOTE OF THE
44th MEETING OF THE COUNCIL
on the theme of
Entrepreneurship

5th October 2005 at Shell International Ltd

Those Present:

Chairman: Mr Richard Greenhalgh **Host:** Mr James Smith, Chairman, Shell UK

Guests: Mr John Kingman, Head of Finance and Industry, HM Treasury
Professor Bill Lucas, Joint Director, Cambridge MIT
Sir Keith O'Nions, Director general of the Research Councils and Head of OST
Mr Andy Powell, Chief Executive, EDGE

Members and Associates

Sir Michael Bichard	<i>Rector, University of the Arts London</i>
Professor Drummond Bone	<i>President, Universities UK</i>
Ms May Chien Busch	<i>Managing Director, Morgan Stanley & Co. International</i>
Mr Dominic Casserley	<i>Head, UK and Middle East, McKinsey & Company</i>
Professor Antony Chapman	<i>Vice Chancellor & Principal, University of Wales Institute</i>
Dr Geoffrey Copland	<i>Vice Chancellor & Rector, University of Westminster</i>
Professor Brenda Gourley	<i>Vice Chancellor, The Open University</i>
Ms Sarah E Jones	<i>Chief Executive, UFI Ltd</i>
Dr Geraldine Kenney-Wallace	<i>Director Group e-Strategy Learning & IT, City & Guilds</i>
Sir Tom McKillop	<i>Chief Executive, AstraZeneca plc</i>
Mr Peter Mather	<i>UK Head of Country, BP International plc</i>
Professor David Melville CBE	<i>Vice Chancellor, University of Kent at Canterbury</i>
Dame Yvonne Moores DBE	<i>Chair of Council, University of Southampton</i>
Professor Steven Schwartz	<i>Vice Chancellor & Principal, Brunel University</i>
Professor Peter Scott	<i>Vice Chancellor, Kingston University</i>
Professor Eric Thomas	<i>Vice Chancellor, University of Bristol</i>
Mr Russell King	<i>Executive Vice-President, (Group Human Resources and Business Development), Anglo American plc</i>
Professor Dianne Willcocks	<i>Principal, York St John College</i>
Sir Howard Newby KB CBE	<i>Chief Executive, HEFCE</i>
Mr David Young	<i>Chairman, HEFCE</i>

Executive

Mr Richard Brown	<i>Chief Executive</i>
Ms Barbara Blake	<i>Company Secretary/Director of Programmes</i>
Mr Ben Jones	<i>Personal Assistant</i>

Agenda item 4 : Enterprise and Entrepreneurship

The Chairman noted the paper that the CEO had earlier distributed (*Annex 1*) and welcomed Bill Lucas the Deputy Director of the Cambridge Massachusetts Institute (CMI) and invited him to speak to the slides he had distributed – see *Annex 2*.

Bill Lucas noted the results of research conducted with students from both MIT and 5 UK universities. This noted that the intent of students to start a company reduced as a result of their experience of higher education. However, MIT alumni surveyed later showed that some 30% had started at least one company by the year 2000. This accounts for why there are some 8,000 companies started by MIT graduates with a turnover of over \$225 billion. Yet MIT had not taught entrepreneurship as a subject to the oldest of those alumni. Other research noted that the average age at which alumni started their businesses was 35. He also noted that the same age group were often the innovators within large companies.

He suggested that an answer lay in the development of “self-efficacy” in students; a confidence in one’s ability to carry out specific tasks which provided a foundation for later entrepreneurial activity. This may not necessarily involve the starting of a new company. He suggested a key predictor of self-efficacy in the UK are:

- an industry placement having a close relationship to the course of study;
- with a relationship (mentoring or observation) with someone who was successful and could act as a role model;
- lecturers making the curriculum come alive through linking learning to business realities.

He concluded that some key lessons were that:

- SET disciplines can be taught in ways that build a foundation for innovative careers;
- placements and practice should wherever possible model the authenticity of businesses;
- business can help the process by offering more quality and relevant placements;
- mid career links between universities and alumni were important given the average age at which they were likely to start a business;
- the entrepreneurs that will lead wealth generating innovation in 2010-2020 are already in the workplace.

Sir Tom McKillop agreed that entrepreneurship could probably not be taught but that it was possible to engender both a more positive attitude towards business in general and start-up activity in particular. He suggested that it was important to change the culture of universities towards business, to reduce the aversion to risk across the whole community, to recognise and applaud success more and punish failure less and to both work to reduce the failure rate of business start-ups and help more to grow to be major businesses. There were too many barriers to growth and too little appetite to bring this about on the part of small business owners.

Dominic Casserley noted that his business and the major clients they served looked for graduates who offered new ideas, were self starters and who had a “get up and go” quality. Schools and Universities offered a very structured environment and therefore it was important for students to engage in extra-curricula activities. Business recruiters often looked first at the foot of the CV to see what activities the person had undertaken and this message needed to be conveyed to students. He agreed that businesses could do more to offer relevant quality placements and wondered how more information on this might be made available to help guide students.

Michael Bichard considered that it should be the aim of a university to incorporate the development of entrepreneurial skills in the curriculum, to make a range of specific programmes available, to make the university itself a more enterprising place and then to support the graduates once they had left. He agreed on the importance of cultural change across universities and suggested that this might involve (as at his institution) staff development and especially of the top team (including through NED experience), helping staff to think more commercially in all their activities, celebrating more the achievements of the creative industries, building professional networks with entrepreneurial companies, offering more relevant placements to students and establishing an on-campus venture capital capability.

In the ensuing discussion the following points were made:

Students appeared to be increasingly positive and enterprising. They were demanding entrepreneurship courses including outside the curriculum. Ultimately universities would change because their customers demanded this. Equally it was suggested that academics should not try and be businesspeople; universities should be business like but not necessarily businesses.

The role of distance learning in supporting the development of entrepreneurship needed to be better researched. Equally the reason why some projects seemed not to develop entrepreneurship (as noted by Bill Lucas) needed to be better understood. International partnerships and networks helped to widen the exposure of institutions and raise their awareness. The Research Councils might do more to encourage entrepreneurial outcomes and a more enterprising approach. Having on-campus links to venture capitalists was important in identifying opportunities and exposing students and staff to real entrepreneurial situations and to risk was important in conditioning their development. But we should not just emphasise the profit motive and forget the role of social entrepreneurship in adding value to society. The UK needed to develop a broader basis of visible consent towards enterprise and entrepreneurship.

From a business perspective there were seen to be links between life and leadership skills. Confidence arose from having done things and this self-image was all-important. But the doing had to be constrained as otherwise businesses and universities would be encouraging excessive maverick behaviour; getting the appropriate balance between entrepreneurship, team-working and business culture was not easy. Encouraging staff to develop a range of experiences through work in not-for-profit organisations as well as through e-learning in the evenings should be on offer as part of staff development in all businesses. Too often the enterprising and entrepreneurial activities took place in a world seemingly divorced from the work environment.

The Treasury agreed that cultural issues were important and conditioned the environment within which entrepreneurship could thrive. The role of the Government was to ensure a supply of an appropriate range of financial, tax and non-tax options, to minimise the regulatory burden and to improve the engendering of an enterprising and wealth creating approach across the education system. The picture in education was changing fast but the role of universities needed to be clarified. A welcome could therefore be offered to the new research project the CIHE would be undertaking with the National Council for Graduate Entrepreneurship, Enterprise Insight and other partners including from overseas to identify a range of good practice and to draw generic lessons for the sector and the Government.

Sir Keith O'Nions concluded the discussion by noting that there were limits to what formal education could do. He noted the importance of exposing students of all ages to entrepreneurial behaviour, to creating the space both inside and especially outside the curriculum for individuals to develop their own capabilities. He noted the role of the Higher Education Innovation Fund (HEIF) in facilitating university activity in this area and returned to the challenge thrown down by Bill Lucas as to what is the role of universities in helping the 20+ year olds who will be the entrepreneurs of the next decade to both establish new innovative organisations and help them grow to be major contributors to the UK.

The CEO noted the involvement of the CIHE in a project to identify the role of higher education institutions in helping those in the creative industries successfully bring their ideas to market and the new project to identify the features that dispose individuals to be entrepreneurial and then successfully realise that intent. He noted that the latter project would be led by the National Council for Graduates Entrepreneurship (NCGE) and commence early in 2006 once consultants had been appointed. It would aim to report on international good practice in the late summer of 2006.

Enterprise and Entrepreneurship What do businesses want? What can Universities provide?

Background

".. the entrepreneur and his function are not difficult to conceptualize: the defining characteristic is simply the doing of new things or the doing of things that are already being done in a new way (innovation)."

(Joseph Schumpeter, The Journal of Economic History, November 1947)

"The business enterprise has two and only two basic functions: marketing and innovation. Marketing and innovation produce results; all the rest are costs." (Peter Drucker, The Practice of Management)

Businesses have continuously to innovate (exploit new ideas) to stay competitive. DTI surveys have shown that those UK based companies that have invested heavily in R&D compete successfully in the global market place and have grown faster than the economy as a whole. Those that invest in their staff also grow. These businesses need ready access to world-class ideas and to enterprising people who are able to appreciate, seize and even create opportunities. Research has suggested that the qualities that make a successful entrepreneur are those that also make a successful "intrapreneur" – someone who can transform an organisation from within.

The Government's Position

The Government's position was first clearly set out in the 1998 Competitiveness White Paper "*Building the Knowledge Driven Economy*". This noted that the future prosperity of the UK relies on an economy that has high value-added and where enterprise, innovation and creativity is valued and supported. Higher Education was rightly seen as having a central role to play in building the knowledge driven economy:

"The most dynamic economies have strong universities, which have creative partnerships with business" (2 .4).

The development of a more entrepreneurial culture was seen as central to this vision. In 2003 the DTI issued an Innovation Report in which Lord Sainsbury says:

"We should be a country to which talented entrepreneurs and world-class companies come from around the world to do research and set up high-tech companies, attracted by the quality of our research, by the strong links between universities, research institutes and business, by geographic clusters of high-tech companies, by their ability to raise finance and by our quality of life."

The UK also needs to encourage enterprising individuals to innovate both within businesses and by starting their own successful growth companies.

The Government has been:

- within Government: encouraging changes to the bankruptcy/insolvency laws, a less risk averse culture across the public sector and co-financed projects;

- within the financial services sector: facilitating the development of public/private partnership models to provide appropriate risk finance/venture capital for smaller companies including start-ups;
- within education: introducing changes to the school's curriculum to raise awareness on entrepreneurship and business issues; on the higher education front, encouraging knowledge transfer and enterprise including through the establishment of the National Council for Graduate Entrepreneurship.

Research Findings

Research had noted that whereas in the USA some 8% of the population is involved in starting a business, in the UK the figure is 3% (in Japan it is 1.5%). Research by Allan Gibb (Durham University Business School) has suggested that 15% of the population has a propensity to be self-employed while many more will be self-employed at some stage during their working life. Currently some 13% of the population is self-employed. Providing relevant information, guidance and support for self-employment should therefore be high on the education agenda.

Recent research from the Cambridge MIT Institute (C-MIT) suggests:

- students surveyed after a year at both MIT and four UK universities say they are less likely to think about establishing a business than when they arrived; this is especially true of women students in the UK;
- universities can, however, help students become entrepreneurs if their awareness of business realities and their confidence to face business issues have been increased.

The research has suggested that enterprising and in particular entrepreneurial graduates are likely to have:

- a deep conceptual understanding of their chosen subject – particularly true of Cambridge students;
- strong personal and interpersonal skills, including through team working – a particular strength of MIT students;
- strong self-efficacy and confidence especially through having had exposure to real business issues – not a strength of either MIT or Cambridge.

So a tendency to be entrepreneurial can be assisted by:

- the depth of the curriculum;
- a curriculum that incorporates project solving in teams – especially perhaps if the problems are real business problems and businesspeople can facilitate the discussions and analysis;
- summer work - and in fast moving small companies in particular - and especially if learning aims have been set, the experiences have been reflected on and the lessons can be articulated (evidence of their having been truly assimilated and hence replicable);
- informal support via a relationship with a supervisor while undertaking that work placement;
- participation in a course on entrepreneurship – such as that run by the C-MIT – that can demystify the issues and develop confidence; this can then be called on in later life when the intent to establish a business comes to be realised.

This might suggest that:

- the worlds of academia and business need to be more permeable;
- the curriculum might be better informed and reflect current business issues and concerns;

- more managers might help deliver business case studies and simulations and move into senior academic posts;
- more academics might have spells in business;
- young graduates - especially those who have established their own companies - should be encouraged to 'tell it how it really is' to students;
- there might be more extra-curricula sessions on starting a business, developing a business plan, raising capital, minimising risk, exit strategies etc.

Further advice is needed for those who start a business so the high failure rate can be reduced. Some 45% of new companies fail by the end of three years. Since the banks generally only made money from such companies in year three, they have an especially strong business incentive to improve company survival and growth rates. The experience of organisations such as the Small Business Administration in the USA is that guidance and support in the six months immediately prior to a business start-up and the 18 months immediately after that is vital. Support comes from a pool of senior management talent, from Business Angels and from younger entrepreneurs.

Mentoring can help. The Princes Youth Business Trusts 8,000 volunteers operating from 50 offices provide personal mentoring for three years and average seed capital of about £2,000. Some 40,000 18-30 year olds had been assisted over 12 years. The importance of personal mentoring was shown by the fact that some 60% of businesses started with such support were still trading after three years with a further 20% of individuals getting a job and viewing their self-employment as a positive experience.

Clustering can encourage an enterprising culture and the sharing of experiences. The UK needs more Cambridge-style clusters. The following success factors have been suggested as being behind the growth of start-up companies in Silicon Valley:

- demanding large companies pulling through smaller companies in their wake;
- a pool of competent managers (related to the point above);
- elite universities with ideas and an application as well as blue skies research capability;
- an infrastructure of truly professional high debt knowledgeable advisers including in the financial services industry;
- the availability of capital-though this was never a problem where there was a worthwhile project.

The UK has many of these latent strengths (notably via our universities and strong financial services industry). However, there are problems in realising and in packaging these strengths;

- demanding large companies have not been so focused on building strategic relationships with their supply chains;
- they have been less linked to universities (true around even a university such as Cambridge until the attraction of units from e.g. Microsoft, BP and Unilever);
- our financial services sector has less technical capabilities to evaluate opportunities and our venture capital industry had focused on lower risk MBOs.

Thus Silicon Valley, at around three times the size of the greater Cambridge area, has some 30 times the number of start-up companies. Some of these have grown to be major multinationals. Whereas there are around 1,200 recently started companies in the greater Cambridge area (a greater cluster than anywhere else in the EU), virtually none has grown to above 200 employees. The C-MIT is looking at what factors can help businesses to break through this size constraint and it may be that joint ventures and marketing relationships with major international players are needed to help young entrepreneurial companies grow to be world players.

Even so, we should not assume that small companies will necessarily be the major engine for growth in a knowledge age. Many major world beating innovations come from multidisciplinary research teams in major corporations. The notion of the lone inventor is largely a myth.

The Government can act as an important catalyst but its resources must not be wasted by uncoordinated agencies offering inappropriate services. A focus on developing clusters of growth businesses with the RDAs and the Sector Skills Councils working with universities would mirror approaches in the USA. But many RDAs currently lack the capability to play a strategic role. A culture of entrepreneurship and risk taking within the public sector is also needed along with reductions in bureaucratic interventions, controls and reports from organisations such as the NAO which criticise from the benefit of hindsight those who have been entrepreneurial.

Some Encouraging Developments

There are some encouraging developments:

- young people appear keener on owning and developing their own businesses than ever before; however, the research also suggests that only 34% of 14-19 year olds have a positive impression of business (Businessdynamics research);
- the venture capital industry is more developed than in the rest of Europe and is prepared to invest more in start-up ventures (though the £50-500K funding gap remains for high-tech ventures in particular a problem).
- while the fear of the unknown and the fear of failure affect individual risk taking, there are ways of minimising risk and exposure (e.g. limited liability status) and a great deal of knowledge and experience on critical success factors exist.
- there are examples of small companies becoming major players (Dyson, Stage Coach, Arm and Psion) and many smaller company role models exist for aspiring entrepreneurs;
- within higher education the pace of change is accelerating and there is a willingness to embrace the competitiveness agenda, work readiness and the development of employability in students; there are courses in entrepreneurship and expanding relationships with local businesses and business organisations.
- work experience in its various forms is prevalent amongst students and the learning value from such experiences will be better captured in personal progress files and the Europass.

Various agencies and banks are running courses for prospective entrepreneurs and much more can be done on-campus, even if not as a formal part of the curriculum. A drawing together of the experience accumulated through the banks, Government agencies - including the Small Business Service - and higher/further education institutions would help.

CIHE Projects

The CIHE is involved with a range of partners in a project that is assessing how the curriculum can help those students studying the so-called creative industries (art, fashion, design, music, software, digital media etc) develop successful businesses. The significance of these sectors is being stressed (it contributes some £54.8 billion a year to GDP – against eg. £50.2 billion for construction), a range of good practice identified and proposals made for evolving and augmenting the curriculum and other aspects of the student experience such as support networks for enterprising students and graduates.

The CEO has been a member of a Commission established by the British Venture Capital Association to review where the BVCA might add value to existing initiatives across the whole of the education sector. A report has been finalised that usefully summarises current activities and offers modest suggestions as to where the BVCA might augment these. The report will be released in October.

The CIHE, the National Council for Graduate Entrepreneurship (NCGE), Enterprise Insight, the Government's Small Business Service, and the Higher Education Academy will shortly launch an international project to identify success factors and generic lessons on how entrepreneurship is developed by higher education institutions. The project will involve organisations in the USA and the Far East.

Some Issues for Discussion

What do we mean by Entrepreneurship? Do we mean the practice of embarking on some enterprise in one's own cause or the set of conditions and skills which predispose one to attempt and eventually to succeed at it? If the latter, do we know what these are and how higher education institutions can help develop them – or at least not undermine them?

How can businesses identify enterprising graduates? What is the relationship between clever and creative graduates?

What features of the curriculum or the wider experience of higher education dispose graduates to be more successful innovators? How can businesses and universities work closer to offer relevant experiences? Since graduates are evidently on average 35 years old when they establish a business, how can universities cater for the mature entrepreneur?

What is the role of enterprising people within organisations? How can they be freed to innovate while not undermine the business (Enron was full of enterprising people!)?

Do the pressures of audits (financial, corporate social responsibility etc) engender risk aversion and constrain creativity in private businesses and universities?

Can universities be more creative in the way they are organised and deliver learning and research or would new structures threaten their brand image and global standing? Can university leaders deliver changes or are they captives to their structures and staff?

CIHE
September 2005



The
Cambridge-MIT
Institute

Annex 2

ENTREPRENEURSHIP: RESEARCH FROM CMIT

Dr. William A. Lucas, Deputy Director
Cambridge – MIT Institute

University and Industry Roles in Fostering Innovation

Lessons from four years of continuing CMI research

- (1) Research on MIT undergraduates and alumni seeking explanation for success
- (2) “Assessment” (or more accurately evaluation) research looking for underlying explanation for CMI programmes success or failure
- (3) Education and High Growth Innovation (EHGI) research stream involving 6 UK universities (N=2900)
 - > New sandwich year project with BP, BAE, GSK, JC Bamford and others just underway



A central CMI commitment was the transfer of important MIT practices to the UK, requiring a measure of intention to start companies.

Scale based on straightforward statements

“I will join a start-up company if the opportunity arises in the next few years.”

“The idea of high risk/high pay-off ventures appeals to me.”

“At least once I will have to take a chance and start my own company.”

“I often think about ideas and ways to start a business.”



Entrepreneurial Intent at Four UK Universities

With seven point agree/disagree scale

6.0 \approx “agree” to all four statements – “Intent”

2.0 \approx “disagree” to all four – “Rejecting”

	<u>Rejecting</u>	<u>Neutral</u>	<u>Intent</u>	<u>Average</u>
1 st Year	14.2%	72.5%	13.4%	} 10.9%
2 nd Year	8.9%	84.9%	11.8%	
3 rd Year	13.0%	77.9%	10.4%	
4 th Year	13.4%	81.4%	7.9%	

- Entrepreneurial intent is high for entering undergraduates, and declines
- University cultural influence, or reality pressing in?



With seven point agree/disagree scale

6.0 ≈ “agree” to all four statements – “Intent”

2.0 ≈ “disagree” to all four – “Rejecting”

	<u>Rejecting</u>	<u>Neutral</u>	<u>Intent</u>	<u>Average</u>
1 st Year	4.9%	87.0%	8.1%	} 7.2%
2 nd Year	8.9%	84.9%	6.2%	
3 rd Year	13.0%	77.9%	9.1%	
4 th Year	13.4%	81.4%	5.2%	

- A reality for US students in their fourth year is the added obligation to start repaying student loans.

MIT alumni surveyed in 2000:

“Have you founded your own company?”

	<u>Age</u>	<u>Yes, one</u>	<u>More than one</u>
Class of 1994	28	9%	3%
Class of 1989	33	12%	4%
Class of 1984	38	16%	4%
Class of 1979	43	22%	9%

- Consistent with 8000 companies started by MIT graduates
- Cannot be explained by levels of undergraduate intention
- Note that MIT did not teach entrepreneurship in 1979



Age of Entrepreneurs Leading MIT Spin-outs

Roberts (1991) studies found in Entrepreneurs in High
Technology, Oxford University Press, Oxford.

	<u>No.</u>	<u>Ages</u>	<u>Median</u>
<u>MIT Laboratory Spin-off Studies</u>			
Electronic Systems Laboratory	11	27-43	35
Instrumentation Laboratory	27	24-55	33
Lincoln Laboratory	47	25-65	34
Research Lab. for Electronics	13	29-64	36



Self-efficacy as Predictor of Innovative Capability

Explanation believed to be found in “self-efficacy”

Confidence in one’s ability to carry out specific tasks

- Known to persist over long periods of time
- When positive, self-efficacy leads one to stretch, to take on task of more difficulty
- Leading in a virtuous circle to further increases in self-efficacy in a domain
- Domain self-efficacy a prerequisite to entrepreneurship
 - Technology self-efficacy for high tech innovation
 - Venturing self-efficacy for new business within or outside the established firm



Venturing Self-efficacy as Confidence in One's Skill to:

- Pick the right marketing approach for the introduction of a new kind of service.
- Know the steps you would take to place a financial value on a new business venture.
- Estimate accurately the costs of running a new project or venture.
- Work with a supplier to get better prices that help a new venture become successful.
- Convince a customer to try a new product for the first time.
- Write a clear and complete business plan.

General venturing; not specific to start-up entrepreneurship



Industry-Related Predictors of Self-efficacy

UK 3rd and 4th year SET
students with work experience

Technical
self-efficacy

Venturing
self-efficacy

Industry placement with close
relationship to course of study

++

++

Observed someone that was
particularly effective & successful

+

+

Lecturers talked about jobs in
industry

+

++

Worked on project focused on real
industry problems

0

0

Met employees on company visits

0

+

Residual effect of third year

+

+



Lessons

- Science & engineering disciplines can be taught in ways that build a foundation for innovative careers.
- The role of the SET university should not center only on early entrepreneurship.
- Industry could enhance the innovative capabilities of young graduates with improved use of student placements.
- If the median age of wealth-generating entrepreneurs is roughly 35, most high technology entrepreneurs that will lead wealth-generating innovation in the UK in 2010 - 2020 are already in industry or university posts.
 - Perhaps more attention should be given to mid-career entrepreneurship.