# A review of enterprise in universities and maximizing its successful integration.

Dr Matthew Hocking, Enterprise Reader, Faculty of Computing Engineering and Science, Staffordshire University

## Introduction

Since the inception of the university system, there has been an awareness that leading edge thinking is of value to industry. In the 1930’s a close collaboration between state government and Stanford university turned a new state highway into the conurbation around MIT. Graduates of MIT were encouraged to create businesses of their own, which led not only to the first venture capital companies and then silicon valley, but global players such as Hewlett Packard. All this just after the second world war, in response to the loss of the US industrial base after the depression of the early 20th century.

A university is an institute of higher learning which undertakes both teaching and research.

The teaching of undergraduates to graduate level, followed by post-graduate and higher research that then feeds back into teaching is the life blood of such an institution. The university’s interaction with the outside world generates impact at many levels: the average level of national education; the wealth brought to a local area; and specifically relevant to this discussion - its relationship with external commercial organisations. This relationship in its many forms is what we will call enterprise.

**Why enterprise?**

What does enterprise mean to a university and why is it included in the strategy of a modern educational establishment? It is about the interfaces between the university and the private and public institutional environment. When a university undertakes work with external partners who are not its main (student) consumers, that is enterprise. So by its very existence, a university must ‘do’ enterprise.

How do we recognise or measure the success of enterprise? As the cycle of industrial growth wanes in the UK and Europe, it is inevitable that once more the focus on wealth generation should turn to renewal (Anonymous 2010). New industries, new ideas, new technologies are all likely outputs of an academic research environment. For over a dozen years, the requirement for enterprise has been a key driver for the modern university in the UK (Loder 1999). More than simply a requirement to teach enterprise or to show that technology push from research can create value, the focus is now on impact - the real world value that university led innovation generates. This has been recognised world wide and there are many strategies for growth of this symbiotic ‘triple helix’ of university, government and industry (Etzkowitz & Leydesdorff 1998)( Etzkowitz & Raymond 1996).

## How is enterprise conducted?

Within the UK there are several approaches to conducting enterprise, some are more integrated with teaching and learning than others.

Looking to the core of the student experience, it is important for employability that students “show initiative, solve problems, be creative and flexible” (Hansdcombe, Rodriguez-Falcon & Patterson 2008). For the good of the region and/or nation, staff members should be also encouraged to embrace commercial exploitation of the intellectual property (IP) that they create. Further integration of enterprise occurs when this circle is closed and the students instead of being taught, are exposed to the live enterprise going on through their teachers’ work.

These strategies are maturing as learning organisations - both universities and industry - put significant effort into building their relationships through open innovation partnerships and co-creation (Smith & Paton 2011). The effectiveness of a university’s approach to integrating enterprise could be illuminated by looking at what large commercial organisations are doing to create value from their own knowledge base (Prince & Allison 2003). The two scenarios are potentially the mirror image of each other.

The simplest form of external enterprise for a university is the conventional engagement of consultancy, knowledge transfer partnerships and technology push. Often the front-loaded funding does not depend on audited impact, only the application stage story to convince the funders of potential impact and likelihood of success. This method builds income, but without guaranteeing impact. The simplest form of integrating such enterprise is teaching students to behave ‘intrapreneurially’ (entrepreneurially but looking into their own workplace).

## Integrating enterprise - best practice

Enterprise in a university reduces to three types:

* integration of learning about enterprise into curriculum - business skills, intrapreneurialism
* integration of enterprise as value generation from existing staff
* indoctrination of entrepreneurial behaviour into students and staff through exposure to enterprise

The White Rose Centre for Enterprise in Sheffield University has embraced the holistic approach of teaching students “*about* enterprise … while equipping them *for* enterprise … [in] a learning environment *through* which they connect with real enterprise activity” (Handscombe, Rodriguez-Falcon & Patterson 2008 p. 265). This instance of intervention from the UK Science Enterprise Challenge has succeeded in bringing cultural change in favour of enterprise in the mechanical engineering departments, at least.

Smith & Paton (2011) have built a collaborative enterprise approach at Glasgow Caledonian University and the University of Glasgow. Incorporating an experiential knowledge acquisition learning approach creates multidisciplinary, multi-partner global enterprise programmes. Key to their success has been their “willingness to engage in multi-faceted partnership solutions and the ready availability of external funding and management commitment” (Smith & Paton 2011 p. 115). This has resonances of a locally scaled incarnation of the ‘triple helix’.

Programmes described by Rae (2007) at Lincoln and Derby and at Leeds Metropolitan and Nottingham Universities show that an integrated approach including self-awareness, opportunity awareness, decision making, and transition learning can be applied at all stages of work based learning and for training university enterprise staff.

Where many programmes incorporate an incubation or fast track for commercializing student generated IP, the Michigan Technology University runs a number of student companies on a rolling programme. Set up as real companies with real IP basis, students from a breadth of areas and levels of experience will work together in the company teams to gain enterprise experience (Stone et al. 2005).

Virtual environments can provide research with what-if platforms for modelling. Simultaneously, students can be immersed in working enterprise, albeit fictional, where their entrepreneurial behaviour can be monitored for success and failure without financial risk (Borgese 2011).

How do commercial learning organisations justify their business case for investment in teaching, learning and enterprise? Global organisations with significant know-how in their sector have always looked to maintain and build on that knowledge with, for example, McDonalds, Mini (BMW), HP, IBM and others having internal ‘universities’. Work around the partnerships for this knowledge maintenance can be an alternative to market leadership (Teague 2005). The market is ready to partner with best practice teaching and learning in universities if the offering can be designed around enterprise (Campbell & Dealtry 2003)(Prince & Allison 2003).

## One, some or all?

To fulfil any of the tasks required of a university, we must allocate resources. The different structures which grow inside an organization by allocating resources in a particular way make each organisation unique. In order to bring a new fusion of function by using existing resources, there must be changes to the existing structures, even if not the number or capabilities of those resources.

What holds back freedom and autonomy of those wishing to be entrepreneurial are the constraints which minimise enterprise risk in an organisation like a university, where due to funding constraints, output figures are more important than commercial agility (Bridgman 2007).

Should enterprise be based only on the student output and their innovative solutions? Success levels for spin-outs from universities would suggest not, since only one in thousands ever covers the inward investment.

Should enterprise only be conducted as a business development activity in which case who knows enough about the technical specialities to market them as commercial offerings? Might we let the technical managers manage and provide enough free reign to do investigative work with an enterprise support structure to enable them?

None of the models discussed so far solve all issues for all areas of enterprise function. There are pockets of success, but no ‘one size fits all’ solution. It is apparent that success is as dependent on the programme’s fit with the legacy processes of the university as with the aspirations of those driving its implementation.

## Conclusion

Enterprise already occurs. The employability agenda covers much of what is required by enterprise and entrepreneurship teaching. Further learning from problem based work can only be provided if more hands-on enterprise is being conducted by those who are providing the teaching and the research that feeds the teaching.

A common theme for success in integrating enterprise is a strong vision from a supportive legislative layer, combined with open frameworks for autonomous behaviour of the knowledge creators. This was true in the embryonic silicon valley and here, now. The truth is that no process of change has a 100% conversion rate, neither should it. Some operations do need change, but some which do not currently exist need design and implementation.

All we need is a framework which promotes and actively enables the internal / external relationships for commercial partnership to flourish. This is true in teaching and research. An inwardly reflective learning organisation should offer its best lessons to its own staff in order to maximize performance.

Whatever models are chosen for whatever strategic drives, success in enterprise can only emerge from a freedom to enterprise.

##

## References

### Journals

Anonymous. (Jul 15, 2010). Value-adding enterprise. *Nature*. 466 (7304) p. 296.

Arvanitis, S., Kubli, U. & Woerter, M. (2008). University-industry knowledge and technology transfer in Switzerland: What university scientists think about co-operation with private enterprises. *Research Policy.* 37 p.1866-1883.

Borgese, A. (2011). Virtual Enterprise: Transforming Entrepreneurship Education. *Journal of instructional pedadgogies.* 6 p. 1.

Bridge, S., Hegarty, C & Porter, S. (2010). Rediscovering enterprise: developing appropriate university entrepreneurship education. *Education + Training.* 52 (8/9) p.722-734.

Bridgman, T. (2007). Freedom and autonomy in the university enterprise. J*ournal of Organizational Change Management*. 20 (4) p.478 - 490.

Campbell, I. & Dealtry, R. (2003). The new generation of corporate universities - co-creating sustainable enterprise and business development solutions. *Journal of Workplace Learning*. 15 (7/8) p. 368-381.

Etzkowitz, H & Leydesdorff, L. (1998). The Endless Transition: A "Triple Helix" of University-Industry-Government Relations.*Minerva: A Review of Science, Learning & Policy; Fall1998*. 36 (3) p.203-208.

Etzkowitz, H & Raymond, SU. (1996). The triple helix: Academic-industry-government relations - Implications for the New York regional innovation environment. *TECHNOLOGY LINK TO ECONOMIC DEVELOPMENT: PAST LESSONS AND FUTURE IMPERATIVES* *Book Series: ANNALS OF THE NEW YORK ACADEMY OF SCIENCES* (787) p.67-86.

Etzkowitz, H. (1990). The capitalization of knowledge. *Theory and Society*. 19 p.107-121

Gärtner, C. (2011). Putting new wine into old bottles: Mindfulness as a micro-foundation of dynamic capabilities. *Management Decision*. 49 (2) p.253-269.

Handscombe, R.D., Rodriquez-Falcon, E, & Patterson, E.A. (2008). Embedding enterprise in engineering. *International Journal of Mechanical Engineering Education.* 37 (4) p.263-274.

Keogh, W & Galloway, L. (2004). Teaching enterprise in vocational disciplines: reflecting on positive experience. *Management Decision*. 42 (3/4) p.531-541.

Lategan, L. & Hooper, P. (2009). Ethics, governance, research and enterprise. *Perspectives: Policy and Practice in Higher Education.* 13 (2) p. 56-60.

Loder, N. (1999). UK universities look to enterprise. *Nature* 401 (6751) p.316.

Prince, C. & Allison, A. (2003). Corporate university developments in the UK SME sector. *Journal of Workplace Learning*. 15 (5) p.229-239.

Rae, D. (2007). Connecting enterprise and graduate employability - Challenges to the higher education culture and curriculum? *Education and Training.* 49 (8/9) p.605-619.

Smith, A.M.J. & Paton, R.A. (2011). Delivering enterprise - A collaborative international approach to the development, implementation and assessment of entrepreneurship. *International Journal of Entrepreneurial Behaviour & Research*. 17 (1) p.104-118.

Stone, D. et al. (2005). The Enterprise Program at Michigan Technological University. *Int. J. Engng Ed.* 21 (2) p. 212-221.

Teague, P. (2005). What is Enterprise Partnership? *Organization.* 12 (14) p.567-589.

Yolles, M. (2005). Organisational intelligence. *Journal of Workplace Learning*. 17 (1/2) p.99-114.

### Books

Cameron, E. & Green, M. (2009). *Making sense of change management.* 2nd ed. Kogan Page.

Fisher, K. (2000). *Leading self-directed work teams*. McGraw Hill.

McCaffery, P. (2010). *The higher education manager’s handbook*. 2nd ed. Routledge.