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#18 THE ENTREPRENEURIAL UNIVERSITY WAVE[1]

Henry Etzkowitz

Introduction

Entrepreneurship arose as part of a broad cultural and social transition, the break with tradition in all areas of human endeavor and the transition to modernity. The invention of new social and cultural formats, as well as new forms of business enterprise, may all be viewed through the lens of entrepreneurship. Rather than limited to the business realm, entrepreneurship can be identified in governmental, academic, and cultural spheres. For example, the formation of new artistic schools breaking with older forms of artistic vision, the invention of new hybrid art forms, breaking the boundaries between the visual and performing arts and the rise of performance spaces, questioning the received authority of concert halls, opera houses and other traditional performing arts venues exemplify the various forms of arts entrepreneurship. A similar efflorescence of entrepreneurship can be identified in other areas of human activity and among diverse populations.

Entrepreneurship, the ability to take the initiative to organize a new activity or enterprise, has been presumed to be a cultural and psychological characteristic, more closely connected to and likely to occur among particular ethnic and religious groups. Max Weber, one of the founders of modern sociology argued that a consequence of the rise of Protestantism as a religion not tied to a central authority was its encouragement of the development of capitalism.[2] Robert K Merton followed up with an analysis of the emergence of science in seventeenth century England linked to the decline of religious authority.[3] However, Werner Sombart argued that the Catholic merchants of Bruges were as entrepreneurial as their Protestant counterparts, vitiating the link of religion to entrepreneurial enthusiasm.[4] Nevertheless, the examination of technical entrepreneurship in the 1960's was strongly influenced by Max Weber's Protestant Ethic hypothesis. Ed Roberts and his students at MIT conducted empirical studies of the ethnic and religious background of individual entrepreneurs in order to discern differences in their achievement motivation, but the effort was eventually given up when no clear-cut evidence could be discerned.[5]

The contemporary analysis of entrepreneurship arose from the debate over the relationship between technological and organizational change, associated with the emergence of the modern corporation.

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[1] This piece draws upon The Anatomy of an Entrepreneurial University, Social Science Information, forthcoming.

[2] Merton, R. (1938) *Science, Technology and Society in Seventeenth Century* England Bruges: St. Catherines Press

[3] .Sombart, W. (2001) *Economic Life in the Modern Age.* Reiner Grundmann, ed. New Brunswick: Transaction Books.

[4] Roberts, E. (1991) *Entrepreneurs in High Technology: Lessons from MIT and Beyond* Oxford: Oxford University Press.

[5] Schumpeter, J. Economic theory and entrepreneurial history In Essays on Economic Topics Port Washington NY: Kennikat Press Essays ([1949] 1951:255).

The relative role of individual versus organizational initiative was assessed in this venue. The insight that individual entrepreneurs are typically part of a collectivity made groups and organizations the prototypical entrepreneurs. As Schumpeter pointed out, "... the entrepreneurial function need not be embodied in a physical person and in particular in a single physical person".[6] He identified the role of The US Department of Agriculture, in creating an agricultural innovation system from the late nineteenth century, as one such collective entrepreneur. Public entrepreneurship has since expanded to the Defense Department, and the National Science Foundation (NSF), among other agencies. The Defense Advanced Research Project Agency's (DARPA) role in creating the Internet and computer networking industries is well known;[7] the public venture capital role of the NSF in founding the Small Business Innovation Research Program (SBIR) is less well publicized.[8]

University entrepreneurship builds upon traditional academic tasks of teaching and research, even as it incorporates them into entrepreneurial practice.[9] Thus, entrepreneurship has become an academic teaching and research discipline as well as an academic practice. Individuals and groups are trained in entrepreneurship through university education and apprenticeship schemes.[10] Project Genesis at the Pontifical Catholic University of Rio de Janeiro, and the Masters Program in Entrepreneurship at Chalmers University in Sweden, have demonstrated that individuals of various cultural and social backgrounds, as well as groups, can successfully be trained as entrepreneurs.[11] The Swedish degree program accepts both individual and group candidates for its degree programs. Thus, whether persons grew up in the Swedish social welfare tradition, or in a Brazilian Catholic environment, a set of courses and practical applications can be organized that will set them on the path to firm formation. Entrepreneurship is thus integrated into the academic scene irrespective of whether or not there is an encouraging cultural environment. Indeed, it is often introduced into academia by policy measures to help create such an environment.

Stages and Phases of Academic Entrepreneurship E

There are three stages and phases to the development of the university as an entrepreneur, with each modality building upon the other, in a usual but by no means necessary order. In an initial phase (*University Entrepreneur One*) the academic institution takes a strategic view of its direction and gains some ability to set its own priorities, either by raising its own resources through donations, tuition fees, and grant income, or through negotiations with resource providers. This is the sense in which "entrepreneurial university is used by Burton Clark in his analysis of European universities extracting themselves from virtually total Ministry control down to the number of students that may be recruited in each discipline. European universities, that formerly received almost their entire income by government subvention, are undergoing the painful process of diversification, forming alumni associations to connect with their graduates and establishing fund raising offices, long a staple

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[6] Hafner, K and Lyon, M. (1996) *Where Wizards Stay Up Late: The Origins of the Internet*. New York: Simon and Schuster.

[7] Etzkowitz, H, Gulbrandsen, M and Levitt, J. (2000) *Public Venture Capital* New York, Harcourt.

[8] Etzkowitz, H. (1983) Entrepreneurial Scientists and Entrepreneurial Universities in American Academic Science, *Minerva* 21 (2-3): 1573-1871.

[9] Jones-Evans, D and Klofsten, M. (1997) Technology Innovation and Enterprise The European Experience Basingstoke: Palgrave Macmillan.

[10] Etzkowitz, H, Mello, J and Almeida, M. (2005) Towards 'meta-innovation' in Brazil: The evolution of the incubator and the emergence of a triple helix *Re- search Policy* 34 (4): 411-424.

[11] Clark, B. (1999) Creating Entrepreneurial Universities: Organizational Pathways of Transformation New York: Pergamon.

of US academia.[12]

In a second phase (*University Entrepreneur Two)* the academic institution takes an active role in commercializing the intellectual property arising from the activities of its faculty, staff, and students. In this phase, a university typically establishes its own technology transfer capabilities, in-sourcing them from firms to which they may have been contracted, such as the Research Corporation in the US, or through devolution of system-wide offices, as in the State University of New York and the University of California, to individual campuses. Universities with significant intellectual property potential, like Stanford, received an immediate boost in income from having their own staff in more direct contact with the faculty. Similarly, research powerhouses, like Oxford, Cambridge and Imperial, in the UK, very quickly became leaders in technology transfer and firm-formation once they turned their minds to it. Universities with fewer research resources to commercialize, not surprisingly, take a longer time to ramp up. However, some schools with modest resources, like Arizona State and the University of Utah, that have made tech transfer and firm formation an equal priority with education and research, have achieved higher rates of valorization than many of their resource rich competitors.

In a third phase (*University Entrepreneur Three*), the academic institution takes a proactive role in improving the efficacy of its regional innovation environment, often in collaboration with industry and government actors. Although these phases were identified as taking place sequentially in the development of the Massachusetts Institute of Technology (MIT), non-linear and even reverse sequences may be identified, for example, in the experience of the Blekinge Institute of Technology in Sweden which took off from phase three.[13] Regional government and business actors identified establishment of an academic institution as part of a strategy to make the transition from a declining industrial region to knowledge-based industry, in this case software. They successfully lobbied the national government and the Blekinge Institute of Technology was founded. Thus, the transition to the entrepreneurial university can take off from a teaching as well as a research-oriented school.

Academic Independence and Entrepreneurship

To be an entrepreneur, a university has to have a considerable degree of independence from the state and industry, but also a high degree of interaction with these institutional spheres. In academic systems following the Humboldtian model of close ties to the state, on the one hand, and professional autonomy guaranteed by civil service status, on the other, the university was an arm of the Ministry of Education with little ability to set its own strategic direction. The achievement of relative autonomy from the state, a process that was initiated in Europe relatively recently, occurred in the early nineteenth century in the US.

Academic independence from direct state control was secured in the US as an outcome of the Supreme Court decision in the Dartmouth College case of 1819. A schism at Dartmouth College left two groups struggling for control. One group reorganized as Dartmouth University, and tried to obtain control by having the state of New Hampshire revise the charter that had established the College. The representatives of the original College argued that the state could not revise a charter,

[12] The lack of experience with academic fund raising has opened up a market for consultants to role play asking for money with newly minted university fund raisers in the UK who are from a culture where such a question is considered to be impolite.
[13] Author interview with Per Eriksson, Rector of Blekinge Institute of Technology, Stockholm 2000.

once granted. In supporting this position the Court defined universities as "private eleemosynary institutions" stating that trustees and professors were not public officers nor were they extensions of "civil government".[14] The case had broader implications in the extension of its general principles of institutional autonomy from charitable to business corporations, becoming the legal basis for increasing independence of corporations from state control.

The ability to take independent initiatives is based on the premise that the university is not a subordinate element of a hierarchical administrative structure such as a Ministry of Higher Education. If a university system operates as it formerly did in Sweden where the Ministry of Higher Education decided how many students would be admitted each year to each discipline, there is hardly a possibility to have sufficient autonomy on which to base an entrepreneurial university. It has been argued that universities did not come into independent existence in France until the 1970's in a devolution that occurred as a side effect of reforms made in response to the student movements of the 1960's. Until quite recently, the various faculties were directly linked to the National Ministry and universities hardly an organizational framework, let alone autonomy. [15]

To this day European Professors are often selected through national competitions, that make a strategy such as Terman's "steeple building" at Stanford, creating a critical mass of professors on a special topic, difficult if not impossible to realize. Terman's strategy was to identify a nascent field with theoretical and practical potential and hire several professors with research specialties in this area, in effect forming a proto center, while linking them to departments in which they would teach more broadly than their special research area. This strategy allowed the university to fulfill three missions simultaneously that otherwise might have been at odds with each other.

Paradoxically, the increased independence of the university is based on its enhanced relevance to government and industry in the transition to a knowledge-based society . The university's ability to identify and protect its essential interests is enhanced under these conditions. The dominance of industry over university, feared in industrial society, is superseded in knowledge-based societies, as knowledge embedded in intellectual property gives its holder significant bargaining power in setting the terms of its utilization. The question of who influences whom in university-industry interactions is always an empirical one, with the answer weighted towards the actor with the most highly valued good under varying societal conditions. A better understanding of an expanded role of the university in economic development can change fear into interest and lead to more support for the academic enterprise, not only from the general public and traditional government funding agencies, but also from other sources such as regional development authorities, ministries of enterprise and industry, regional, national and multi-national funding agencies, etc.

As universities become entrepreneurial, tension emerges between this new role and that of teaching and research; just as there has been tension between research and teaching. As the university crosses traditional boundaries through linkages to industry, it must devise formats to make its multiple purposes compatible with each other. So far the university has been an ingenious innovator: mixing disciplinary departments with interdisciplinary centers; encompassing critical disciplines such as

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[14] Chief Justice John Marshall's Opinion in the Dartmouth College Case, 1819 In. Hofstadter, R and Walter Metzger (eds) 1961. American Higher Education: A Documentary History. Chicago: University of Chicago Press p213-219

[15] Musselin, C. (2004) The Long March of French Universities. London: Taylor & Francis.

environmental science with economically relevant fields such as materials science. If past academic history provides any guidance, one era's controversial postulate may soon become another's taken for granted reality. Thus, academic scientists rejected proposals for federal funding of research during the 1930's depression calling it "tainted money", whereas the present generation knows no other mechanism of support and takes it for granted.[16] During the intervening period, US scientists volunteered their contribution to weapons research during the Second World War, accepting research funds from government, and acceding to their continuation after the halt of hostilities under conditions that were amenable to influence, if not control. [17]

With the notable exception of a relatively brief war-time and early post-war era, characterized by rapidly expanding public resources for academic research, US universities have traditionally lived with the expectation of scarce resources, even at times when resources were obviously expanding. As Derek Bok, former President of Harvard University, noted "Universities share one characteristic with compulsive gamblers and exiled royalty; there is never enough money to satisfy their desires." [18] Although federal investment in academic R&D increased during the 1990s, academic researchers strongly perceived a shortfall of resources during this period.[19] The explanation of this paradox lies in the expansionary dynamic inherent in an academic research structure, based upon a PhD training system that produces research as a by-product.

The contemporary university is an organizational mix of collegial and hierarchical patterns, shaped by academic, commercial, and socialgoals. Anearliergenerationofcritics,amongthemThorstein Veblen[20] and Upton Sinclair [21], argued that business forms of organization have shaped universities from the late nineteenth century. Despite some university presidents modelling themselves on corporate chief executives, the influence of faculty and students on academic decision-making has by no means disappeared. It may even have been enhanced since the passing of the era of autocratic academic leaders, exemplified by Nicholas Murray Butler at Columbia University, who brooked no interference in setting the conservative academic and political tone of his campus. The student anti-war movement forced Stanford to divest itself of the Stanford Research Institute and move secret research off campus during the Vietnam era while anti-apartheid protests led universities to sell off their investments in corporations doing business in South Africa.

Although there are periodic hiatuses, the knowledge of how to organize a social movement appears to be embedded in the DNA of academic culture and the recent spread of social media tools has, if anything, enhanced bottom-up organizing capabilities. Thus, the entrepreneurial university also includes social entrepreneurship, and the generation of social movements as academic by-products as well as the university's contribution to firm-formation and regional development. The

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[16] Personal communication from Professor Eli Ginzberg, Columbia University, to the author, 1995.

[17] Bush, V. (1945) *Science: The Endless Frontier*. Washington DC: US Government Printing Office.

[18] Bok, D. (2003) *Universities in the Marketplace: Commercialization of Higher Education.* Cambridge: Harvard University Press Bok, p9.

[19] Even as the NIH budget doubled, increasing roughly a the rate of 15% each year to 27.7 billion, academic researchers and their advocates were troubled that the increase would slow down to a few per-cent increase per year expected in the near future. "If growth were cut to 2.5% it would be a disaster" John H Porter, lobbyist, former Republican Congressperson. Kaiser, Jocelyn 2003 "House Bill Signals End of NIH's Double Digit Growth *Science* Vol 300 27 June p. 2019

[20] Veblen, T. (1918) *The Higher Learning in America.* New York: B W Huebsch.

[21] Sinclair, U. (1923) *The Goose Step: A Study of American Education*, Self published, 1923.

contemporary entrepreneurial university is the latest step in an academic progression in which the new task emanates as a controversial departure from previously accepted academic missions and eventually is integrated with the old and becomes accepted in its own right. These transitions are controversial. Thus, the introduction of economic and social development as an academic mission called into question the purpose of the university as a research institution, for some academics, even as the introduction of research as an academic mission disturbed the taken for granted assumption of the university as a single purpose educational institution.