

The Contribution of the Social Sciences to Knowledge based Development

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Summary

This paper examines the rise of knowledge based development as a series of ideas about how to achieve economic and social growth. It begins by outlining the significance of the idea of knowledge as a form of capital, introducing major bodies of academic work that have sought to explain the relationship between knowledge production and regional development. It then analyses the European and UK policies developed on the assumption that the key to future economic success lies in the deployment of knowledge and the active incubation of knowledge intensive industries. Attention is then focused on one of the key institutions in knowledge based development – the University. The paper considers the impact on universities based on the extensive literature on their changing role and mission. The paper then concentrates on conceptualisations of knowledge in knowledge based development discourse. I argue that policy and academic literature alike is focused on the kinds of knowledge that can readily be turned into intellectual property particularly that which is patentable. In conclusion I argue that this leads to the relative neglect of certain kinds of knowledge especially the social sciences. These neglected areas need more sustained attention in order to develop more nuanced conceptions of the role of social science in knowledge based development.

Introduction

In the 1990s, newly industrializing, deindustrializing and reindustrializing nations, somewhat to their surprise, find that they share a mutual interest in fostering knowledge-based economic and social developments requiring the creation of boundary spanning mechanisms. Despite their quite different developmental histories, a broad spectrum of societies, formally conceptualized under the divergent rubrics of the First, Second and Third Worlds, have formulated innovation strategies based upon the deliberate elaboration of academia-industry relations through reflexive science and technology policies.

(Leydesdorff and Etzkowitz, 1997, p.155)

The identification of a shift to knowledge based development is, as Leydesdorff and Etzkowitz (1997) observe, an international phenomenon which features in the development strategies of both developed and developing nations. Across the globe nation states, supra national organisations, universities and businesses are instigating and refining policies and programmes based on the analysis that the key to economic prosperity and social development lies in the successful exploitation of knowledge. Encouraging and incentivising the quest for new knowledge is increasingly an explicit aim of public policy as governments seek to emulate the successes of well known knowledge centres such as Silicon Valley in the USA and the Bangalore technopolis in India. As such knowledge based development (KBD) is the subject of a burgeoning literature explaining how knowledge can operate as a form of capital and the myriad consequences of public policy and private enterprise of conceptualising knowledge in this way.

This short paper contributes to this literature on knowledge based development. It focuses on initiatives aimed at capitalising on the knowledge generated by universities. This focus has been chosen as despite the diversification in the number and type of knowledge producing organisations (Gibbons et al., 1994) university based initiatives remain central both to thinking on how to develop knowledge economies and the subsequent policy prescriptions adopted. However, while the literature continues to grow there are still gaps our collective understanding of the role of universities in the knowledge economy. Scholarship overwhelmingly focuses on

use of science, medicine, engineering, and to a lesser extent the arts and humanities (see Charles, 2003 and Charles and Benneworth, 2002 for UK overview and Drucker and Goldstein, 2007 for US overview) while the contributions of the social sciences remain relatively under-researched. In this discussion paper I argue that more critical attention needs to be paid to the role of the social sciences in analyses of knowledge based development.

To achieve this purpose a certain amount of ground work is required in explaining the growth and development of KBD. It is not my intention to provide a comprehensive overview of the extensive literature on the subject but the first section of the paper explains some of the models which seek to articulate the case for promoting KBD and the significance of 'Knowledge economy' and 'knowledge society' discourse to policy. The next section focuses on the role of the university in initiatives to foster and promote KBD. Hence the first two sections of the paper are designed to set out why KBD is an important field of research, how it is defined, and the significance of universities to the practice of promoting KBD.

The second half of the paper focuses attention on the question 'what is knowledge in knowledge based development?' I argue that knowledge in this literature is strongly associated with that which can be turned into intellectual property particularly patents. Research on the knowledge economy has concentrated on measuring and monitoring patenting activity, using this as an indicator of the use of 'knowledge capital' (see Powell and Snellman, 2004 for classic example). Because the social sciences generate relatively few patents, or outcomes that are readily numerically measurable, they have been largely ignored in terms of their direct contribution to economic and social well being. Only a small number of publications have given sustained attention to the contributions and possibilities of the social sciences. The paper ends by suggesting why this might be an important omission.

Knowledge based development

Ideas about the significance of knowledge to development have a long provenance (Castells, 1996). However, it was not until the 1990s that a series of phrases and concepts started to be widely used that aimed to encapsulate the idea that knowledge was increasingly significant to our collective future. But while the prevalence of the term 'knowledge economy' makes it easy to uncritically assume its existence scholarship has revealed multiple ways in which the concept is problematic (Hudson, 1999; MacKinnon et al, 2002; Metcalfe and Ramlogan, 2005).

One of the chief problems lies in the difficulty of defining and explaining the trends and developments under analysis. There is no commonly agreed definition of what the knowledge economy/ society means with at least three definitions of the knowledge economy in current usage¹. But despite the lack of clarity the term is used repeatedly, without clear definition, in academic, policy and popular literature. Furthermore, there is little clarity on the differences between the commonly used phrases 'knowledge economy', 'knowledge society', 'information society' and 'information economy'. Hence I use the umbrella term 'knowledge based development' to describe the family of ideas, theories and trends which have at their heart the argument that knowledge is increasingly significant to development.

A further problem is that while it may seem intuitive that knowledge is a form of capital demonstrating the linkages between developments in the knowledge base and growing economic prosperity has proved more difficult than might initially be supposed (Kahin and Foray, 2006, p.1). Economists have encountered difficulties in measuring the significance of knowledge as the linkages are often indirect and knowledge itself is complex and elusive. The result has been a series of highly influential bodies of work which have sought to provide models and theories based on the analysis of successful case studies and prevalent economic trends. I briefly highlight three: Porter's work on the development of high tech clusters; the 'triple helix' and the 'associational economy'.

Michael Porter's work on clusters and their significance to supporting high wage, high innovation sectors has been influential in linking knowledge based growth to the economic competitiveness of regions and nations (Porter, 2003; 1990). In his work Porter has focused on Silicon Valley, USA highlighting the importance of the relationship between new knowledge producers and the private sector to the growth of such clusters. Frequent interaction and extensive networking through these relationships was argued by Porter to act as a catalyst to innovation, facilitating the rapid technological and commercial development of knowledge dependent sectors.

¹ Walby (2007, p.5 - 7) identifies three common approaches/understandings of the knowledge economy as 1) the specific industrial sectors of the economy that are most reliant on knowledge such as information and communication technologies; biotechnology and knowledge intensive services (this definition is used by the EU and OECD); 2) the way in which knowledge has changed all sectors of the economy, both new and emerging and; 3) the processes through which new knowledge is created and exchanged.

The triple helix model developed by Etzkowitz and Leydesdorff (Etzkowitz and Leydesdorff, 1997; 2000; 2001 and Etzkowitz, 1997) is designed to explain how successful national innovation systems work. The 'triple' refers to the three sectors involved in innovation (universities, business and government) while the 'helix' refers to the complex and intertwined nature of the relationships between the sectors. The triple helix concept has at its core the notion that partnership and interconnection between the producers and exploiters of knowledge is vital to economic development. However, the triple helix model gives more prominence to the role of government than Porter. Government, according to Etzkowitz and Leydesdorff, is vital because it both mediates relations between universities and business and creates the governance environment for fostering innovation. Etzkowitz and Leydesdorff (1997) also give relatively more attention to the role of universities in developing a knowledge economy, their edited book on universities in the global knowledge economy drawing on examples from around the globe of successful university driven innovation initiatives. As a model for conceptualising the economic utility and value of the knowledge produced by universities the triple helix model has had a major influence on universities and on governments being used extensively in reform initiatives designed to maximise the capitalization of knowledge.

The importance of relationships between the producers of knowledge and both the public and private sectors is underscored by Cooke and Morgan's work on the 'associational economy' (Cooke and Morgan, 1998). They emphasise the interactive nature of the innovation process, the importance of continuous communication and feedback between firms and the institutions of the innovation system (universities, regional development agencies etc) (p.13). Learning, according to Cooke and Morgan, is fundamental to economic success in an era of continuous technological advancement and growing use of knowledge resources. Hence the performance of firms depends heavily on their ability to learn (p.17). This ability to learn is influenced by the social and political system in which firms operate which is consequently vital to 'facilitating or frustrating' learning capacity (p.17).

The concepts briefly outlined above have been influential in providing a rationale for *why* an objective of public policy should be fostering knowledge and how this creates innovation and hence economic growth. The result has been the development of public policy and a series of practical initiatives in fostering knowledge based development that have been rationalised using the ideas of

Porter, Etzkowitz, Leydesdorff, Cooke, Morgan and a host of other scholars. In the remainder of this section I briefly review current policy at the EU and UK levels.

At the EU level there has been a strong drive to create competitive advantage through knowledge based development since the launch of the Lisbon Agenda in 2000. This committed EU member states to strive to become “the most competitive and dynamic knowledge based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion” (European Commission, 2000). A variety of policies to achieve Lisbon have since been pursued. These have included a series of programmes designed to stimulate research capabilities and to ensure knowledge transfer between research institutions and the private sector and a commitment to improving the skills of the EU workforce (Rodrigues, 2004).

The linkages between innovation and upskilling are also evident in more sustained policy analyses of the future of the economy. Gordon Brown writing in a HM Treasury document (Brown, 2005) cites the challenge as competing in the global market in the ‘race to the top’. China and India, he claims, are increasingly raising their game competing in high skill/high value sectors of the economy not just in mass production (p.7). The result is that across the EU it is imperative that skills levels are raised so that Europe can compete in high tech and high value added products and services. Brown claims that this is not merely aspiration. Between 1997 and 2002 seven million new jobs were created in what he describes as knowledge intensive services in the EU making it the fastest growing sector in terms of job creation (p.9). Brown also argues that there is a need to focus on innovation as the source material for high tech industry. R and D and patenting activity in the EU compares unfavourably with rates in the US and Japan (p.10) leading Brown to argue for continued and sustained investment in promoting innovation and entrepreneurship.

This section has covered extensive ground. I first identified one of the key problems of KBD - the lack of clarity on its definition. I then turned to the literature on the relationship between knowledge and development briefly reviewing some of the major contributions to thinking on KBD. Finally I have examined how KBD narrative has become integrated into policy. This again underlines how important KBD is not just as set of ideas about how to generate development but as the foundation of public policy for enterprise, innovation and education/skills. In the next section I review how KBD has impacted on universities and some of the consequences for thinking through their future development.

Universities and knowledge based development

Research led universities are frequently constructed as central to knowledge based development as was evident in the brief review of influential thinking on KDB (Cooke and Morgan, 1998; Etzkowitz and Leydesdorff, 1997; 2000; 2001). This is despite evidence that their dominant role in research and advanced learning is being challenged by other knowledge producing institutions including a growing number of public and private research institutes (Gibbons et al, 1994; Greenwood and Levin, 2000; Spink, 2001). But while it should be borne in mind that universities do not have a monopoly on knowledge production they still have a privileged status as a result their long history of publicly funded research, education and public service and as such occupy a central role in the KBD literature (Godin and Gingras, 2000; Stevens and Bagby, 2001). This role is, in effect, written into public policy in advanced nations through the systems of funding research and higher learning (Charles, 2003).

The extensive activities undertaken by universities to capitalise on knowledge production and to measure the economic impacts of the higher education sector suggest that many have been eager to exploit their privileged position (Charles, 2003; Charles and Benneworth, 2002; Drucker and Goldstein, 2007; Sargeant et al, 1998; Thanki, 1999). Many universities have capitalised on the idea that knowledge is a form of capital to position themselves as key actors in the national and regional economies in which they are situated. This has had important impacts on conceptualisations of the mission of universities and the role of the university in knowledge production and exploitation.

Scholarship on mission and direction of universities was recently reviewed by Delanty (2001a, pp.149 – 150) who identified four strands of argument in the literature:

- 1) the entrenched liberal critique (university seen as in crisis due to the decline in its autonomy)
- 2) the post modern thesis (knowledge and hence universities losing their emancipatory role because of the increasing fragmentation of knowledge)
- 3) the reflexivity thesis (a new mode of knowledge is developing based on new relationships between the users and producers of knowledge)
- 4) the globalisation thesis (universities becoming part of global markets and information based capitalism)

While inevitably a simplification the four broad strands assist in drawing attention to the controversial role of the university in a Knowledge economy. It also points to how

developments can be understood as either malign or benign dependent on intellectual and ideological perspective.

One of the most frequently cited contributions on the impacts of KBD on universities is Gibbons et al's 1994 work 'The New Production of Knowledge'. The authors argue that universities are evolving from traditional modes of knowledge production to 'mode 2'. Mode 2 is characterised by more socially accountable research paradigms which involve multiple actors from inside and outside the university from many different disciplinary backgrounds. Research in this mode is focused on application – on using research to tackle issues of interest beyond academia so that:

Mode 2 is characterised by a shift away from the search for fundamental principles towards modes of enquiry orientated towards contextualised results (p.19)

However, the critiques of Gibbons *et al.* suggest that there are grounds for arguing that many universities are a long way from being mode 2 institutions – that despite decades of public investment they do not have the infrastructure, the skills, or the knowledge required (Boucher et al., 2003; Harloe and Perry, 2004). Hence, in addition to the fundamental critiques of the modern university in strands 1 and 2 there are concerns even amongst those sympathetic to the notion of universities' role in KBD that the way in which universities are organised makes them remote from the concerns of many publics who have the potential to benefit from their knowledge advances. For example, Delanty (2001b, p.7) stresses the importance of opening up communication if universities are to avoid becoming self-referential arguing that engagement is important not only to the survival and growth of higher education institutions but also because knowledge is 'socially constructed'. In other words research needs engagement not just to maintain public support and ensure a role for universities but because good quality, rigorous research requires social interaction to be scoped, generated and understood. Although universities are conventionally understood as producers of knowledge they must also be conceptualised as users of knowledge generated in wider society and as part of social life (Delanty, 2001b, p.101 – 114).

Mary Lindenstien Walshok in her 1995 book 'Knowledge without boundaries: what America's research universities can do for the economy, the workplace and the community' provides a convincing articulation of the alternative to traditional conceptions of knowledge development. She argues that two things must happen in

order for research universities to maximise their potential socio-economic role (p.12). First, communication with a range of publics on universities' past contribution to economic and social development must be improved in order to explain their utility to the tax payers who fund them. Second, they need to develop better institutional mechanisms for communicating new knowledge and for getting publics involved in the generation of knowledge. For Walshok the issue of academic utility is not purely one of communication but of recognising that knowledge is not simply 'produced' by universities it is co-produced through interaction between academics and the stakeholders/ publics with whom they work (p.13). This in turn has implications for conceptions of knowledge. It points to the need to view knowledge not as artefacts that are uncovered but as something that is produced through social interaction. Knowledge is not the exclusive domain of the academic but is also held and mobilised by practitioners and professionals (p.13). This in turn has implications for knowledge production and dissemination. It suggests that outreach activity is vital not only to articulate the value of universities but as a means of generating new knowledge and interacting to ensure that this knowledge is developed so that it is usable outside the academy (p.17). Walshok argues that not all academic activity should be judged on whether it is potentially useful to publics, on the contrary she argues for the maintenance of basic research of little immediate instrumental value, but that universities must be able to successfully do outreach as well as more traditional research and that more should be done to overcome 'intellectual remoteness' (p.27)².

Research has shown that KBD creates a wealth of opportunities for universities as sites for knowledge production. However, the literature suggests that as a collective universities have a long way to go to maximise their role in the development of the regions and nations in which they are situated. This is not merely a challenge of improving outreach and engagement but raises questions about the nature of research and about sources of knowledge in good quality research (Delanty, 2001b; Etzkowitz and Leydesdorff, 1997; 2000; 2001; Gibbons et al., 1994; Walshok, 1995).

² Strikingly similar arguments for the need to re-conceptualise traditional ideas about knowledge production have been made from a different intellectual starting point. Analysts of 'knowledge transfer' have highlighted the development of multiple alternatives to the so-called 'linear model' (see Phillipson and Liddon, 2006)

Conceptions of knowledge in KBD: three reasons for addressing the neglect of the social sciences

The dominant conception of knowledge implicit in the literature on KBD is that which is factual, scientific and ownable (see Armstrong, 2001; Etzkowitz and Leydesdorff, 1997; 2000; and Powell and Snellman, 2004 for selected examples). This dominance of (certain types of) science and technology in KBD initiatives is also evident in the documents produced by universities themselves with a heavy emphasis of case studies of the generation of spin outs and intellectual property in science and engineering (Benneworth, 2007; Universities UK, 2002). Perhaps the most explicit rationale for why science dominates conceptions of economically valuable knowledge is expressed in Mokyr (2002) in his history of the knowledge economy. Examining the evolution of knowledge based development Mokyr argues that the history of economic development is the history of the exploitation of natural resources. For Mokyr useful knowledge can be reduced to technology and the basic science which is the basis of technological development. Hence useful knowledge for Mokyr is either propositional knowledge (theory) or prescriptive knowledge (technique). The result is that useful knowledge is easy to define it "describes the equipment we use in our game against nature" (p.284). One of the consequences of this narrow definition is that knowledge production is the work of scientific experts or as Mokyr puts it (p.284), "For better or for worse, the history of the growth of useful knowledge is the history of an elite".

In contrast to the wealth of literature on science and economic development literature searching using the terms 'knowledge economy' and 'knowledge based economy' reveals how little is written on the contribution of social science knowledge to economic development. The most notable exception is Rutton (2003) who offers an analysis of the potential contribution of social science to development in non-western societies from his perspective as a development economist. While the book focuses on how economists could co-operate with other academics in the social science disciplines of anthropology, sociology and political science he also addresses questions of the wider value of social scientific knowledge.

From Rutton's work we can identify one important respect in which social science knowledge is important to KBD: social science knowledge is vital to the institutional innovations necessary to adapt to the outcomes of technological innovation. Rutton therefore presents a case for consideration of social sciences in the knowledge based economy founded on the argument that scientific innovation necessitates

social and political innovation. Such innovation he argues occurs as the result of the development of social scientific knowledge alongside the development of political and economic resources, cultural endowments and new political ideologies (p.16). The first argument for incorporating the social sciences more explicitly into KBD discourse is, therefore, that innovation is social, political and economic as well as scientific/technological. To achieve development through utilising knowledge we need to mobilise resources for institutional change as well as scientific discovery.

The second reason returns to analysis that universities are faced with the challenge of moving from traditional models of scientific and technological development to the realisation of the benefits and inevitability of explicit 'co-production' of knowledge. Social science offers a rich and growing body of expertise on social interaction and communication for innovation. Social sciences also offer a range of methods and techniques to aid the co-production process. For example, the literature on action research offers rich and conceptually developed material on knowledge production in this mode (see Charles and Ward, 2007).

The third reason is less well developed in the existing literature (although it is a theme developed by Gibbons et al (2004)). KDB requires that opportunities and problems are approached not as disciplinary problems that can be left to a particular branch of science but more often than not require disciplines to work together. In other words although it is possible to divide knowledge into disciplines and faculties on the basis of its underlying philosophy and method such intellectual divisions of labour break down once knowledge is mobilised to address 'real world' problems and issues. While methods within such inter-disciplinary teams can remain plural work is required to ensure that problem formulation and research recommendations are commensurable across the disciplines employed. An important value of social science as a field of knowledge production derives from the need for technological and scientific innovation which is alive to the social circumstances in which it is deployed (see Leach and Scoones, 2006 for an exploration of why this is so important to the effectiveness of science and technology).

Conclusions: social science in knowledge based development

So far in this discussion paper I have sought to establish the following points:

- Although often poorly defined KBD is an important narrative of economic change which has spawned a series theories about how to foster further

development. These theories are 'hard wired' into public policy at all levels of government.

- While the role of universities in KBD is intellectually controversial, research has shown that universities are actively claiming a role in KBD.
- But while many universities are successfully developing a role in KBD some authors fear that many universities are ill equipped for the social engagement which KBD demands of them. KBD does not just require better communication and more public participation it also challenges the way in which research is done. KBD requires the 'co-production' of knowledge.
- It is already well understood that scientific and technological development is both reliant on social context for its very evolution and that the success of science based development is variable across different social and political environments. The exploitation of knowledge is about the design of new and more appropriate social, political and economic institutions as well as the discovery of phenomena and theory. Problems and opportunities will, more often than not, require inter-disciplinary approaches.

The need to co-produce knowledge in inter-disciplinary environments together with the need for institutional innovation provides the basis of the argument that social sciences are critical to successful knowledge based development. However, achieving such recognition is a mammoth challenge that requires intellectual labour to further understanding of social sciences and why they can not be ignored in KBD policy and practice.

The focus of KBD research has been on those forms of knowledge that are supposedly tactile and ubiquitous where fact can be exploited to generate 'technology' and hence money. The role of more contextual forms of knowledge needs to be explored not least because such approaches allow for a fuller understanding of the co-production vital to knowledge development. This requires further work on conceptualisations of knowledge in KBD which can recognise the need to integrate diverse disciplines to produce scholarship relevant to the lives of society as a whole and that recognises the complexities of contemporary knowledge production. Such a research agenda would be highly ambitious but is necessary to broadening ideas on the potentialities of using knowledge for economic and social development beyond extracting economic value from scientific fact.

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