

The Role of Universities in Achieving National and International Priorities: A Closer Look at Education, Research and Innovation

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Abstract: Universities are regarded as fundamental factors to the achievement of many national and international priorities. Universities are the only places where the ideas and rationales are brought together, and which make them the strongest providers of the rational explanation and meaning that societies need. Investments in the universities are increasingly based upon the belief that the science labs in research-intensive universities can be the source of a continuous stream of people and ideas that will spawn innovative and fast growing companies to form a knowledge-based economy. In teaching, universities shape new people, and in research, they create new possibilities. The university graduates learn to seek the true meaning of phenomena, to distinguish between the true and the merely seemingly true, to verify for themselves what is stable in that very unstable compound that often passes for knowledge. The challenge to both the governments and the university administrators is to permit autonomy without oppressive accountability, and to give staff and students the freedom to think, speculate and research. These are the very conditions of the personal and collective creativity that are the sources of a university's deepest benefits to its society.

Key words: University, Education, Research, Innovation, Higher Education, Priority, Society, Economy, Culture

The idea of the university:

In the book "The Idea of a University", John Henry Newman (1852) defined the university as a place for communication and circulation of thought. It is the place to which thousand schools make contributions and in which the intellect may safely range and speculate. It is a place where inquiry is pushed forward, discoveries verified and perfected, and error exposed, by the collision of mind with mind, and knowledge with knowledge. Some 40 years earlier, in 1810, Wilhelm von Humboldt, the founder of the University of Berlin, envisaged a university based upon three principles: unity of research and teaching, freedom of teaching and academic self-governance. The first was critical both of research divorced from teaching, undertaken by private scholars or in separate research institutes, without the stimulation of sharing those investigations with young minds, and of higher education divorced from original enquiry. The second was that professors should be free to teach in accordance with their studiously and rationally based convictions. The third principle, of academic self-government, was meant to protect academic work from the distortions of government control (Humboldt, W. 1903).

The universities based on Newman's and Humboldt's principles have been remarkably successful. Such universities have provided an almost universal model for higher education. The highly interactive social setting and operational freedom of such universities has stimulated a creativity that has made them one of the great entrepreneurial centers of the modern world. They are one of the fundamental agents that have made that world possible. Their capacities have been such that not only has their historical commitment to education and scholarship flourished and deepened, but they have absorbed in the last 40 years a massive increase in student numbers. They have been widely emulated, and arguably are sources of radical thought and social progress in societies where they have been introduced. In many countries they have also become the principal locations for the national research base, and have led the way in developing the cross-disciplinary concepts that are increasingly vital if we are to address many of the complex challenges to national and global societies (Boulton, G. and C. Lucas, 2011).

Indeed, this flexibility and adaptability have become the hallmarks of universities. They are testimony both to a dynamic process of engagement in the pursuit and explanation of knowledge and to a sensitivity to the needs of the contemporary world and to the problems that preoccupy it. Universities operate on a complex set of mutually sustaining fronts—they research into the most theoretical and intractable uncertainties of knowledge and yet also seek the practical application of discovery; they test, reinvigorate and carry forward the inherited knowledge of earlier generations; they seek to establish sound principles of reasoning and action which they teach to generations of students. Thus, universities operate on both the short and the long horizon.

A changing world:

The existing elements of success explain why, in the world of globalization, universities are now regarded as fundamental national and international assets. Governments worldwide see them as vital sources of new knowledge and innovative thinking, as providers of skilled personnel and credible credentials, as contributors to innovation, as attractors of international talent and business investment into a region, as agents of social justice and mobility, and as contributors to social and cultural vitality. It is not surprising therefore that universities have moved from the periphery to the centre of government agendas. Governments around the world have invested heavily in universities and made demands upon them about objectives and even the processes used to attain them.

Thus, over the last decade or so, there has been firmly established among governments around the world the view that high quality, internationally competitive research and higher education, mostly contained within universities, are prerequisites for long-term success in globalised knowledge economies. These are perceptions that drive the policy debate in Western countries and elsewhere about how university systems can affordably embrace both research universities capable of vying with the world's best, and provide higher education for a large proportion of the rising generation (Boulton, G. and C. Lucas, 2011).

Indeed, what is striking is that the realization of the importance of universities in the context of globalization has brought governments of most of the major economies to seek to regulate and stimulate universities in order to make them instruments of social and economic public policy. In fact, public policy sees universities as vectors of the contemporary skilling of an increasing segment of the population and as providers of innovation that can be translated into advantage in a fast changing global economic environment. This involves the use of regulation and incentives (especially financial) to obtain forms of behavior in universities that provide outcomes defined as desirable within this short-term frame of reference.

Direct Economic Benefit Of Universities:

The statements of government ministers, officials, funding agencies and research councils have in the last decade developed the following themes:

- (1) the function of universities is to provide direct benefits for society's economic prosperity;
- (2) there is a direct relationship between university applied research and economic prosperity through the medium of scientific and technical innovation spreading into the economy;
- (3) there is a high correlation between prosperity, social contentment and university research in science and technology;
- (4) and, universities have a primary duty to engage in this socially useful activity in exchange for taxpayers' support, and that research should only be supported if it is in the immediate national interest.

One direct consequence of these perceptions has been the enormously increased investment in university science research by many governments in recent decades. From the point of view of universities, this investment has indeed allowed a great upsurge in both the volume and the quality of science research. It is important for us to recognize here the substantial progress that has occurred in this domain. Moreover, in many universities there have been determined and effective developments in the application of new technologies derived from science research. There can be no doubt that large state investment has triggered institutional and individual creativity and the pursuit of more ambitious objectives (Boulton, G. and C. Lucas, 2011).

Many governments have adopted a simplistic reductionism in their perception of the connection between universities and globalization. Globalization is certainly the child of the breathtaking scientific and technological advances that have created the developments in communication whose rapidity and universality have astonished the vast majority of people who do not understand the technology. Whether globalization is the creation of this technology or simply another version of the globalizing tendency of nineteenth-century imperialisms hardly matters. What policy makers have seen is the power of technological innovation and the threat of world economic reordering that it poses. They have made a cursory connection between technology and science and then between science and the obvious place where public money is spent on it—universities. It is on this basis that policies of investing in university science with a particularly public benefit in view have emerged.

The university and "useful knowledge":

Universities are socially responsible and seek to improve the common good. Their perceptions and priorities change as those of their society change around them. Universities reconcile a transcendent mission of establishing understanding of the true nature of things with a social mission of relevance to their ambient population. This is not an easy task. What is attractive about current public policy for universities is that it does appeal to universities' desire for relevance in their mission. Universities' fundamental contribution to society lies in creating and passing on "useful knowledge", and engaging with society in its application (Boulton, G. and C. Lucas, 2011).

In the following sections, we examine how university contributions to society are achieved through their historic roles in education and research, and how they should best respond to current priorities for outreach, in contributing to innovation. They are by no means all the roles that universities do or could play, but are the major parts of their current effort.

Education:

There is, or should be, in university education, a concern not only with what is learned, but also with how it is learned. Too much pedagogy is concerned solely with the transfer of information. Even an education directed towards immediate vocational ends is less than it could be, and graduates are left with less potential than they might have, if it fails to engage the student in grappling with uncertainty, with deep underlying issues and with context. Generation by generation universities serve to make students think. They do so by feeding and training their instinct to understand and seek meaning. It is a process whereby young people, and those of more mature years who increasingly join them as students, are taught to question interpretations that are given to them, to reduce the chaos of information to the order of an analytical argument. They are taught to seek out what is relevant to the resolution of a problem; they learn progressively to identify problems for themselves and to resolve them by rational argument supported by evidence; and they learn not to be dismayed by complexity but to be capable and daring in unraveling it. They learn to seek the true meaning of things: to distinguish between the true and the merely seemingly true, to verify for themselves what is stable in that very unstable compound that often passes for knowledge. These are deeply personal, private goods, but they are also public goods. They are the qualities which every society needs in its citizens (Boulton, G. and C. Lucas, 2011).

Moreover, and once again, many of the qualities prized by government—entrepreneurship, managerial capacity, leadership, vision, teamwork, adaptability and the effective application of specific technical skills—are not primary features, but are derived from the more fundamental qualities explored in the previous paragraph. It is these qualities that policy and university management should seek to reinvigorate. The more recently advocated functions of universities are only part of a wider project which contains their essence. That capability which leads to economically significant outcomes is derivative from a deeper creativity. It has been misguidedly made to stand as a proxy for useful knowledge; but universities should read their function more widely and more intelligently (Boulton, G. and C. Lucas, 2011).

Globalization has increased the pressure for public and private goods to be marketed and sold as commodities. It has been argued that students should be regarded as customers, with the university as service provider, a view that many university managers have accepted, either implicitly or explicitly. This redefinition assumes a direct relationship between the acquisition of specific technical skills and their deployment in specific roles in the contemporary economy. Again, it reflects expectation of a relationship between the current demand for skills and university education. It assumes that the skills that society and the economy need are simply ones of technical specialization. It assumes a quasi-contractual relationship between the customer and provider, analogous to the skills one might pay to acquire in learning to drive a car. It subverts the open-ended, often transformative relationship between academics and their students that disturbs complacency and fits graduates to confront and deal with the challenges of complexity and change. The censorship exerted by current market need over what is difficult or innovative, or intellectually or aesthetically demanding can be such as to undermine the university's role to provide for the future (Boulton, G. and C. Lucas, 2011).

Research:

Successful research, whether in the sciences, humanities or social sciences, depends upon a culture and individual attitudes that value curiosity, skepticism, serendipity, creativity and genius. They are values that are crucial to the university educational process at its most profound, and are most readily acquired in an environment of free-ranging speculation and research that is permeated by them. Their transfer into society by graduates who embody them is an essential contribution to an innovative culture and a spirit of informed civic responsibility.

Not only does its research create the frame for a university's educational role, but universities have also proved to be highly cost effective settings for basic research in particular. The reasons may lie in their non-hierarchical nature, the pervasive presence of the irreverent young, whose minds are not so full of the means of refutation that original ideas are denied entry, and the highly competitive nature of most funding for university research, in contrast to specialist research institutes, where the peace and quiet to focus on a mission, undistracted by teaching or other responsibilities, and with relatively assured funding, may be a questionable blessing (May, R.M., 1997). By the same token, the excitable and dynamic nature of universities suits them much less well to the pursuit of long-term, strategic research objectives. This university inclination towards basic research, which seeks to explore the fundamentals of phenomena, also chimes well with their educational role, in stimulating the flexible modes of thought and creativity that are adaptable to a wide range of circumstances, and the deeply personal ownership of the basis for lifelong learning.

Universities, particularly comprehensive universities, are unique amongst human institutions in the range of knowledge they encompass. As a consequence, they have the potential rapidly to restructure and recombine their skills in novel ways to address both the many trans-disciplinary issues that are becoming increasingly important, and also to explore new, unexpected avenues of understanding. As the pace of unanticipated discovery and the urgency of demand increase, this capacity is increasingly vital, although universities have not exploited it as decisively as they should. Although much has been made of the need to develop and maintain critical mass in research, the critical diversity required to confront challenges as they arise or to create novel combinations of researchers to address evolving transdisciplinary demands is often more important. And electronic networks are no substitute for diverse and dynamic communities of place.

Innovation:

In the last decade, there has been a stress on the role of universities as the engines of innovation and economic development, and the drive to shift university behavior in order to give prominence or priority to these issues. The crucial question is whether and to what extent this is true and appropriate. The researchers have no doubt that universities have a fundamental contribution to make to the innovation process, but it is important to understand what that contribution is, and not to assume, as many increasingly do, that universities are direct drivers of innovation, and that this could be their primary rationale.

Universities can and do contribute to the innovation process, but not as its drivers. Innovation is dominantly a process of business engagement with markets, in which universities can only play a minor active role. Universities do however contribute to the fertility of the environment that innovation needs if it is to flourish. They help to create an environment sympathetic to and supportive of innovation, and particularly where they are associated with internationally competitive research and excellent graduates, they create a hubbub of creativity that attracts research intensive companies and investment into a region, and help catalyze innovation in indigenous businesses. The bedrock for this potential remains however the university's commitment to education in the deepest sense, and its exploration at and beyond the limits of human understanding. A recent study of the role of higher education in meeting international business demands (Richard, B., 2007) concludes that it is "the quality of staff at all levels that is the most important determinant of business competitiveness".

It is erroneous to think of innovation as a supply-driven process, fuelled by inventions, often created in universities, and particularly in science and technology. Although few would admit it, this can be the only rationale for some governmental policies of recent years. In practice, although attention must be given to the quality of supply of excellent education, excellent research and responsiveness to business needs, this of itself is not enough. Where demand is weak, excellent supply has rarely been sufficient to stimulate it. Governmental intervention has often been a powerful stimulus for demand, with government use of public procurement of research products from companies as a particularly potent device for stimulating the growth of knowledge-intensive companies (Richard, B., 2007). It is also the case that as the service sector becomes predominant in developed economies, knowledge-intensive growth depends on a much wider range of inspiration than just science and technology, and in which the arts and humanities are playing an increasing role (Boulton, G.S., 2007).

It is a common myth that the primary deficit in innovation is failure to exploit research inventions, and to overcome this deficit, that universities should be more pro-active agents of innovation. The university role in innovation is in developing human capital, at bachelors, masters and doctoral levels; in contributing to the intellectual, social and cultural resources of a region in ways that encourage inward investment of knowledge intensive business; in helping to stimulate entrepreneurial activity; and in collaborating with business to create mechanisms of interaction.

Academic Freedom:

For bodies that are largely funded from the public purse, universities and their staff have a unique freedom from governmental direction and control. But in an era where there is said to be a deepening crisis of trust and a culture of suspicion about public bodies and professionals, the demands for accountability in exchange for this freedom have grown. Although there has been widespread recognition of the value of university autonomy in permitting institutions to act decisively and flexibly in response to need or opportunity, and where state control is recognized as having been a barrier to development, freedom is necessarily accompanied by calls for greater accountability. However, accountability can often be controlled by another name. Increasingly bureaucratic mechanisms of accountability have been established to verify that the trust implied in freedom from control is justified. Detailed regulations, memoranda, instructions, guidance, and lists of "best practice" flood into institutions, too frequently focusing on processes rather than outcomes. Even then, such mechanisms rarely penetrate sufficiently deeply into the processes they are supposed to verify to achieve their aim. Quality assurance does not measure the quality of education, merely some of the second-order issues associated with education. Their principal result is to impose unproductive bureaucratic burdens. It is vital to understand that such mechanisms can ultimately undermine the outcomes that are a university's principal benefit to society. The

challenge to universities, government and society is to articulate a compact that recognizes the value of autonomy and freedom and supports them, but is able to assess the value and benefit without oppressive mechanisms that undermine a university's potential.

One of the dilemmas facing governments where they are the major funder of universities is to find an appropriate basis for funding: one that will enable them to be bold and creative in using their capacities to address the diversity of functions. Whilst universities should be funded for how well they do the things that make them what they are, it is too easy to develop one or two lines of funding, driven by metrics that stand proxy for deeper, elusive qualities, that so drive university behavior that they pour excessive efforts into the satisfaction of the metric rather than the properties metrics attempt to measure. Such metrics can also have the perverse consequence of driving out much of the creative diversity of behavior that is one of the university's great strengths.

Conclusions:

Universities generate a wide diversity of outputs. In research, they create new possibilities; in teaching, they shape new people. The two interact powerfully to generate emergent capacities that are adapted to the needs of the times, embodying and creating the potential for progress through the ideas and the people that will both respond to and shape an as yet unknown future.

It is important to remember that whatever policy-driven demands are placed on universities and whatever the desire to mandate particular outcomes, the space of the university is where discoveries cannot be determined in advance and where the consequences of the encounter between minds, between a mind, a problem and evidence, and between the minds of successive different generations are profoundly and marvelously unpredictable.

It is wrong to expect that universities will be dynamos of growth and huge generators of wealth, leading to economic prosperity and enhanced quality of life on anything like the scale that is implicit in such language. In most countries, governments are principal funders of universities and the assumption is that universities are a lever which, when pulled, will gush forth the tangible effects of economic prosperity into which public money has been transformed. In reality, universities can only be one part of the process of producing a successful knowledge economy.

Universities deal with the universality of knowledge; they are concerned with human beings in all their manifestations - biological, mental, emotional, objective and subjective - and their social, cultural and economic organizations and interactions with each other; they are concerned with the physical world within which human beings find themselves. They seek to understand that which we do not understand; they seek to explain complexity; they seek to discover that which is hidden from us. They seek to establish what is common to all of us and what distinguishes us each from another or each group from another. These things are common to the whole of university endeavor whatever the discipline. They are not "academic" in the pejorative sense of the word, but are of profound, practical utility. They are the foundation upon which the university enterprise rests and upon which its significance for society is built.

There are two important points to derive from these propositions. The first is that it is the totality of the university enterprise that is important. One cannot simply separate one element and say that is what we want and that is what we will pay for. Human society is not separable in the way that governments would necessarily wish to decompose it for the purpose of discrete policy actions. It is a complex interacting whole, which needs to be understood as a whole. No one discipline suffices to seize the whole - whether the whole individual or the whole social construct. Of course, public policy will place a premium on this or that aspect at different times, but it cannot simply set about neglecting the rest on the purely temporary and therefore relative grounds of a present concern. Indeed, universities are the only place in society where that totality of ourselves and our world is brought together. It is universities in their diversity of preoccupations that are the strongest providers of rational explanation and meaning that societies need.

Universities are not just supermarkets for a variety of public and private goods that are currently in demand, and whose value is defined by their perceived aggregate financial value. We assert that they have a deeper, fundamental role that permits them to adapt and respond to the changing values and needs of successive generations, and from which the outputs cherished by governments are but secondary derivatives. To define the university enterprise by these specific outputs, and to fund it only through metrics that measure them, is to misunderstand the nature of the enterprise and its potential to deliver social benefit. These issues of function and purpose are important, and need to be explicit.

The second point is that the instinct to understand, to find meaning, to map oneself and one's actions and the world, is essentially human, and it is one of the principal definitions of humanity. Therefore, those parts of the university and its research which deal with the human being as an individual or as a collectivity are as important as science and technology and are as central to the well-being of society.

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