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## Engaging with society, industry and business

## Topic Paper 4

### Introduction

Popular wisdom has it that the 'information age' – the shift from economic activity based on traditional industry arising from the industrial revolution to economies based on communications, computerisation, and the internet – is largely responsible for an unprecedented increase in the pace of change in our world. However, the pace of change in our societies has increased since the beginning of history. Competitiveness drives innovation, innovation in turn drives change and increases complexity, and increased complexity usually provides greater capacity for innovation. Participation and survival in a competitive world therefore of necessity requires the continuous development of innovative capacity based on new knowledge.

Universities have the potential to be key players in the innovation ecosystem of any society (Goddard 2000)[1]. The research-teaching nexus provides a unique opportunity for the creation of new knowledge alongside – and as an integral part of – the education of new generations of highly skilled innovators. These people drive change and increase the competitiveness of society in a myriad of ways – from scientific and technological development, through the creation of innovative and competitive business, to the development of social systems and cultures which enrich society because they are sensitive to – and built on - tradition, place, and history.

Universities therefore have the potential to play a key role in the scientific, social, and cultural development of society. This role has been described in varying terms by many authors, for example Castells (Castells 2001)[2] who described their activities in terms of four major functions: the expression of ideological debate, the selection and socialisation of elite leadership, the generation of knowledge, and the training of a skilled labour force.

It is very clear that universities cannot realise their potential to create benefit by operating in isolation from society. In just one (extreme) example: the provision of an education in isolation from developments in society around them will usually fail in producing graduates who are able to rapidly contribute to and innovate in that society. In another example: the undertaking of research in a system which lacks mechanisms to translate its results into benefits outside the institution can leave research as a sterile occupation where many of the benefits it can bring to the society that supports it are potentially missed (eg: ESRC description of Impact)[3]. The result is concomitant loss of opportunity in terms of economic competitiveness, individual and societal well-being, and cultural development.

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1    Goddard J. "The response of Universities to Regional needs" http://www.oecd.org/edu/imhe/40033173.pdf
2    Castells, M. (2001) "Universities as dynamic systems of contradictory functions"in J. Muller et.
         Al. (eds) Challenges of globalisation. South African debates with Manuel Castells, Cape Town: Maskew
         Miller Longman. 206-223.
3    http://www.esrc.ac.uk/research/evaluation-and-impact/what-is-impact/

The role of the University in modern society is clearly changing. Universities are rapidly evolving from institutions which traditionally fulfilled an academic role for its own sake, to become institutions which are seen as key drivers of progress, innovation, and competitiveness (Universities UK 2015)[4]. Whereas those working in universities might traditionally have seen the support they received from society as support for academic activity which was justifiable in - and of - itself, there has for some time been increasing realisation by academics across the world that support for university activities is seen by governments and as an investment which comes with substantial expectations for a return to society (Edwards and Marullo 1999)[5].

In achieving and demonstrating that return there is, then, a strong imperative for Universities to engage closely with the societies in which they operate.

This paper explores some of the benefits from that engagement for both society and the institutions, and looks at some examples of systems which are in operation across the world to stimulate and incentivise engagement and realise it's benefits.


**The benefits of engagement**

The importance of engagement by universities for both society and the universities themselves is rapidly increasing in the consciousness of policy makers across the world. For example, in the UK the National Coordinating Centre for Public Engagement has been funded by government and charity specifically to publicise the benefits of engagement. The organisation's website: http://www.publicengagement.ac.uk/ contains case studies, fact sheets, and research reports outlining the benefits of engagement in a wide sense, and illustrating how it can take place.

According to the NCCPE, the benefits of engagement by Universities with society accrue in three main areas:

1. Benefits to society
2. Benefits to the universities as institutions
3. Benefits to staff and students


*Benefits for society*

Engagement with society increases the flow of knowledge and skills from universities for the benefit of society. For example, effective engagement sees much more effective translation of new knowledge created through research activities within universities into practical benefits for people at large. It sees universities produce graduates whose knowledge and skills are directly relevant to the needs and direction of development of society in a broad range of areas, from business, through individual well-being, to cultural development and heritage protection.

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4    The economic role of UK universities , Universities UK 2015
5    Edwards, B., & Marullo, S. (1999). Universities in troubled times—Institutional responses. American Behavioral Scientist, 42(5), 754-765

Investment by universities in engagement focuses public attention and support on the many ways by which university activities benefit the lives of those in wider society.

University research is not only about scientific and technological innovation – rather, research into subjects such as business, society, and law is producing results which can substantially benefit society in areas such as business competitiveness and sustainability. Similarly, university teaching is not simply about skills acquisition, rather it produces people and outcomes which can have a direct bearing on factors which fundamentally influence the development of society, such as social justice, corporate responsibility, and the democratic process. By integrating public engagement activities throughout their work, universities are better able to respond to social need, contribute to social justice, and support beneficial change in society.

For innovation to effectively take root in society, the concept of innovation and the innovators must be trusted. Universities are a key source of innovation and innovators. Effective public engagement supports the building of trust between society and those who are responsible for creating change within it – thereby helping to embed innovative capacity into society on a sustainable basis.

In research, many of the most exciting new ideas have come from conversations between those undertaking research and those who use it's results. Similarly, engagement between universities and society can stimulate new ideas and enhance the creativity of society as a whole.

*Benefits to the universities as institutions*

In the extreme case, undertaking research and teaching without reference to the needs of society creates substantial risk that the products of those activities will not be relevant to society. Additionally, ideas, experience, and information from the communities served by the universities can substantially increase the innovativeness of research and the quality of teaching. Research projects which have been designed in partnership with society usually have substantially more impact and relevance, and curricula which are developed in consultation with those who will employ or interact with graduates as they enter the world of work will be substantially more relevant and useful to both society and the graduates themselves.

For universities to prosper in society it is crucial that members of the public both understand their missions, role, and activities, and trust those who work in them. Engagement activities provide a more effective and meaningful alternative to marketing approaches in gaining that understanding and trust – showing those outside the institutions that universities listen, debate meaningfully, and change. Engagement activities provide a powerful way to build a meaningful brand which is widely understood and respected in society.

As pressure on public funding inexorably increases, universities are increasingly being required to demonstrate a return on public investment and accountability for the funding with which they are provided. Public engagement activities demonstrate openness, transparency, and accountability – leading to well-informed debate about investment and the returns that it provides. They are a key factor in ensuring that universities have access to appropriate and reasonable funding on an on-going basis.

*Benefits for students and staff*

Fee-paying students in modern universities are most-often looking for a university experience that gives them competitive advantage in kick-starting their careers following university. For the majority of students in western countries this translates to a desire to get a good, stable, job soon after graduating. For some, it means having the education and skills to become successful entrepreneurs, or to work on a self-employed basis.

As the section on employability in this conference shows, successful students plan their career and begin the process of gaining the first job on graduation long before they leave university. This requires both the acquisition of skills relevant to employers, and the development of networks within the business/employer community outside university – while they are still undergraduates. Engagement by the university with businesses and outside employers greatly assists this process, providing students with opportunities to create networks and gain experience relevant to the job market *prior to* graduating, and – crucially – providing them with the opportunity to know what employers see as relevant key skills and the opportunity to acquire them.

The situation is similar for those who decide to follow a self-employed or entrepreneurial career path on leaving university. Networks are crucially important for successful business, and university engagement with the entrepreneur community enables these students to both build the necessary networks and acquire the non-academic skills necessary to successfully exploit them prior to graduating – again giving competitive advantage on leaving university.

In addition to these very practical employment reasons, most university students have a strong desire to improve things in society. In addition to providing opportunities for experiences relevant to the job market, university engagement provides students with opportunities to gain valuable experience (in for example team-working, leadership, problem-solving) through volunteering and social-enterprise activities.

Finally, engagement with the public helps both staff and students to better understand the needs and concerns of society. For staff this may centre around understanding what the next grand challenge in research (or the translation of research results) might be, understanding ethical issues to do with research and teaching, or understanding public concerns regarding the effects of new technologies on society. For students, it may include gaining a better understanding of how to make society work better in terms of social justice, ethics, and cultural development.

There are many other detailed examples which illustrate how university engagement creates substantial benefits for society, and the institutions and their members. Given the very substantial investment in university systems in all countries of the world, it is very clear that stimulating and incentivising effective university engagement with society is a factor in both creating an effective and sustainable university sector, and ensuring that benefits to society from the university sector are optimised on in a broad range of areas – not least in terms of making effective use of research results gained within the institutions.

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**Universities as creators of 'Place'**

The previous section explored some specific stakeholder benefits accruing from successful engagement of universities with society at large. However, there are other less specific long-term benefits which nonetheless run much deeper through the fabric of society than the simple translation of new knowledge into immediate benefits in (for example) health, or the production of graduates who are able to rapidly and effectively contribute to economic activity.

The role that universities are normally assigned to in society is the production of skilled labour and research to meet economic needs. However, in periods of rapid change universities are involved in much more than this – for example they often have roles in the building (or re-building) of civil institutions, in developing and promulgating new cultural values, and in producing and socialising new social elites (Brennan, King, and Lebeau 2004)[6]. In times of rapid change they can play a key role in achieving economic, social, and cultural transformation.

Although the role of universities in moulding society may be most apparent in times of disruptive, radical, change  - they nonetheless play a similar role through periods where society evolves more naturally. Indeed, under these circumstances, although their role is more subtle universities may eventually be involved in more substantial long-term transformations than under the rapid-change scenario. If truly engaged, their work helps define society's perception of itself, that is:- the sense of 'place' and understanding of self and environment that is fundamental to stability in any sustainably evolving society and culture.

In this sense, the role of the engaged university is perhaps most important of all, for it contributes to fundamental determinants of the ultimate success and progress of society as a whole.

**Key factors affecting the achievement of effective engagement**

The achievement of effective engagement between universities and their communities depends on a wide range of different factors and has been studied in detail by several authors. Amongst these – in the UK regional context – Goddard (Goddard 2000)[7] has described a comprehensive suite of drivers for community engagement in teaching and research, together with a matching suite of barriers which need to overcome to make the engagement effective.. A selection from these is given below:

Key drivers for engagement via teaching activities include:

- Historical roots linking the institution firmly to its local economic base, its city or local authority which may or may not coincide with a formally defined region.
- A desire to increase the uptake of graduates into employment in order to enhance key institutional performance indicators, and likelihood of building collaborations with firms.
- A desire to create new "ladders of opportunity" for students through access, franchise,

6    "The Role of Universities in the Transformation of Societies", John Brennan, Roger King and Yann Lebeau, Centre for Higher Education Research and Information, Open University, 2004

7    Goddard J. "The response of Universities to Regional needs" http://www.oecd.org/edu/imhe/40033173.pdf

compact, and other arrangements.

- Momentum created by significant levels of graduate placement in local firms and students involved in the local economy through part-time jobs, placements, vacation work and project work.

Key drivers for engagement via research are different and include:

- Perceived thrust of government policy towards promoting industrial links.
- Regional thrust for a technology development and transfer policy aimed at economic development.
- Demand from government and others for HEI involvement as a pre-condition of competitively awarded industrial assistance.
- Links between HEIs and the health sector.

In both areas, effective leadership both within the universities and the external community should be added as a key driver of success.

There are numerous barriers to engagement via teaching which include:

- Government caps on the number of publicly funded students which can lock HEIs into an historic pattern of nationally-driven subject provision which ignores regional needs and therefore mitigates against local engagement.
- Weakly developed national and regional economic development strategies
- Academic promotion and other reward systems which fail to recognise work to improve engagement with the external community – for example the design and delivery of professional development short courses etc.
- Anxiety about the "decline in standards" believed to be attendant on the increased diversity of course provision at undergraduate and postgraduate levels and a consequent desire for stiffer national/international benchmarking.
- Perception that new programmes which address development needs at undergraduate level can only be introduced at the expense of established programmes.
- Content and mode of delivery of courses at undergraduate and postgraduate level determined by external accreditation from professional bodies with little regard for regional development needs.
- Difficulty of matching the attributes of graduates and the skill needs of local employers, especially SMEs.
- Ineffective executive/implementation links between the senior management team and individual academics such that engagement policy initiatives agreed by senior management team members are not in fact followed through at the level of teaching.
- Costs of regional collaborative projects which have high start-up costs or require substantial amounts of time from senior staff and offer only short term funding.
- Too few stakeholders willing to contribute to the development of a pool of high level skills in the region, fearing that enhanced skills only make people more mobile and therefore part of national and international, rather than regional, labour markets.

To these one might also add:

- Funding for teaching not targeted at skill shortages arising from the application of research.
- Funding for teaching not driven by any national innovation agenda.

Barriers to engagement via research tend to be more driven by overemphasis on promoting and protecting institutional and national research reputation as measured by position in the league tables, rather than achievement of benefits for society at large, and include:

- Judgement of research quality by academic peers is deeply entrenched and 'research excellence' is rewarded rather than research impact. This may militate against the success of projects that have a regional development focus either because they look parochial, or because they are replicative of work elsewhere rather than breaking new ground, or because they look too "applied" as opposed to "basic".
- Research agenda heavily influenced by the Research Councils (or equivalent) and national Government priorities which are aimed at demonstrating international competitiveness in research rather than economic and social development.
- Academic staff promotion depending on original research of national/international significance with no incentive for applying the research findings to the solution of problems in local companies.
- Base funding for research in HEIs is selective, and likely to get more so, to the advantage of institutions in the 'superleague' who tend not to have economic development concerns at the heart of their mission but rather concentrate on international research league table position.
- The informal networks which usually can be powerful determinants of the success or otherwise of research have a national, and international, base maintained through research conferences or subject associations, the external examiner system, and co-membership of national committees.
- HEIs overvalue their intellectual property and concentrate on protecting it for their own advantage rather than working to see it exploited for external benefit.

Ostrander (Ostrander 2004)[8] has summarises the key factors for successful engagement from a university perspective as follows:

- A historic, founding commitment of the institution to public benefit;
- A well-articulated university mission statement containing strategic objectives directly related to civic participation and the value of connecting theory to practice;
- A compelling reason to alter core curriculum to integrate civic engagement and a willingness and a capacity to utilize established knowledge about how students learn;
- An active faculty who participate in the work of the university through established structures of faculty governance, which can be used to institutionalize civic engagement;

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8    "Democracy, Civic Participation, and the University: A Comparative Study of Civic Engagement on Five Campuses" Ostrander S.A. Nonprofit and Voluntary Sector Quarterly 2004; 33; 74

and,

- Surrounding neighborhood conditions that propel or necessitate the university to become actively involved and provide community partners with whom to work.

Although the imperative to university engagement with their communities of interest has been strong for many years now, it is clear that substantial barriers still exist despite the development of numerous policy initiatives in areas such as the UK and Western Europe over several years. There is no single recipe for success – rather it has become clear that multiple connected initiatives are required to change attitudes, incentivise behaviour, and generate an environment where the benefits of engagement are understood and appreciated, engagement work is recognised on all sides as high priority, and all players involved perceive that they gain benefit at their level in addition to the overall benefits accruing to society at large.

**Policy initiatives for promoting university engagement**

In this section some policy initiatives aimed at increasing the engagement of universities in several countries are explored. This is by no means a comprehensive list. In addition to national initiatives many countries also have numerous substantial local initiatives targeted at increasing interactions between universities within particular regions. These are usually designed to contribute to the bolstering of economic development or the solution of particular regional issues.

**The UK**

The Higher Education Funding Council for England (HEFCE) defines public engagement as:

> *"bringing together Higher Education specialists and non-specialists to develop new channels of communication and mutual understanding. The 'public' includes individuals and groups who do not currently have a formal relationship with an HEI through teaching, research or knowledge transfer."*

The National Coordinating Centre for Public Engagement[9] (http://www.publicengagement.ac.uk) was set up in 2008 as part of an initiative to substantially change the way in which UK universities interact with the public. The Centre arose from the 'Beacons for Public Engagement' project in which brought together several key bodies – including the Higher Education Funding Councils, Research Councils UK, and the Wellcome Trust to fund a pilot project in which six collaborating centres and one coordinating centre to promote public engagement by universities were set up across the country. The University of Bristol and the University of the West of England were selected to host the National Co-ordinating Centre for Public Engagement, which was formally established in 2008. The six Beacons were based in: Newcastle and Durham, Manchester, The University of East Anglia, UCL, Wales, and Edinburgh, to:

> *"create a culture within UK Higher Education where Public Engagement is formalised and embedded as a valued and recognised activity for staff at all levels, and for*

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9         National Coordinating Centre for Public Engagement Website: http://www.publicengagement.ac.uk

*students."*

Although central funding for the individual pilot beacon centres ceased in 2011, the project saw a large increase in awareness of the importance of public engagement by UK universities, and many of them have now funded their own centres, for example:

University College London:   https://www.ucl.ac.uk/public-engagement/whatispublicengagement
Bristol university:   http://www.bristol.ac.uk/public-engagement
University of Manchester:   http://www.engagement.manchester.ac.uk/about/index.html

Funding for the National Coordinating Centre continues, with three strategic aims:

*1. Inspire a shift in culture*
  *By supporting universities in bringing about strategic change that embeds public engagement*
  *By identifying, developing and disseminating evidence-informed practice*

*2. Increase capacity for public engagement*
  *By brokering and encouraging the sharing of effective practice*
  *By capturing learning from the beacons and beyond and sharing it widely*

*3. Build effective partnerships to encourage partners to embed public engagement in their work*
  *By informing, influencing and interpreting policy*
  *By raising the status of public engagement*

It is also worth noting two other initiatives supported by HEFCE which are aimed at increasing interactions between universities and industry/business.

*The Higher Education Innovation Fund*

The first of these is the Higher Education Innovation Fund (HEIF)[10]. The fund provides £150M per annum which is aimed promoting knowledge exchange activities (mainly arising from research) within universities. Funding is allocated based on performance metrics which broadly measure income from a subset of engagement activity and include:

- Contract research income
- Consultancy income
- Income from use of facilities and equipment
- HESA non-credit-bearing continuing professional development courses
- Regeneration income
- Intellectual property income

Allocations are released against plans for knowledge exchange activities which are filed annually with HEFCE.

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10  http://www.hefce.ac.uk/kess/heif/

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*Introduction of 'Impact' into the periodic research assessment exercise (The Research Excellence Framework)[11]*

The second initiative is the introduction of the evaluation of 'Research Impact' in 2013 as part of the periodic research assessment exercise (the 'Research Excellence Framework') coordinated by HEFCE across the UK. The Research Excellence Framework sees evaluation of the quality of research undertaken in UK universities by panels of peers. £1.58 billion of research funding per annum is allocated to universities by HEFCE on the basis of weighted quality scores they achieve during the assessment exercise. From 2013, the evaluation of research quality also included an evaluation of the impact of research undertaken at institutions during the previous 15 years. The 'impact' evaluation was designed to recognise the economic and social benefits outside the institutions of excellent research undertaken in UK universities. This might include, for example, the development of successful new products based on the research, improved healthcare outcomes resulting from the research, or developments in national or international policies which are directly linked to the research. Scores for impact were based on evaluations of statements, case studies, and supporting evidence regarding the impact of research projects achieved during the evaluation period (2008 – 2013) undertaken in the institution.

Alongside the adjudged academic excellence of the research and the assessed quality of the environment at each institution, the impact score received substantial weighting in the allocation of funding as follows:

| Attribute | Weighting |
|---|---|
| Excellence of outputs from the Research | 65% |
| Impact of the Research | 20% |
| Quality of the research environment at the institution | 15% |

The weighting for impact will increase to 20% in subsequent evaluation exercises (the next exercise is currently expected in 2020)

**In Europe: Germany**

Active recognition of the potential for universities to contribute to the innovation ecosystem through engagement activities – particularly regional engagement activities – is a relatively new phenomenon in Germany. However, engagement activities in terms of knowledge exchange and joint research and development activities with industry and regional development players is now gaining momentum, with several central government initiatives working in tandem with the efforts of individual regions and their universities to create large-scale projects for deeply embedding university research activities into industrial development in some regions.

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11  http://www.ref.ac.uk/

In part, this has been enabled by the fact that perceptions of the role of universities in Germany has changed substantially in recent years:- in the past they were perceived (indeed were) publically controlled objects, but changes in governance and increases in autonomy brought about through several amendments to the Federal Framework Act, the Hochschulrahmengesetz (HRG), from 1998 onwards aimed to increase the international competitiveness of German universities through deregulation and incentives and funding initiatives linked to performance. These changes to the law together with the introduction of 'Goal Agreements' in some German state saw substantial shifts in thinking in university management and leadership – including an increased focus on the strategic use of regional activities of the university to further its aims and secure its future. One of the most common types of activities in this context has been the creation of new forms of strategic research collaboration with industry – and for some universities these have become large-scale activities which are key driving factors for research excellence and relevance (Koschatzky and Stahlecker 2008)[12]. Momentum in this direction has been substantially enhanced by the introduction of the ResearchCampus (Forschungs Campus) programme.

*The Forschungs Campus (ResearchCampus) Programme[13]*

The ResearchCampus Programme was initiated by the German Federal Ministry of Education and Research in 2012 and is an ambitious, centrally-funded programme which is beginning to have significantly effect on the regional engagement activities of German universities. One feature of the programme is that it is nationally driven but makes use of initiatives which are implemented at a regional or sub-regional level. In this way it is compatible with both national and regional goals in a federated state. It should be noted that the primary focus of the programme is not to stimulate regional engagement activities – rather it is to stimulate and optimise the creation of research and technology development capability for what is ultimately the national benefit. It does this by creating long term, strategic, public-private partnerships which are embedded in and intrinsically identified with a particular region of the country. It recognises that innovation in Germany is crucially dependant on the ability to translate research results into practical outcomes which are used by industry, and that translation of research results is itself greatly facilitated by research co-operation at the interface between business and academia.

Under the ResearchCampus scheme, joint initiatives between universities and industry are competitively funded and must have the following characteristics:

- Proximity – research capability and activities are grouped together at one location – preferably on a university campus or that of a public research institution
- The initiative is framed around a specific long- or medium-term research project, usually with a well-designed research programme
- The initiative must be a public-private partnership
- One or several universities must be involved, at least one non-university research centre, and several companies.

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12  "The changing role of universities in the German research system: engagement in regional networks, clusters and beyond" Knut Koschatzky and Thomas Stahlecker Fraunhofer Working Paper R2/2010
13  http://www.bmbf.de/en/16944.php

The programme initially aimed to focus on SME involvement in ResearchCampuses, but in practice it has turned out that company involvement has been mainly from large companies, many of which are multinational.

The ResearchCampus programme present universities with a range of new challenges, most of which automatically lead to better understanding of and engagement with industry. Models for handling intellectual property, the development of entrepreneurial and business attitudes amongst the university staff involved, new types of more flexible and beneficial employment contracts for involved university personnel, design of research programmes which are directly relevant to industrial and business development needs, and accountability for outcomes from research funding by public and private sources are just some of the learnings on both sides from these projects.

Funding for each ResearchCampus is substantial: 1 – 2 million Euros per annum, and this is of course a substantial incentive for universities to seek involvement in the programme. However, substantial other benefits are also seen by university managers in terms of opportunities to strengthen the capabilities of their institutions and to gain attention and reputation both regionally and nationally.

A list of current ResearchCampuses is given below.

| German ResearchCampus Initiatives | |
|---|---|
| **Project** | **University** |
| ARENA2036 – Active Research Environment for the Next Generation of Automobiles, Stuttgart | University of Stuttgart |
| Digital Photonic Production, Aachen | RWTH Aachen |
| Future Electric Grids, Aachen | RWTH Aachen |
| EUREF Forschungscampus: Sustainable Development of Energy and Mobility by Coupling Intelligent Grids and Electromobility – "Mobility2Grid", Berlin | Technische Universität Berlin |
| InfectoGnostics, Jena | Friedrich Schiller University Jena |
| Mannheim Molecular Intervention Environment (M2OLIE), Mannheim | Medical Research Center, Heidelberg University |
| Mathematical Optimization and Data Analysis Laboratory – MODAL AG, Berlin | Zuse Institute Berlin |
| Open Hybrid LabFactory, Wolfsburg | Technische Universität Braunschweig |
| STIMULATE – Solution Centre for Image Guided Local Therapies, Magdeburg | Otto von Guericke University of Magdeburg |

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**Conclusion**

This paper summarises the case made for strong engagement by universities with the society in which they work. Engagement at a range of levels has the potential to bring substantial benefits and advantages in economic, social, cultural, and academic terms. It can benefit society, the students and staff of the institutions, and the institutions themselves.

Experience internationally indicates that the creation of an environment for effective engagement relies on multiple factors including:

- Appropriate charters, governance, and missions for the institutions themselves
- Appropriate policy environments, nationally, regionally, and within the institutions themselves, which creates the right understanding and incentives
- An optimal mix of regional and national initiatives driven by overall national imperatives
- Seed funding at both national and regional levels for policy and information dissemination and pilot projects to demonstrate benefits and effectiveness

The question for any university system is then not so much: 'Should engagement between universities, society, business, and industry be promoted?' but rather 'How is engagement between universities, society, business, and industry optimally promoted to maximise national benefit?'. Hopefully, this paper will help inform and progress that debate.

**Professor Tom Barnes**
**September, 2015**