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Higher Education and Regions:
Globally Competitive, Locally Engaged

Chapter 8

Building Capacity for Co-operation between Higher Education and Regions

Interactions between higher education institutions and the region in which they are located can be beneficial to both parties. For this interaction to take place bridges have to be constructed based on firm pillars on both sides. This chapter seeks to identify the elements for developing the capacity for joint working between regional actors and agencies and higher education institutions in the round, not just particular institutions or parts of institutions. These are the building blocks for the pillars and the spanning techniques for bridging the gap to enable the traffic to flow from one side to the other. In regions where there is more than one higher education institution and a number of sub-regions this implies developing the capacity of the region as a whole.

The higher education pillar

Institutional autonomy and leadership

Strong institutional leadership embraces issues of strategic direction and operational management of the institutions. Some structures of governance set constraints on what a higher education institution can plan and do. These include the traditions whereby academic leaders are chosen from and return to the ranks of the professoriate after a short spell in office. There are two dimensions to this: the higher education institution needs autonomy in relation to central government and the institutional leadership needs authority in relation to the faculties. Where the central authority of the higher education institution is weak and the faculties remain strong, the reach and scope as well as the time-span for leadership may be curtailed.

If the administration has not been modernised for example in terms of human resources and financial resources management and this has not been underpinned by effective IT systems, the capacity to secure and monitor effective action is further limited. This sets constraints to the institutional capacity to plan for and enter into sustained partnerships. The constraints are particularly prominent in regional development as the mission of regional engagement is less familiar and therefore more likely to encounter greater academic resistance than efforts to enhance conventional teaching and research.

Countries wishing to see the shifts of culture and direction that entrepreneurial activity and regional engagement requires will need to consider the legal and regulatory changes necessary to enable strong leadership of higher education institutions to emerge. This involves strengthening the autonomy of higher education institutions by increasing the responsibility over the curriculum and the use of human and financial resources. It may extend to changes in the ownership of real estate, and other capital investment that underpins capable leadership and the institution's ability to invest in place making.

Strong leadership means also reforming discipline-based structures that prevent engagement with the trans-disciplinary problems of the region and the "real world". This report has earlier referred to the management of younger higher education institutions (Chapter 3). The external mechanisms which mobilise such institutions to support the region are often better

developed than those of the older institutions, for example through the use of a variety of performance measures. This is the case for example with many polytechnics in Finland. (See Box 8.1.)

Developing leadership skills

What practical steps can be taken to ensure that leaders have the necessary skills to undertake the challenging boundary spanning tasks? The European Universities Association and the OECD have long recognised the need for leadership development, and more recently programmes for senior management in higher education are being established in several OECD countries. For example the Leadership Foundation has been established by the Higher Education Funding Council for England. It aims among other things to deliver a programme relevant to leadership in regional engagement. New post-graduate and executive programmes on the business school model are

Box 8.1. **Higher education management at the Jyväskylä University of Applied Sciences: supporting regional engagement**

Jyväskylä University of Applied Sciences (formerly Jyväskylä Polytechnic) in central Finland has a set of engagement activities which help the institution to respond to local needs as well as to bring local stakeholders into the institution to help with the delivery of education. One of the institution's past challenges involved the integration of seven constituent vocational colleges into one higher education institution which meets the needs of the regional businesses and working life in general. This merger process has strengthened the institution's capacity to develop new cross- and multi-disciplinary courses and educational trajectories in existing and emerging disciplinary areas to meet the needs of firms.

The institution is particularly well equipped to work with the SMEs which form the backbone of the regional economy in Central Finland. It has defined nine multi-disciplinary Centres of Expertise which respond to regional needs. Each school has an external board as well as a regional/business development office. Most significantly, it also maintains a sophisticated management information system which tracks the performance of each individual school. Of 29 Balanced Scorecard indicators, 8 are specifically linked to regional engagement. The school-based indicators are regularly monitored by the central management team. Strategic planning is implemented as part of the elaboration and annual revision of the three-year Agreement on Objectives set with the Ministry of Education. The planning process translates these objectives into school-, team- and personal-level goals and actions. Strategies are brought into practice through the Balanced Score Card.

making an appearance. In addition to the soft skills of leadership, such programmes need to focus on the generic issues regarding regional development and engagement and the facts regarding their own region (such as powers and responsibilities of external actors and agencies, and the dynamics of the regional economy).

Some of the knowledge and expertise necessary to advise leaders may reside in their own institutions. In the current OECD study, several self-evaluation reports include contributions from research groups within the higher education institution specialising in different aspects of regional engagement and/or higher education/management.[1] While many of these groups are actively involved in providing advice to regional agencies, they are not always used by the academic leadership to guide institution wide policy and practice in this domain.

Management of regional engagement

Influencing and managing the external environment of the higher education institution is a time consuming task. This includes making and sustaining strategic regional partnerships and assuming real and shared responsibility for the prosperity and development of the region. Modern higher education institutions find the scale and scope of top leadership too much for any one person and devise means of dividing this between key people. Another approach is to retain a single institutional head, but to delegate almost the entirety of internal management and development to a fully empowered deputy.

For managing its regional interface the higher education institution may need to establish a regional office. This has happened *e.g.* in the Purdue University (Indiana, USA) and the University of Newcastle upon Tyne (UK). Regional offices are helpful when scaling up the institutional capacity from individual good practice cases to a well developed system. A systematic approach will require focus on the following tasks: co-ordination and management of regional links; provision of input to strategic planning; contribution to the marketing of the institution; development of frameworks for engagement and regional understanding within the institution; and maintaining pressure for mainstreaming of regional engagement through the normal channels of the institution (OECD, 1999). (See also Chapter 5.)

The regional office needs to retain close links to the head of the institution. While it is desirable to have a senior (second tier) person heading this office and exercising responsibility and oversight for all 3rd task policy and activity, it is essential that this does not separate it from teaching/learning and research. The third task means permeating and transforming much of the teaching and research strategy and practice of the higher education

institution. Managing, monitoring and developing engagement, regional partnership and development require consistent interrogation of all academic and administrative activities.

Mobilising the institution to regional engagement

Regional engagement is not only the task of the top leadership and management. Higher education institutions wishing to mobilise their staff in support of this agenda need to ensure that it is taken into consideration in the recruitment, hiring and reward systems as well as human resources development. Leadership requires underpinning with tangible rewards and incentives that make it possible to change behaviour and ultimately attitudes and values. Employment and human resources management practices need to allow greater segregation of roles among academic staff, with different kinds of workloads and reward systems. Reward systems have been developed for example in Australia, in the University of the Sunshine Coast (Box 8.2).

One of the key factors of success in regional partnerships is the presence of facilitators who act as gate keepers between the different networks and organisations. If higher education institutions wish to mainstream the regional agenda, they will require a number of staff with knowledge of regional development including: *a)* structure of the organisations involved in regional development; *b)* central, regional and local government powers and responsibilities; *c)* different time scales and drivers influencing these organisations; and *d)* overlaps between organisations and how these can be used to mutual advantage. A tailored human resources development programme for

Box 8.2. **Rewarding staff for regional engagement**

In 2005, after extensive consultation with key stakeholders, a new Promotion Policy was developed in the University of the Sunshine Coast, Australia, to improve alignment between the university's mission and this fundamental component of the university's recognition and reward system. The new policy defines, clarifies and reinforces the behaviours expected of academic staff. Applicants are required to demonstrate performance and achievement in teaching, research and service, which are valued equally. Service includes regional engagement. Regional engagement is perceived as scholarly practice, which derives from teaching and research and through which worthwhile social, civic and professional functions are achieved as academics apply their specialist knowledge and skills to consequential problems in the world beyond the University. Promotions have been made on the strength of applicants' regional engagement.

facilitators also needs to include the following know-how aspects: *a)* management of change; *b)* building and managing networks; *c)* facilitation and mediation; d) working with different organisational cultures; *e)* project planning and implementation; *f)* raising financial support; *g)* supervision and personal support techniques; and *h)* organisational politics and dynamics. These facilitators can mobilise the higher education institutions individually and collectively to a dialogue about the regional role of higher education. (OECD, 1999).

Collaboration between higher education institutions

Regional engagement of higher education requires co-operation and also division of tasks between the individual institutions. An important aspect of governance is that of co-ordination among higher education institutions and promotion of a "common higher education vision" to policymakers. While co-operation between higher education institutions allows for critical mass and provision of more diverse services, the intensity of collaboration remains uneven. Co-operation has thrived in some countries such as the United Kingdom leading to successful initiatives (see Knowledge House in Chapter 5). Although competition for funding has sometimes slowed down the development of inter-institutional collaboration, the trend has been encouraged by central government measures and the awareness of the benefits that can be drawn from speaking with one voice to regional agencies. Some regions have a longer history of collaboration among higher education actors and/or stronger "social capital". However, in many countries and regions, due to a lack of funding, weak interest and/or difficulty to agree on a clear division of tasks, clustering of higher education institutions and inter-institutional co-operation remains limited.

The current OECD study suggests that connectivity often needs to be planned and the local or central government can lay the groundwork for such initiatives. In this regard, there are two main types of programmes: *a)* experimental initiatives targeting a broad set of issues but requiring some level of inter-institutional co-operation or *b)* more specific programmes designed to counter the fragmentation of the tertiary education system in certain countries and as a consequence to remedy its weak ability to collaborate with the private sector. Also supra-national organisations, such as the European Union, have facilitated this type of work (see Box 8.3).

Closer higher education collaboration may require an establishment of a one-stop-shop to systematise regional engagement. This joint liaison office would have a matchmaking, co-ordination and quality assurance role and would provide a visible and single access point to the resource base of the higher education institutions in the region (see Box 5.4 in Chapter 5). Less

Box 8.3. **Regions of Knowledge**

In the EU, the Regions of Knowledge pilot initiative, introduced in the 2003 Community budget by the European Parliament, aims to support experimental actions at the regional level, to improve co-operation between universities and research at this level and to stimulate the integration of regions in Europe. The indicative budget for this initiative is a modest EUR 2.5 million which shows that it is mainly focused on facilitation and organisational issues (setting up networks). Within this framework, the University Driven Actions for Regional Development (UDARD) focus on the capacity of higher education institutions to provide expertise; to perform an advisory role for local companies and public institutions; to stimulate technology-creation and uptake by creating spin-off companies and incubators in a regional, trans-regional, and trans-national context.

radical option would be setting up a first-stop-shop, *i.e.* separate, but co-operating liaison offices in each higher education institution.

In some countries higher education institutions have made tentative steps to address the challenge of closer co-operation by establishing regional associations of higher education institutions. These have been based on initially top-down initiatives as in the United Kingdom where higher education regional associations have been established. The Öresund University is an even more ambitious association insofar as it transcends national boundaries and brings together higher education institutions in both Denmark and Sweden (Box 8.4).

Universities for the North East England and Öresund University both have their own support staff funded by subscriptions from the member higher education institutions and/or overheads charged on collaborative projects. They are characterised by *a)* pragmatism based on incremental approach to facilitate capacity building in complex situations with many stakeholders each with different short term targets; *b)* relationship maintenance to guarantee system management; *c)* long-term commitment to provide the groundwork for more strategic management of the human capital system; and *d)* external linkages which can be used to revitalise the partnership to sustain the momentum. They have a valuable role in representing the higher education institutions collectively to regional stakeholders. Nevertheless, they remain associations and their chief executives are not empowered to commit individual institutions beyond the collaborative operational projects that they have collectively signed up to. Core areas of teaching and research where the institutions often compete are "off limits". Major investments in structural

Box 8.4. **Higher education regional associations supporting regional development in the North East of England and Öresund region**

Higher Education Regional Associations (HERAs) were created in England as a means of encouraging research, teaching and access at regional scale. HERAs are increasingly seen as brokers for the allocation of funds for HEIF and linking learning networks in regions. In England, *Universities for the North East (Unis4NE)* is the oldest higher education regional association in England. Its precursor the Higher Education Support for Industries in the North was founded in 1983. Unis4NE works for the universities in the region, the Open University being an affiliate. Its board is made up of the Vice Chancellors of the higher education institutions. By virtue of the funds that it handles including the throughput of Knowledge House, its budget exceeds that of each of the other eight regional associations in England, despite being the smallest in membership. Unis4NE has several committees playing a brokerage role in collaboration between higher education sector and the region. These include Sports Committee, Culture Committee, Knowledge House, Aim Higher, Health Committee, Music Committee, European Committee, Research and Knowledge Committee and Academic Development Committee. It also serves as a vehicle for join resource bids for example to Whitehall, HEFCE or the European Union.

The Öresund University alliance was established at the time of the opening of the Öresund Bridge. It is led by Lund and Copenhagen universities and involves 12 other institutions of higher education in both Denmark and Sweden. The 14 universities (150 000 students) regrouped in the Öresund University Association aim to work together to consolidate the cross-border region, enhancing its dynamics, setting up sectoral organisations and organising forums and training for regional clusters. It is a mechanism for co-operation and interface between industry and society and a way of branding and enhancing the attractiveness of this cross border region. The alliance encourages the development of joint teaching programmes and research projects, PhD co-operation and student mobility. It supports networking university services (*e.g.* International offices, libraries, European funding, student counselling, marketing) as well as networks with regional authorities. The alliance also supports the Öresund Science Region, an umbrella organisation and incubator for a number of regional industrial clusters facilitating organisations and projects. It seeks to foster networking amongst researchers and firms, provide strategic advice to business and government, to contribute to branding and inward investment, promote new technologies, spin offs and the diffusion of innovation.

change such as new research institutes, teaching programmes and property have to be dealt with directly between the individual institutions and external stakeholders be they regional or national.

Mapping, monitoring and evaluating engagement

The collective working of higher education institutions for the region requires a systematic mapping and monitoring of the regional and external links in terms of teaching, research and third stream activities. Higher education institutions should establish collective mechanisms to track students' origins and destinations on a longitudinal basis including their careers as alumni and use this intelligence to guide the shaping of academic programmes. Similarly, the geography of the collaboration with the users and beneficiaries of research and the contribution of the higher education institutions to regional public affairs (staff participating in politics, the media, the voluntary sector, the arts and culture and other educational institutions) should be mapped. Documenting the present linkages and publicising them within the region and within the institutions itself will raise the profile of higher education as region builder (OECD, 1999).

This mapping should be followed by a self-evaluation of the higher education institutions. The template guiding the self-evaluation process of the current OECD study asked higher education institutions to critically evaluate with their regional partners and in the context of national higher education and regional policies under four major headings, *i.e.* contributions under research to regional innovation; the role of teaching and learning in the development of human capital; contributions to social, cultural and environmental development; and contributions to building regional capacity to act in an increasingly competitive global economy (Annex A). The regions and their higher education institutions which participated in the current OECD review project have – depending on the regional and national context – benefited from enhanced partnership working in the regional strategy process and implementation, generation of new funding streams from the local businesses, stronger branding for the institution(s) and the region and greater impact on national policies.

In most countries, there is no formal process of monitoring the outcomes and assessing the impact of the policies linked to the regional engagement of higher education institutions. In the United Kingdom, some Regional Development Agencies have set up regular programmes of strategic meetings between agency directors and vice chancellors of universities in order to regularly assess the progress made. In addition, the central government assesses some aspects of regional involvement through annual report in its HEIF funding from each university and through the annual collection of data on business and community engagements. In Finland and Sweden, knowledge

institutions have been mapped in certain regions including evaluation of knowledge infrastructure. There has, however, been a number of evaluations and studies about limited aspects of regional engagement often identifying good practices. For example, Finland has a systematic evaluation template for the regional impact of polytechnics, and evaluations are carried out at regular intervals.

With regard to the policy support to technology transfer or creating networks, the evaluations refer to the number of business ideas screened and to the number of development products generated, but also stress the need for complementary initiatives. In the case of business start-ups, incubators and science parks, indicators include the capacity of the programme to establish large partnerships and to gain access to private funds, which are usually intended to take over public funds after a few years. The number of higher education institutions involved in the enterprise and job formation is often quoted as elements of success. More sophisticated analysis, such as using questionnaires addressed to customers or cost benefit analysis of programmes, is rare. Evaluation practices seem more widely spread in some countries than in others *e.g.* Germany, Finland, Sweden, the United Kingdom or the United States. In the UK, the Higher Education and Business Community Interaction Survey provides a number of indicators on research collaboration, consultancy, intellectual property exploitation, spin-off firms, study engagement and participation in regional partnerships. The survey published in 2005 notes an improvement in the quality of interaction between university and business. 89% of universities are now offering a single point of enquiry for business and 79% are assisting SME to identify what resource they need. There has also been an increase in job creation as a direct result of university spin-offs.

There is a need for higher education institutions to collectively construct an overall monitoring and evaluation system, covering all the regional development issues. This has to be supported by coherent and informative systems of indicators for the measurement of the regional contribution of institutions. The system should be able to gather information at the organisational level, the institutional level and the regional level.

Regional higher education systems

There is a marked difference between OECD countries in how higher education systems are steered at the regional and national level and what weight is given to the regional dimension.

For example, in the more market-oriented systems there is an increasing tendency to expect higher education institutions to be entrepreneurial, to create partnerships and raise funds from many sources,

especially the private sector and private fees. This may encourage them to work closely with regional partners, possibly across all sectors, to diversify income streams. On the other hand it may militate against regional engagement which does not promise obvious profit. *Pro bono* public good may have little chance when balancing the books is the principal imperative. Thus regional engagement and development may stand in opposition to and be disadvantaged by the new entrepreneurialism. However, by setting priorities and channelling public funds, central governments can incentivise and persuade some or all higher education institutions to make regional development an attractive part of their central business – for example as a means of widening access to higher education or engaging with SMEs.

A critical choice for governments and higher education institutions is where and how in a mass system diversification takes place. One option is to expect most institutions to undertake all forms of academic activity including research, teaching and community service. Another is to designate some as mainly or only teaching institutions and to concentrate research in a few "world class" research-intensive institutions that enjoy much higher status. Many countries are striving to create world-class centres of excellence. In the global research context, building a world-class international centre of excellence is a difficult challenge for an individual country let alone individual institutions. The bias towards cutting-edge science needs to take account of the evidence that most innovation is incremental in character and also relies on non-scientific knowledge such as design, marketing and tooling-up. A balance therefore needs to be achieved between supporting basic and applied research within each major region of a country. Research, teaching and regional development feed one another and need to go together in a virtuous development cycle.

Extensive and flexible diversification among higher education institutions may provide countries with a wider capacity to address varied national and regional needs. The solution to a dichotomy between world-class research and heavily engaged regionally oriented institutions, however, lies in developing regional higher education systems in which there is strong interdependency, with role specialisation. All institutions are then made responsible together for meeting agreed and required targets across research, teaching and community service roles. Open regional network systems are a logical deduction from the needs, problems and pressures in the regions. Effective regional development, especially in terms of a labour market with fast-changing skill needs and mobile populations, requires a repertoire of youth and adult learning opportunities with functioning pathways and co-operation, not a disjointed set of provisions.

The regional pillar

Building regional partnerships

Successful partnerships between higher education and the region cannot be built on one pillar. They will also depend on regional leadership and collaboration. A key feature of the methodology developed in this OECD review was the establishment of a regional steering committee composed of higher education institutions and a wide range of regional stakeholders. In some regions this was already in place, for example Busan and Jutland-Funen but often with a focus on one aspect of the development process, usually business innovation.

Populating and finding a chair for a new grouping can be problematic where the leadership in the public and private sector is weak. Higher education leaders are often confronted with a multiplicity of regional agencies and partnership structures requesting their input and specific outputs in return for time-limited funding. There can be tensions between different parts of the region, between different agencies and even within single agencies which have multiple objectives – for example in a local authority between town planners required to conserve historic buildings and those charged with encouraging new investment. The fragmentation of local government, the issues of who speaks for the private sector and the role of different parts of central government in the region are common issues.

The same general point holds in federal systems, whether the province or state is also the region or the region is a smaller or larger entity than the political region. In all cases the region may have the potential to function more or less well, depending on a variety of issues such as history and path dependency, the rationality of its geography, economy, political life and setting and personnel.

In Canada the Atlantic Canada Opportunities Agency (ACOA) is a regional development agency that reconciles central financing and accountability with regional control. Its unique character lies in its position within Canada's government structure. It has direct access to the upper echelons of political power while at the same time ensuring its autonomy as a regional agency (Box 8.5).

Whatever the space to manoeuvre, resources and degree of devolution, it is essential for the region to create the means whereby its governing and administrative duties and opportunities can be exercised well, with horizontal communication as well as effective links to local authorities. In some countries there is a long tradition of regional government; in others the attempt to devolve powers is very new. Elected and appointed personnel have to learn to assume responsibility, liaising across the region's different

Box 8.5. **Atlantic Canada Opportunities Agency (ACOA)**

Founded in 1987, ACOA is the principal instrument of the Canadian Federal Government for promoting the economic development and entrepreneurial culture in the Atlantic Provinces. It is a separate ministry with its own responsible minister – elected from the region – ensuring that the region's voice is heard in Cabinet. Its status allows it to develop distinct policies adapted to the region with high degree of flexibility. ACOA's head office is located in the region where final decision-making power resides, advised by a local board, in accordance with the normal rules of ministerial consent and parliamentary accountability.

ACOA aims to make more people aware of opportunities for business creation and support, thereby helping to increase both the rate of small business formation and their likelihood of success. It offers programmes and services for futures entrepreneurs, business owners and managers, non-commercial organisations, communities and higher education institutions throughout the region. Education is seen as an important means of developing entrepreneurial skills and changing mindsets. ACOA has created programmes aimed at schools and higher education institutions.

ACOA's longevity has allowed it to experiment and to establish its credibility as an essential partner across the region. A number of measures have been developed over the years to increase the contribution of higher education institutions to regional development. These include the Atlantic Innovation Fund which has proven to be a key catalyst in encouraging partnerships among businesses and the research community, including higher education institutions. The Export Internships for Trade Graduates programme is another initiative involving higher education institutions. The Agency, in partnership with Atlantic Canadian post-secondary institutions, places university students who have completed formal training in the area of trade with companies actively pursuing new export markets. The programme provides hands-on, trade-related work experience for students, while contributing to the export performance of the region by providing SMEs with in-house trade expertise. ACOA also works with universities in the region to support their international recruitment efforts, and is considering ways of strengthening the role that the higher education institutions in the region play with regard to immigration and the retention of international students.

portfolios but also managing changing relations with central government. In short higher education's contribution to regional development requires effective regional governance. Without this, the full potential of higher education will not be realised.

Regional strategies

One way of tackling these challenges is through the preparation of overarching regional development strategies which focus on regional strengths and opportunities and address weaknesses and threats and which highlight the role higher education can play.[2] In several regions participating in the OECD study such as the Atlantic Canada and the North East of England research groups within the higher education institutions have played a key role in shaping strategies which embrace the contribution of higher education. Such strategies usually cover business, people and places and highlight the contribution that higher education can make in each of these areas. Specific action lines include:

- knowledge creation through research and its exploitation (spin-outs, intellectual property rights, business advisory service);
- knowledge transfer via teaching (worked-based learning, graduate recruitment, professional development/continuing education);
- cultural provision and campus development contributing to vibrant places that attract and retain creative people;
- social inclusion embracing different communities (urban, rural, ethnic);
- marketing the region nationally and internationally (via student recruitment, research links, alumni linkages, conference activity);
- sustainability.

Strategies and regional plans need to elaborated as a shared task between governments, higher education institutions, research centres and the business sector. This should translate into better links between the expertise of the higher education institutions and the strategic priorities of the region. It could also coalesce various sectoral plans often designed at the regional level (technology, health, labour market, etc.). Some regions have initiated such approaches, but many are still inactive. The strategic plans should help to diagnose comparative advantages and to build vision based on dynamics of local and regional economies. They should be transparent with regard to the stakeholder's commitment. They would contribute to shape different roles of higher education institution, including but not restricted to technology issues. While research intensive universities often give insufficient priority and investment to activities that are not technology or R&D intensive (*e.g.* service related activities), environmental management, tourism, transport services, culture, sport and leisure can offer new possibilities for higher education institutions to develop joint activities with the business sector. Related action plans should be prepared specifying individual tasks, responsibilities, timelines, resources and performance measures if they are to drive the

Box 8.6. **Examples of strategic co-operation in regions**

Strategy making: In the Netherlands, the Innovation platform Twente, originally established by the Province of Overrijssel and Network City Twente, involves representatives from industry, local governments and major higher education institutions contributing to the development of the region. It elaborates a vision for an innovative Twente region and publishes a delivery plan. It has identified key innovative actors and projects that could be harnessed to boost innovation in five key domain clusters. The delivery plan aligns funding from municipalities, the province, the RDA behind existing activities and should help to develop more of integrated multi agents projects across the five regional clusters.

Building infrastructure for collaboration. In Denmark, in the wake of the local government reform that came into effect in 2007, Regional Growth Forums have been established with representatives from the newly created regions, municipalities, local trade and industry, the institutions of education and research and the parties of the labour market. Regional Growth Forums are expected to monitor local and regional opportunities for growth and to formulate regional development business strategies which can be fed in into the development plans of the regional councils. The success of this reform and the forums is dependent on the financial resources that will be devoted to the new regions and to their ability to influence national and local policy making.

Joint strategies. In Finland, the Ministry of Education has requested higher education institutions to jointly devise regional strategies for areas that are larger than a municipality or a county (*maakunta*). At the same time each regional council elaborate a four year regional programme for its *maakunta*. Though higher education does not belong to the matters governed by the regional development legislation, *the maakunta* specific implementation plans list a number of expectations regarding universities and polytechnics.

regional agenda forward, be accountable and be comprehensively evaluated on a regular basis.

Putting the bridge in place

Funding conjoint action

Many national systems have allocated limited resources to the regional engagement of higher education institutions. There are, however, some national initiatives which have been set up to drive the regional agenda of higher education. Examples of top-down initiatives involving central government thrust include the US University Centre Programme, the

Canadian Federal Government's Atlantic Innovation Fund which supports universities in the four Atlantic provinces seeking to undertake R&D projects with local businesses (Box 8.7) and the already mentioned Korean New University for Regional Innovation Fund (NURI). (See Chapter 3, Box 3.1.)

Box 8.7. **Central government initiatives supporting the regional agenda of higher education institutions**

In the United States, the Economic Development Administration, EDA (US Department of Commerce) launched long ago a *University Centre Programme* which aims to partner with higher education institutions to improve the economies and economic development capacities of their service areas with emphasis on economically distressed communities. The programme funds proposals for a three year period with most regional offices providing funding on a year to year basis depending on performance and the availability of funds. University centre projects provide management and technical assistance services to communities, counties, districts, non profit development groups and technology transfer assistance to firms. The programme co-finances 69 centres housed by universities in 45 States and Puerto Rico with a budget of USD 7.7 million. A recent evaluation has examined a number of programme features, including centre effectiveness, distressed-area targeting, and utilisation of university resources.

In Canada, the Atlantic Investment Partnership was announced in 2000 as a five-year, CAD 700 million initiative delivered by ACOA and designed to build new partnerships that will increase the capacity of Atlantic Canadians to compete in an increasingly global, knowledge-based economy. Through the Atlantic Investment Partnership, the Government of Canada targeted major investments in the areas of innovation, community economic development, trade and investment, and entrepreneurship and business skills development. The main component of the overall initiative was the CAD 300 million *Atlantic Innovation Fund* which is designed to strengthen the economy of Atlantic Canada by accelerating the development of knowledge-based industry. The Atlantic Investment Partnership was renewed in 2005 for another five-year period with a similar level of funding and with the Atlantic Innovation Fund remaining as its main programme element. The AIF has proven to be a key catalyst in encouraging strong partnerships among businesses and the research community including higher education institutions. Its objectives are to: *a)* build capacity for innovation and research and development (R&D) that leads to technologies, products, processes or services that contribute to economic growth in Atlantic Canada; *b)* increase the capacity for commercialisation of R&D outputs; c*)* strengthen the region's innovation capacity by supporting research, development and commercialisation partnerships and alliances

Box 8.7. **Central government initiatives supporting the regional agenda of higher education institutions** *(cont.)*

among private sector firms, universities, research institutions and other organisations in Atlantic Canada; and *d)* maximise the region's ability to access national R&D funding programs. The Atlantic Innovation Fund focuses on R&D projects in the area of natural and applied sciences, as well as in social sciences, humanities, arts and culture. Assistance is provided to eligible projects, specifically up to 80% of total eligible cost for non-commercial projects and up to 75% of total eligible costs for commercial projects. Contributions to the private sector are conditionally repayable based on commercial success. Contributions to non-commercial organisations such as research institutes in universities, are non repayable.

In most countries the absence of national funding supporting regional engagement of higher education institutions places greater onus on regional stakeholders, drawing on national and international resources where appropriate. One possible solution would be the creation of a single pot of public funding contributed to by a range of stakeholders which higher education institutions could draw on against an agreed set of deliverables which are regularly monitored. Not all higher education institutions in the region would be expected to do everything. Rather they could select from a portfolio of programme possibilities to suit their own missions and academic profile. In many instances programmes are, however, likely to transcend several institutions and modes of engagement (teaching as well as research) and may require the establishment of Special Purpose Vehicles to ensure delivery. Such local actions may persuade national ministries of education who have laid external engagement duties on higher education institutions without appropriate support to enter into match funding arrangements.

Accountability and impacts

Working in partnership for regional development requires: a win-win situation, the capacity to commit to specific short-term decisions with a clear product and delivery date and sustainability, institutional memory supported by modern knowledge management system that transcends changes of personnel and policy orientation, and formal arrangements for evaluation and programme enhancement.

One of the challenges of partnership working is that of accountability. Each of the partners in the higher education/regional development nexus have different accountabilities and expectations. Job generation and

placemaking is not a responsibility of higher education, nor is higher education a responsibility of local government and only in certain countries of regional government. Impacts of engagement are difficult to measure. It is virtually impossible *ex post* to determine how much any improvement in regional economic performance or reduction of inequalities is due solely to interventions by higher education institutions working in partnership with regional agencies.

Notwithstanding the difficulties in measuring impacts, there is a need to invest in a rigorous machinery to undertake baseline analyses specifically designed by partners to address regional weaknesses, build on strengths, contain threats and exploit opportunities. Baseline studies need to be followed by regular monitoring of outcomes. This process will require external peer review. It will require input from all of the stakeholders to ensure their individual accountabilities are taken care of in the analyses.

Realising the potential of higher education to contribute to regional development

The preceding discussion has implicitly accepted a network model for moving towards higher education and regional development systems. It has not advocated a centralised steering approach whereby the national government directs individual higher education institutions to undertake particular tasks in specific locations. Nor for reasons partly related to the problem of appropriate metrics has a market driven model based on performance or output measures been proposed. Rather the emphasis has been on a bottom-up approach of collaborative working where all the partners appreciate the mutual benefits of coming together. Insofar as steering occurs the approach favoured has been of peer learning through sharing of good practice.

To succeed such regional collaboration needs a national framework consistent between the domains of higher education and territorial development which facilitates or permits conjoint action at the sub-national level. There is some evidence that national governments are moving away from strictly prescribing tasks for regional or local governments and what higher education institutions should do where. Movements towards greater direct participation of citizens and businesses in the affairs of state locally and nationally and in the co-production of knowledge are reinforcing these tendencies and thus assisting with the building of bridges between regional institutions and higher education institutions. While the extent of local and regional empowerment and the extent to which it embraces higher education vary significantly from country to country, without this empowerment it is difficult to see how the potential for higher education institutions to actively

contribute to regional development can be realised. With the right conditions regional engagement can become a crucible within which more dynamic and open higher education institutions can be forged, both responding to and shaping developments in the wider society.

Notes

1. These centres include the Centre for Higher Education Policy Studies (CHEPS) at Twente University, the Centre for Urban and Regional Development Studies (CURDS) at Newcastle University (North East England), the Leslie Harris Centre of Regional Policy and Development at Memorial University (Newfoundland, Atlantic Canada), the Institute for Sustainability Health and Regional Engagement (iSHARE) at the University of the Sunshine Coast, and the Centre for the Study of Higher Education Management (CEGES) at the Technical University of Valencia.
2. Higher education institutions are well placed to provide regions and communities with numerous services. They have the expertise to analyse future challenges from a multidisciplinary perspective and identify policy options and scenarios for the future. They are a reservoir of ideas and innovations and can be valuable contributors to the regional development policy process. While foresight and visioning exercises are mainly used at the national level, it has only started in some countries to trickle down to regions and sub-regions.

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Bibliography

Agarval and Henderson (2002), "Putting Patents in Context: Exploring Knowledge Transfer from MIT". *Management science*, January 2002.

Aghion P. and P. Howitt (1998), *Endogenous Growth Theory*, The MIT press, Cambridge.

Arbo, P. and P. Benneworth (2007), *Understanding the Regional Contribution of Higher Education Institutions: a Literature Review*, OECD Education Working Paper, No. 9, OECD, Paris, *www.oecd.org/edu/workingpapers*.

Asheim, B. and M. Gertler (2005), "The Geography of Innovation", in J. Fagerberg *et al*. (eds.), *Oxford Handbook of Innovation*, Oxford University Press, Oxford.

Audretsch, D. B. and M.P Feldman (1996), "Innovative Clusters and the Industry Life Cycle", *Review of Industrial Organization*, Vol. 11, No. 2, pp. 253-273.

Bachtler, J. (2004), "Innovation-led Regional Development: Policy Trends and Issues", Paper presented at the OECD Conference on Innovation and Regional Development: Transition Towards a Knowledge-based Economy. Florence, Italy, 25-26 November 2004.

Bélanger, P. (2006), "Concepts and Realities of Learning Cities and Regions", in C. Duke, L. Doyle and B. Wilson (eds.), *Making Knowledge Work. Sustaining Learning Communities and Regions*, National Institute of Adult Continuing Education (NIACE), Asford Colourpress, Gosport.

Bender, T. (1988), Introduction in Bender, T. (ed.), *The University and the City, from Medical Origins to the Present*, Oxford University Press, New York/Oxford, pp. 3-10.

Best, M. (2000), "Silicon Valley and the Resurgence of Route 128: Systems Integration and Regional Innovation", in J. Dunning (ed.), *Regions, Globalization, and the Knowledge-Based Economy*, Oxford University Press, Oxford.

Binks, M (2005), *Entrepreneurship Education and Interactive Learning,* National Council for Graduate entrepreneurship (NCGE) Policy Paper No. 1, *www.ncge.org.uk/downloads/policy/Entrepreneurship_Education_and_Integrative_Learning.doc*.

Birch, D. L. (1987), *Job Creation in America: How Our Smallest Companies Put the Most People to Work*, Free Press, New York.

Brennan, J., R. Naidoo (2007), "*Higher Education and the Achievement of Equity and Social Justice*" *in* Higher Education Looking Forward (HELF), European Science Foundation: Forward Look, forthcoming.

Brunner, J. J., P. Santiago, C. García Guadilla, J. Gerlach and L. Velho (2006), *OECD Thematic Review of Tertiary Education. Mexico. Country Note*, OECD, Paris, *www.oecd.org/dataoecd/22/49/37746196.pdf*.

Brusco, S. (1986), "Small Firms and Industrial Districts: The experience of Italy", in D. Keeble and E. Wever (eds.), *New firms and regional development in Europe,* Croom Helm, London, pp. 184-202.

Burt, R. (2002), "The Social Capital of Structural Holes", *New Directions in Economic Sociology*, Russel Sage, New York.

Christensen, JL., B. Gregersen and A. Rogaczewska (1999), "Vidensinstitutioner og innovation" (Knowledge Institutions and Innovation), DISKO project, Report No. 8, Erhvervsudviklingsraden (Council for the Development of Economic Life), Copenhagen.

Centre for Urban and Regional Development (CURDS) (2005), *OECD Territorial Review of Newcastle and the North East*, OECD, Paris.

Clark, B. R. (1998), *Creating Entrepreneurial Universities: Organizational Pathways of Transformation*, Pergamon-Elsevier Science, Oxford.

Clark, (2006), OECD, *Thematic Review of Tertiary Education. Country Report: United Kingdom*, OECD, Paris, *www.oecd.org/dataoecd/22/3/37211152.pdf*.

Cook, P. (2004), "University Research and Regional Development", European Commission, Research Director-General.

Coulombe, S., J.-F. Tremblay and S. Marchand (2004), "Literacy Scores, Human Capital and Growth Across 14 OECD Countries", *Statistics Canada*, Ottawa.

Council of Europe (2006), *Declaration on Higher Education and Democratic Culture: citizenship, human rights and civic responsibility*, Strasbourg, 22-23 June 2006, *http://dc.ecml.at/contentman/resources/Downloads/Declaration_EN.pdf* (accessed January 2007).

Crawford, E., T. Shinn and S. Sörlin (1993), "The Nationalization and Denationalization of the Sciences. An introductory essay", in E. Crawford, T. Shinn and S. Sörlin (eds.), *Denationalizing Science. The Contexts of International Scientific Practice*, Kluwer, Dordrecht.

Davies, J., T. Weko, L. Kim, and E. Thustrup (2006), *Thematic Review of Tertiary Education: Finland Country Note*, OECD, Paris, *www.oecd.org/dataoecd/51/29/37474463.pdf*.

Department for Culture, Media and Sport (DCMS) (2006), *Developing Entrepreneurship for the Creative Industries. The Role of Higher and Further Education*, DCMS, London.

DfES, DTI, DWP, HM Treasure (2003), *21st Century Skills: Realising Our Potential (Individuals, Employers, Nation)*, The Stationery Office, London.

Drabenstott, M. (2005), *Review of the Federal Role in Regional Economic Development*, Federal Reserve Bank of Kansas City.

Etzkowitz, H. and L. Leydesdorff (2000), "The Dynamics of Innovation: from National Systems and 'Mode 2' to a Triple-Helix of University-Industry-Government Relations", *Research Policy*, Vol. 29, No. 2, pp. 109-123.

Felsenstein, D. (1996), "The University in the Metropolitan Arena: Impacts and Public Policy Implications", *Urban Studies*, Vol. 33.

Florida, R. (2002), *The Rise of the Creative Class and How It's Transforming Work, Leisure, Community and Everyday Life*, Basic Books, New York.

Florida, R. (2005), "The World is Spiky", *Atlantic Monthly*, Boston.

Forum for the Future (2006), Forum for the Future website, *www.forumforthefuture.org.uk*, accessed 12 January 2007.

Friedman, T. (2005), *The World is Flat: A Brief History of the Twenty-First Century*, Farrar, Straus and Giroux, New York.

Fundación Conocimiento y Desarrollo (2005), *Informe CYD 2005: La contribución de las universidades españolas al desarrollo*, Fundación CYD, Barcelona.

Gertler, M. and T. Vinodrai, (2004), Anchors of Creativity: How Do Public Universities Create *Competitive and Cohesive Communities*?, Department of Geography, University of Toronto.

Gibb, A. (2005), Towards the Entrepreneurial University: Entrepreneurship Education as a Lever for Change.

Gibbons, M., C. Limoges, H. Nowotny, S. Schwartzman, P. Scott and M. Trow (1994), *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*, Sage, London.

Goddard, J., D. Charles, A., Pike, G. Potts and D. Bradley (1994), *Universities and Communities: a Report for the Committee of Vice-Chancellors and Principals*, Centre for Urban and Regional Development Studies, Newcastle University, Newcastle.

Goddard, J. B. and P. Chatterton (2003), The response of universities to regional needs, in F. Boekema, E. Kuypers, R. Rutten (eds.), *Economic Geography of Higher Education: Knowledge, Infrastructure and Learning Regions*, Routledge, London.

Goddard, J. B. (2005), "Supporting the Contribution of HEIs to Regional Developments Project Overview", Paper presented to OECD/IMHE Conference, Paris, 6-7 January 2005.

Goldstein, H. and M. Luger (1993) "Theory and Practice in High-Tech Economic Development", in D. R. Bingham and R. Mier (eds.), *Theories of Local Economic Development: Perspectives from across the Disciplines*, Sage Publications, Newbury Park.

Grubb, N., H. M. Jahr, J. Neumüller, S. Field (2006), *Equity in Education. Thematic Review. Finland Country Note.* OECD, Paris, *www.oecd.org/dataoecd/49/40/36376641.pdf*.

HEFCE (Higher Education Funding Council for England) (2006), *Widening Participation: a Review*, Report to the Minister of State of Higher Education and Lifelong Learning by the Higher Education Funding Council for England, *www.hefce.ac.uk/widen/aimhigh/review.asp*.

Innovation Associates Inc. (2005), *Accelerating Economic development through University technology Transfer*, based on Report to the Connecticut Technology Transfer and Commercialization Advisory Board of the Governor's Competitiveness Council, *www.innovationassoc.com*.

Joaquin B.J, P. Santiago, C. García Guadilla, J. Gerlach, L.Velho (2006), *Thematic Review of Tertiary Education: Mexico Country Note*, *www.oecd.org/dataoecd/22/49/37746196.pdf*.

Kaldor, N. (1970), "The Case for Regional Policies", *Scottish Journal of Political Economy*, Vol., 17, No. 3, pp. 337-348.

Kline, S. J. and N Rosenberg (1986), "An Overview of Innovation", in R. Landau and N. Rosenberg (eds.), *The Positive Sum Strategy: Harnessing Technology for Economic Growth,* National Academy Press, Washington, D.C., pp. 275-304.

Laursen, K and A. Salter (2003), "The Fruits of Intellectual Production: Economic and Scientific Specialisation among OECD Countries", Paper No. 2, Danish Research Units for Industrial Dynamics, University of Aalborg, Aalborg.

Lawton Smith, H., J. Glasson, J. Simmie, A. Chadwick and G. Clark (2003), *Enterprising Oxford: The Growth of the Oxfordshire High-tech Economy,* Oxford Economic Observatory, Oxford.

Lester, Richard K. (2005), *Universities, Innovation, and the Competitiveness of Local Economies: A Summary Report from the Local Innovation Systems Project–Phase I*. MIT IPC Local Innovation Systems Working Paper 05-005 | IPC Working Paper 05-010, *http://web.edu/lis/papers/LIS05.010.pdf*.

Locke, W., E. Beale, R. Greenwood, C. Farrell, S.Tomblin, P-M. Dejardins, F. Strain, and G. Baldacchino (2006), *OECD/IMHE Project, Supporting the Contribution of Higher Education Institutions to Regional Development, Self Evaluation Report: Atlantic Canada*, *www.oecd.org//17/12/37884292.pdf*.

Lundvall, B. Å. (ed.) (1992), *National Systems of Innovation: Towards a theory of Innovation and Interactive Learning*, Pinter Publishers, London.

Lundvall B. Å. and S. Borrás (1997), *The Globalising Learning Economy: Implication for Innovation Policy*, The European Communities, Luxembourg.

Malmberg, A. and P. Maskell (1997), "Towards an Explanation of Regional Specialization and Industry Agglomeration", *European Planning Studies*, Vol. 5, No. 1, pp. 25-41.

Martin, F. and M. Trudeau (1998), *The Economic Impact of Canadian University R&D*, AUCC publications, Ottawa.

Martin, R. and P. Morrison (2003), "Thinking about the Geographies of Labour," in R.Martin and S. Morrison (eds.), *Geographies of Labor Market Inequality*, Routledge, London, pp. 3-20.

Mathiessen, Christian Wichman, Annette Winkel Schwarz and Søren Find (2005), *Research Output and Cooperation: Case Study of the Øresund Region: An Analysis Based on Bibliometric Indicators*, University of Copenhagen, Copenhagen.

McClelland, C. E. (1988), "To Live for Science: Ideals and Realities at the University of Berlin", in T. Bender (ed.), *The University and the City. From Medieval Origins to the Present,* Oxford University Press, New York/Oxford, pp. 181-197.

Morgan, K. (1997), "The Learning Region: Institutions, Innovation and Regional Renewal", *Regional Studies*, Vol. 31, No. 5, pp. 491-403.

Myrdal, G. (1957), *Economic Theory and Under-Developed Regions,* Gerald Duckworth, London.

OECD (1999), *The Response of Higher Education Institutions to Regional Needs,* OECD, Paris.

OECD (2001a), *Cities and Regions in the Learning Economy*, OECD, Paris.

OECD (2001b), *Managing University Museums*, OECD, Paris.

OECD (2003a), *Funding of Public Research and Development: Trends and Changes*, OECD, Paris.

OECD (2003b), *OECD Territorial Reviews: Öresund, Denmark/Sweden*, OECD, Paris.

OECD (2003c), "Upgrading Workers' Skills and Competencies", *OECD Employment Outlook,* OECD, Paris.

OECD (2004), *OECD Territorial Reviews: Busan, Korea*, OECD, Paris.

OECD (2005a), *OECD Territorial Reviews: Finland*. OECD, Paris.

OECD (2005b), *Economic Surveys: Korea*, OECD, Paris.

OECD (2005c), *Economic Surveys: Mexico*, OECD, Paris.

OECD (2005d), *Economic Surveys: The Netherlands*, OECD, Paris.

OECD (2005e), *Economic Surveys: United Kingdom*, OECD, Paris.

OECD (2005f), *Reviews of National Policies for Education: University Education in Denmark*, OECD, Paris.

OECD (2006a), "The Contributions of Higher Education Institutions to Regional Development: Issues and Policies", GOV/TDPC(2006)22, OECD, Paris.

OECD (2006b), *Economic Surveys:Australia*, OECD, Paris.

OECD (2006c) *Economic Survey of Brazil*, OECD, Paris.

OECD, (2006d), *Economic Surveys: Canada*, OECD, Paris.

OECD, (2006e), *Economic Surveys: Denmark*, OECD, Paris.

OECD (2006f), *Economic Surveys: Finland*, OECD, Paris.

OECD (2006g), *Building a Competitive City-Region: The Case of Newcastle in the North East*, OECD, Paris.

OECD (2006h), *Skills Upgrading. New Policy Perspectives,* OECD, Paris.

OECD (2006i), *Measuring the Effects of Education on Health and Civic Engagement* (Proceedings of the Copenhagen Symposium), OECD, Paris, available in *www.oecd.org/edu/socialoutcomes/symposium*.

OECD (2006j), *Main Science and Technology Indicators*, OECD, Paris.

OECD (2007a), Supporting the Contribution of Higher Education Institutions to Regional Development, project website, *www.oecd.org/edu/higher/regionaldevelopment*.

OECD (2007b), *Economic Surveys: Sweden*, OECD, Paris.

OECD (2007c), *Economic Surveys: Spain*, OECD, Paris.

OECD (2007d), *Understanding the Social Outcomes of Learning*, OECD, Paris, forthcoming.

OECD (2008), *OECD Review of Tertiary Education. Final Report*, OECD, Paris, forthcoming.

OPDM (Office for Deputy Prime Minister) (2004), *Competitive European Cities, Where Do the Core Cities Stand?*, *www.communities.gov.uk/pub/441/CompetitiveEuropeanCitiesWhereDoTheCoreCitiesStandFullReportPDF444Kb_id1127441.pdf*.

Paytas, J., R. Gradeck and L. Andrews (2004), *Universities and the Development of Industry Clusters. Paper for the Economic Development Administration*, US Department of Commerce, Centre for Economic Development, Carnegie Mellon University, Pittsburg, Pensylvania.

Peck, J. (1996), *Workplace: The Social Regulation of Labor Markets,* Guildford Press, New York and London.

Piore, M. J. and Sabel, C.F. (1984), *The Second Industrial Divide. Possibilities for Prosperity*, Free Press, New York.

Porter, M. E. (1990), *The Competitive Advantage of Nations,* MacMillan, Basingstoke.

Porter, M. E. (1998), "Location, Clusters and the New Economics of Competition", *Business Economics,* Vol. 33, No. 1, pp. 7-17.

Porter, M. E. (2003), "The Economic Performance of Regions", *Regional Studies,* Vol. 37, No. 6/7, pp. 549-78.

Rosenfeld, S. (1998) *Technical Colleges, Technology Deployment and Regional Development*, draft stock-taking paper prepared for the OECD, Regional Technology Strategies Inc, Chapel Hill, North Carolina.

Rothwell, R. and W. Zegveld (1982), *Innovation and the Small and Medium-Sized Firm*. Frances Pinter, London.

Scott, A. and M. Storper (2002), "Regions, Globalization and Development", *Regional Studies*, Vol. 37, pp. 579-593.

Simmie J., J. Sennett, P. Wood and D. Hart (2002), "Innovation in Europe, a Tale of Networks, Knowledge and Trade in Five Cities", *Regional Studies*, Vol. 36, pp. 47-64.

Smith, T and C. Whitchurch (2002), "The Future of the Tripartitite Mission: Re-Examining the Relationship Linking Universities, Medical Schools and Health Systems", *Higher Education Management and Policy*, Vol. 14, No. 2, OECD, Paris.

The Finnish Higher Education Evaluation Council (2006), The Finnish Higher Education Evaluation Council website, *www.kka.fi/english*, accessed 3 January 2006.

Vestergaard, J. (2006), "HEIs and Their Regions – an Innovation System Perspective", paper presented to OECD/IMHE Project Task Group, 10 April 2006, Paris.

Wittrock, B. (1993), "The Modern University: the Three Transformations", in S. Rothblatt and B. Wittrock (eds.), *The European and American University Since 1800. Historical and Sociological Essays,* Cambridge University Press, Cambridge, pp. 303-362.

World Bank Group (2002), *Constructing Knowledge Societies: New Challenges for Tertiary Education, http://www1.worldbank.org/education/tertiary/cks.asp*.

Young, S. and R. Brown (2002), "Globalisation and the Knowledge Economy", in N. Hood, J. Peat, E. Peters and S. Young (eds.), *Scotland in a Global Economy: The 20:20 Vision*, Palgrave Macmillan, Hampshire.

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