4.3 Portuguese Polytechnics and Regional/Rural Development: Lessons from Experience Elsewhere

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4.3.1 Overview

Increasing connectivity and competitiveness in the global economy are changing the nature of regional economic development. The success of regional and rural economies is increasingly dependent on their capacity to compete with innovative products, services and technologies in global markets. Regions must focus on upgrading their human capital and knowledge bases creating a new set of demands on the polytechnic sector for how to work with regional actors strategically to optimise regional performance. The higher education sector has become used to a paradigm of partnership within regions, but emphasis is shifting to how these regional partnerships can create global competitive advantage. Portuguese polytechnics need to adjust where necessary to this new paradigm, and the implications that it brings for HE regional partnerships, to ensure that they contribute to the development of regional smart specialisation in their home territories.

4.3.2 Introduction

Higher education can play an important role in regional and rural development, both in the polytechnic as well as the university sector. With increasing emphasis being placed on knowledge economy, higher education’s role in helping to develop and exploit knowledge capital makes the sector critical drivers for regional development. Since the mid-1990s, it has become commonplace for territorial and HE policy makers to encourage the development of regional innovation strategies, to identify the possibilities for linkages between knowledge producers (HE), and knowledge exploiters (businesses). But there is an increasing recognition that innovation is a global phenomenon, and therefore territorial development relies on building up regional innovation partnerships that have strength in these wider global networks (global-local relationships). The Portuguese Polytechnic sector can best contribute to regional and rural development in Portugal by emphasising this global-local connectivity and helping to develop regional smart specialisation in the Portuguese regions.

The driver for this as been the increased importance of knowledge capital, and the fact that some knowledge (‘tacit’ knowledge or knowhow/ ‘know-who’) is most easily transferred through direct interpersonal contact. Evidence emerged in the late 1980s and early 1990s of the systemic nature of innovation, that is to say that regular co-operations between innovators made the exchange of tacit knowledge easier, leading these co-operative exchanges to have a systemic property. From the mid-1990s, policy-makers have actively
attempted to manage innovators in a region by encouraging system-forming, and in particular mobilising innovators – firms, government, universities and public laboratories – to come together and identify how they might develop better work together to create and exchange new knowledge, particularly in promising growth sectors. The role for higher education was clear, in bringing particular kinds of abstract technological knowledge to the region, and embedding it through knowledge exchange in regional firms through co-creative processes (IRE, 1999). There was a clear if sometimes implicit division of labour in the role for higher education, with polytechnics in these regional innovation strategies usually being responsible for technical consultancy, supply of skilled engineers, and business/entrepreneurship education.

The practical result of this has been a rash of identikit strategies, the idea of ‘Silicon Somewheres’, as all regions have attempted to develop innovation systems based on a very limited number of emerging technologies, from micro-electronics and ICTs to biotech and nanotechnology (Hospers, 2007). Many of the collaborations that have been created have been driven by the availability of public funding, and not related to creating real competitive strengths in those sectors. There is now a recognition that alongside these ‘regional innovation systems’, global innovation takes place in wider, distributed technological innovation systems (TISs) linking through large scale research projects, corporate research activity and government programmes, firms, universities and public research organisations towards advancing the technological frontier at a global scale (Bergek et al., 2008). Regional economic development is therefore dependent on building up a strong RIS which has a well-identified and clear advantage within a global TIS, the wider knowledge production network related to particular goods and technology markets. (Benneworth & Dassen, 2011)

The key challenge for policy makers more generally as well as the Polytechnic Sector more specifically is how to respond effectively and better support regional innovators to compete within the wider globalised knowledge economy. One answer which has been developed and adopted by the OECD and the European Commission is the notion of regional smart specialisation (Foray et al., 2009). Regional smart specialisation takes the idea of the regional innovation strategy and focuses it specifically on developing these global-local connections. The basis for this is a process of ‘entrepreneurial discovery’ where firms and knowledge producers work together to identify the most promising areas of specialisation, and then develop a strategy to optimise their global orientation to exploit their local strengths. The emphasis shifts from creating linkages between partners in regions (e.g. between universities and firms) to identifying where there are missing linkages from regional actors to these TISs, and helping particular regional actors access knowledge in these TISs. At the same time, a key emphasis is focusing on regional strengths and related variety: for those regions which are not strong in biotech, nanotechnology and ICTs, the question is where is the innovation frontier of their strong sectors, and how can regional partners work together to transform these often traditional sectors into innovative and competitive nodes within wider TISs.
4.3.3 Polytechnics contributing to regional smart specialisation

The higher education sector is now comfortable with the idea of contributing to territorial economic development, and creating regional partnerships to help support regional innovators and entrepreneurs. Part of this has come through ‘traditional’ HE activities, such as research and innovation, enterprise and business development, human capital development and social equality (Goddard, 2011). Polytechnics have always trained highly skilled engineers and technicians who develop new products and create new businesses: polytechnics have long worked more systematically with particular key firms to tailor their curricula to firms’ needs, ensure that their students receive useful placements, and to make their facilities and knowledge open to firms.

In the last quarter century, two new roles have emerged for higher education institutions (HEIs) in their regions, as identified in the 2007 OECD report:

- The first is a transforming role – that involves going beyond what firms currently need in terms of innovation, but helping those firms to upgrade their innovative capacity and become more innovative. Polytechnics have developed new incubator units and master class programmes to improve business innovative and growth rates: they have also become involved in more strategic initiatives, such as clusters, growth poles, science parks and technopoles, seeking to create common infrastructures facilitating and encouraging higher levels of interaction.
- The second is a collective leadership role, working with local and regional policymakers, key regional businesses, unions, and the voluntary and charitable sector, to create a common agenda for action to deliver that transformation. Polytechnics may often be amongst the largest employers in regions, particularly in more remote rural regions, and strategically significant in terms of bringing large numbers of students into those regions, as well as large local stakeholder networks, conferring considerable moral authority on them in taking a lead in developing collective plans for change.

- The regular *modus operandi* in the last twenty years – in which Portugal has participated – has been the development of regional innovation strategies (Laranja, 2004). Polytechnics are usually positioned on the ‘supply side’ of the regional knowledge capacity maps, and regional partners have attempted to develop collective and collaborative arrangements to better link the supply and demand sides. A key problem for many regions has been what to do when their regional demand side is very weak and ill-fitted with the supply side, and with regional smart specialisation, this issue moves back to the fore. The challenge of regional upgrading is making these regional industries more innovative, and ultimately to become self-sustainingly competitive. This upgrading necessarily goes beyond applying new technologies in traditional industries – as has been common in the textiles industry, introducing new cutting, designing, logistics and management software to improve productivity. The issue for textiles, as with many other industries, is as employment in Europe declines, how to move the productive base into new technological areas that build on the old strengths of the sector, which might not necessarily be in ‘textiles’ but use the human and social capital in the industrial infrastructure as the basis for developing a competitive position. The key challenge for polytechnics in old industrial regions is how to work with regional partners to avoid lock-in, identify new opportunity sectors, and move...
towards them with the minimum structural disruption possible. And this creates a whole new set of demands on the polytechnic sector.

A key issue for polytechnics in terms of planning their regional and rural engagement activities is the question of balance with other HEIs in their regions, particularly in a formal binary system where there can be questions of legal responsibilities and duties. Ultimately, it does not matter how knowledge comes into a region or how it is embodied in productive innovative activities, and co-operation between universities and polytechnics is most effective when it is managed constructively and seamlessly. The best divisions of labours of HEIs in rural and regional engagement are emergent and strategic, based on the respective talents and opportunities of those polytechnics and universities, the wider networks with which they are embedded, and how that can contribute to upgrading the region’s innovative base. Particular care has to be taken to deal with any implicit vertical differentiation between HEIs (saying that regional engagement is a task for a particular – often subordinate – group of institutions). At the same time, carefully managing this issue helps to ensure that polytechnics do not use a ‘regional mission’ as part of attempts to develop prestigious blue skies research capacity and compete with universities for regional resources.

4.3.4 Concrete examples from around Europe

The most useful contributions which polytechnics can make to regional and rural development – and in particular to smart specialisation processes – are those contributions which promote a substantive regional change or upgrading. Much of the ways that contributions have traditionally been regarded are in terms of serving the needs of business, through the direct requests of businesses. But smart specialisation requires a shift from the ‘business as usual’ strategy, to increasing innovation performance and productivity growth across all sectors of the economy. There are several clear ways in which polytechnics can make this contribution, by supporting the linking of regional actors both within the region as well as with external partners. This role is common to higher education as a sector, and in a vertically differentiated sector, there is also a differentiation in the kinds of linking activities which universities and polytechnics respectively perform. EURADA cites the Goddard Smart Specialisation paper highlighting the wide range of contributions by which HE in general can contribute to smart specialisation processes. This diagram is reproduced below.
This diagram makes a clear contrast between interventions which are transactional as against transformational, and between activities which are simple to those which are more complex to deliver. Many of these activities will take place automatically simply through the presence of the HE actor, although polytechnics can do more to stimulate these kind of activities. In a context of scarce resources, the most important areas on which polytechnics might wish to focus are those in the upper-right hand quadrant of the diagram above. The nature of these activities varies with regional context, and in particular polytechnics in less successful, old-industrial, peripheral or declining regions may encounter particular problems for polytechnics engaging regionally, such as a lack of partner firms and other knowledge institutions, or even of a culture of innovation and collaboration in both public and private sectors. There are five areas where we highlight that polytechnics are able to make a high-impact and distinctive contribution of smart specialisation processes, and present examples from where polytechnics in less successful regions have been able to make upgrading and transformational contributions to their regional environments:

a) **Stimulating innovation (Seinajöki Research and Development)**

The challenge for a Polytechnic in undertaking research is in persuading research funders that it has the competence and knowledge to add value and meet the users’ specific knowledge needs, particularly in dual systems when polytechnics receive no core research funding. Whilst polytechnics may be training students in the latest techniques, there is no requirement for the teaching staff to have a scholarly as well as a pedagogic background. Indeed, in many polytechnic systems it is not a requirement for teachers to have a research qualification (M. Res. or Ph.D.) At the same time, because polytechnics are close to
businesses because of their teaching approaches, and face no pressure to engage in blue-skies research, there is a place for polytechnics in meeting particular kinds of knowledge needs. Finland is one of the countries that has been at the forefront of encouraging its polytechnics to become more engaged in direct knowledge transfer to and knowledge exchange with particularly regional businesses. Polytechnics (Universities of Applied Science) in Finland have a specific legal requirement to promote regional development, not just through delivering training relevant to regional businesses, but also engaging in appropriate research and technology transfer activities.

Seinäjoki University of Applied Sciences (SEAMK) is not atypical example of how polytechnics can move into distinct knowledge creation niches which benefit their regional business base. In 2007, SEAMK created a single unified office for its technology transfer activities (SEAMK R&D) which had previously been split between two offices, one for commerce and technology and the other for social and health care. The SEAMK R&D model is a matrix structure, in which there is a central outward-facing office and specialist technology transfer officers in the faculties. There is therefore a single contact point for business, with expertise in making collaborations work from an administrative perspective, and specialist faculty officers who are sensitive to the different kinds of technology transfer needs in areas as different as Technology, Agriculture & Forestry and Culture & Design. Although there is no blue skies research, a recent evaluation report found that there were activities in applied research, development and consultancy, including work in some international consortia (notably in health care and social work). Research intensity of SEAMK was relatively low (c. €700 per student) in comparison to the university sector, but nevertheless, some staff were active in scholarly activities including conference attendance and journal publishing. An important mechanism for technology transfer comes through student theses, in which they solve a real practice problem, which may include research such as the development of new operational models or an evaluation study. SEAMK works closely with the local University College network to deliver regional development goals

b) Talent retention (Lower Rhine UAS)

Universities are becoming increasingly active in managing their alumni as a useful network for achieving their wider missions, and regional development actors are also interested in the roles that universities can play in dealing with human capital issues. One particular problem for non-core regions is of brain-drain, that of the outmigration of highly skilled migrants. There is a tendency to regard universities as a positive asset for a region, because they create human capital, and may attract students to a region. But the reality for peripheral regions is that universities and UASs may actually serve act to encourage outmigration, in equipping the most talented people in a less-successful region with precisely the skills and the experience they need to leave the region, often to so-called 'escalator regions' where they can accelerate their career development (Fielding, 1992). But at the same time, these emigrants may seek to ‘step off the escalator’ and settle down outside these very busy (expensive and sometimes not necessarily liveable) escalator regions. If HEIs retain connections to their graduates, then they may be able to bring these very highly—skilled migrants back to the region. Regional policy makers are likewise
increasingly turning their attention to the development of smart human capital policies for their HEIs that go beyond seeking to match existing provision and demand.

Gelsenkirchen UAS has been leading a research project to explore what UASs may do in order to achieve this (the BRAND project\textsuperscript{18}). Research carried out within the project has identified that the main variable that influences whether someone will move to a region when faced with a set of choices is whether they feel a sense of attachment and belonging. Therefore HEIs do not really strongly influence their local students, whose sense of attachment and belonging will have been formed long before the study period. The one area where HEIs can make a distinctive contribution is in terms of the group of students that come to the region to study there and then leave. UASs can therefore attempt to ensure that students have a positive experience of their region whilst they are studying there, as well as creating alumni networks that attempt to support that feeling of place belonging, as well as ensuring The Lower Rhine UAS has set up an Alumni\textsuperscript{19} office that operates on two levels – there is a central office informing graduates about developments in and around the university, but also a set of course-specific Associations registered as separate businesses. These each have their own services for students, graduates and businesses, including recruitment workshops, technology transfer, placements, and innovation schemes. One example is to carry course-specific employment opportunities, the idea being to create visibility for jobs in the Lower Rhine region for those that have studied and moved away, as well as for alumni that have stayed in the region, integrating talent retention as one activity within a broader suite of engagement activities.

c) Facilitating clusters (Dutch UASs and the RAAK rule)

Clusters of innovative businesses can be highly useful ways for raising innovation rates and performance, allowing risk-sharing, the development of collective knowledge, economies of scale and opportunities for generating regional specialisation. HEIs can support the development of clusters and support increasing their overall innovation capacity, but where there are large numbers of inexperienced firms, then universities may not be the most useful partners for these firms who require other resources besides scientific knowledge in order to effectively innovate. There is a clear niche for polytechnics in working with clusters of firms in similar sectors with similar needs but without necessarily common high levels of competence in business innovation. These connections come about because the UASs work with these firms to meet their regular skills needs, but also to use those connections to identify common knowledge needs and the kinds of applied research and consultancy which might fill those needs. But the UAS sector is not always well-equipped with the staff who are able to work with firms both to deal with their current needs, but also to think more strategically about upgrading their capabilities for innovation.

Addressing this issue has been at the heart of the Dutch Lectoraat Programme. The idea was created in 2003 as a pilot scheme in which UASs bid for central funding to appoint Associate Professors (Lectoren) in particular fields where the UASs had close connections with groups of businesses, in the public or private sector. These Associate Professors

\textsuperscript{18} http://www.brain-flow.eu/sub-projects/brand.html
\textsuperscript{19} http://www.hs-niederrhein.de/services/alumni/
would then assume responsibility for the UASs’ business development in that sector, and as well as ensuring that the curriculum reflected business needs, develop collective programmes and secure funding for capacity raising activities. The Scheme was managed by the Innovation Alliance Foundation (SIA20). SIA were funded to create an additional finance scheme (RAAK) which makes funds available for users to undertake joint research projects with the UASs. These projects involve Lectoren, networks of firms and public sector organisations, and other knowledge institutions (including universities) where appropriate. In 2008, the experiment was turned into core funding for UASs, reflecting the success of this in creating genuine applied research capacity in the 450 Lectoren working in Dutch UASs.

d) Placemarking and Cultural Development (the Bohemian classes UK UASs)

Since the publication of Richard Florida’s The Rise of the Creative Class (2002), there has been a huge interest in how to use creative industries to drive economic competitiveness, and how to attract the ‘Bohemian Classes’ associated with creativity driven growth. This has been expressed in a new policy paradigm (Evans, 2009), of the creative city, with urban policy makers seeking to initiate new ‘creative quarters’ as places where artists can congregate and produce positive economic impacts. Much of this work has focused on the physical development dimensions that this brings, and attempting to use things like ‘creative factories’ (artists’ studios in derelict industrial buildings) as an engine of gentrification, raising land prices and local tax bases. HEIs have positioned themselves as important players in the creation of these new creative spaces, with Evans citing the following examples (Evans, 2009, p. 46-47):

- “Queensland University of Technology & Brisbane creative precinct and wider south bank regeneration;
- Pobra Fabra (University of Arts & Design) consolidating its six campuses into one mega-development in Barcelona’s Poblenou industrial zone
- Humboldt University and Eagle Yard/Adlershof science & media park and village in former east Berlin,
- Simon Fraser University media campus in Downtown Eastside, Vancouver, and
- Helsinki University of Art & Design, Cable Factory and Arabianranta “virtual urban village”

But ultimately, the success of creative cities does not depend on physical development projects but on the communities and people they house, and their entrepreneurship, drive and risk-taking. Polytechnics are often sources of considerable numbers of ‘Bohemian students’ – the holy grail of creative city strategies - (Comunian & Faggian, 2010) in terms of the numbers of students they have and their disciplinary range. Comunian & Faggian present data from the UK, in which they show that the top nine HEIs in terms of their number of Bohemian Graduates are all former polytechnics (new universities) or arts colleges, together accounting for 24.2% of the UK’s Bohemian Graduate stock (around

20 http://www.innovatie-alliantie.nl/index.php
21 "graduates who obtained a degree in a ‘bohemian’ subject (creative arts, performing arts, design, mass communications, multi-media, software design and engineering, music recording and technology, architecture and landscape design) (Comunian & Faggian, 2010, p. 193).
43,000 students). Together with the physical resources these institutions have for the promotion of arts, culture and the creative industries, polytechnics have a huge capacity to contribute to the growth of the creative sector. The key challenge is in ensuring that these students are connected during their study activities into regional cultural life, and able to cross-fertilise and engage with local cultural and creative industries. Smart management by polytechnics of their course requirements and facilities can greatly contribute to this process, and help to ensure that regions are able to benefit from the tremendous impulse which the creative sector can bring.

e) Community engagement and capacity building (Brighton UAS in the UK)

One final area where UASs can make a substantive different is in terms of the creation of social capital within a region (Putnam, 2000). Social capital refers to the capacity that exists within groups to come together and be able to co-operate to achieve collective goals (bonding capital), but also to get those goals placed onto the agenda of external partners (bridging capital). There can be a particular problem for less successful regions, and UASs can play a role in addressing this. A good mechanism for creating social capital is through volunteering activities, and many universities have opportunities for students to work for or work on a problem for a voluntary and community sector organisation. However, it is possible for HEIs to more systematically contribute to social capital building within regions by managing that engagement activity more strategically. The RAAK programme in the Netherlands (cf. 1.4.3) has a number of collective research projects in which UASs are working with community organisations to stimulate innovation (for example in the use of social media to promote social integration and neighbourliness).

A good example of a polytechnic that has made it a central element of its raison d’être in the University of Brighton (formerly Brighton Polytechnic) and its Community-University Partnership Programme (CUPP) (Hart et al., 2007, Hart & Aumann, 2013). The Vice Chancellor of the University was offered seed funding in 2003 from a philanthropic foundation to undertake an experiment in systematic community engagement, building on the substantial work already underway at Brighton. The CUPP model is to provide an infrastructure by which local community groups can access university knowledge, and in particular recognising that their needs are not always easy for universities to deal with nor important to university staff (Balloch et al., 2007). Two important elements of this were providing access to education, both to people from excluded groups as well as lifelong learning for those working with community groups. A third element was in co-ordinating student projects in order to make them accessible; related to this was the fourth element, a helpdesk, as a single point of contact for voluntary and community sector groups. Following the establishment of the scheme, additional government funding was made available to run projects ranging from scoping studies to substantial research projects involving community groups.