

OECD Review of Higher Education in Regional and
City Development

Catalonia, Spain



Assessment and recommendations

Catalonia: from science and technology push to inclusive and balanced regional development

With more than 7.5 million inhabitants, the Autonomous Region of Catalonia is the second most populous region in Spain, representing 16% of its total population. Catalonia is the main contributor to the Spanish economy with nearly 19% of Spain's GDP. The GDP per capita is higher than the European Union average (EU-27).

The engine of Catalonia's development is Barcelona, which has transformed itself from a declining industrial city into a global gateway and one of Europe's centres for design and biotechnology. Barcelona is a magnet for students, researchers and artists from Europe and abroad, with direct impact on the regional economy.

Catalonia has a diversified economy. Manufacturing and market-related production services account for more than half of the region's employment and GVA. 66.8% of employment is in the tertiary sector, 26% in manufacturing, 10.2% in construction and 2.2% in agriculture. Small and medium-sized enterprises (SMEs) dominate the regional economy.

Productivity (GDP per worker) for Catalonia, like Spain overall, has been slipping relative to the rest of the OECD, decreasing from 115% of the OECD average in 1995 to only 91% by 2005. This has been due to the expansion of a less educated and lower skilled workforce, and the inability of firms in major Catalan industries to move up the value chain via product innovation. Almost two-thirds of manufacturing employment is in medium-low or low-technology industries. Catalonia's manufacturing base is increasingly faced with the pressures of global competition and industrial relocation.

Since 2007, Spain has been severely affected by the global economic crisis. It has the second highest unemployment rate within the EU at 20.4% in the third quarter of 2010. Youth unemployment reached 43.5% in the end of 2009, an increase of 24.7 percentage points since the end of 2007. Unemployment in Catalonia is approximately 16.53%, highest among the young under 24 years (41.2%) and those with low skills. While educational attainment levels have improved in Catalonia in the two last decades, a large proportion of population has low skills and 9.6% of the population is illiterate or without schooling.

To prepare for the post-crisis economy, Catalonia and its universities and other tertiary education institutions in regional development need to address the following challenges:

- How to create jobs, address unemployment and improve the flexibility of the population to face rapid changes in the labour market? How to improve the relevance and quality of education?
- How to transform the economy through upgrading established industries and building new market opportunities? How to strengthen and diversify the existing industries and improve the absorptive capacity of the SME-based economy?
- How to address the socio-economic gaps, needs of the diverse population with a large number of immigrants and a growing number of ageing citizens?
- How to reform the governance and management to unleash the potential of universities for local regional development and greater efficiency and productivity?

In order to slash unemployment and to improve productivity, Catalonia needs to foster human capital development for new and changing jobs. There is a need to balance the current strong focus on talent attraction with nurturing talent at home and by improving the access of new immigrants to tertiary education. Catalonia and its universities need to view job creation as a key goal for innovation and adopt a wide innovation concept beyond science push. At the regional and institutional level stronger incentives for regional engagement could be provided through performance-based funding and “challenge-driven” competitive calls. There is also a need to monitor the rate of return and effectiveness of public investment in research and innovation. Finally, to unleash the full potential of universities in regional and local development, it is necessary reform the university governance in Spain, by strengthening the institutional autonomy of universities and building effective accountability structures. Continuing collaboration

between regional and local governments, private sector and tertiary education institutions is necessary.

Human capital development in Catalonia

Tertiary education in Spain and Catalonia has experienced growth and transformation over the past decades. The expansion of tertiary education has widened access in Catalonia, but the overall participation rate remains below the OECD average. Economic recession has contributed to the deterioration of the labour market and a large number of youth are outside education, training and labour market. In future, widening access and social inclusion will need to feature more prominently on the policy agenda.

Spanish tertiary education system has experienced significant growth and transformation over the last 20-25 years. In Catalonia, the average number of years in formal education for the working population has doubled, and the population with tertiary education qualifications has grown almost seven-fold. Currently, about one-third of the total working population has received some form of tertiary education. This progress is partly due to the considerable expansion of the tertiary education system now encompassing eight public universities – including the Open University of Catalonia – and four private universities, and more than 300 centres providing vocational tertiary education. There are 177 000 undergraduate and masters' students in universities in Catalonia, representing 12.5% of the Spanish university system in 2009-10. Around 43 500 students are enrolled in vocational tertiary education.

Although student enrolments overall have increased since 2000, with the greatest expansion in vocational education, participation rates for Tertiary-A programmes are below the OECD average. In Catalonia, a significant proportion of the young age group remains outside education and training. In Spain, nearly one in three people between the ages of 18 and 24 have not completed secondary education and are not enrolled in education or training, representing more than double the EU average (EU-27).

While equity policies have improved in Spain, students' financial, academic and social support systems are in need of strengthening. In Catalonia, participation in tertiary education continues to be related to socio-economic background. Because of the lack of adequate student support,

student mobility is limited and a significant number of students need to work while studying. There is also a high level of educational failure with the drop-out rate estimated at 30% by some institutions, and students take longer than necessary to complete their degree programmes.

Challenges in tertiary education in Spain and Catalonia are partly linked to the problems in the secondary education system which features high drop-out rates and poor learning outcomes. Those in school perform poorly in international testing (PISA). According to Pisa results for 2006, fewer than one in 20 of Spain's 15-year-olds reach the top levels of science proficiency. Furthermore only 1.5% of 15-year-olds in Spain belongs to the top performers for reading, the lowest percentage in the OECD countries apart from Mexico. In Catalonia, students learning outcomes have improved since 2000 and the 2009 results are slightly above the national and the OECD averages. However, a lot remains to be done to reach the level of the best achieving OECD countries.

The primary responsibility for overcoming quality and equity gaps in secondary education lies with school authorities at the national and regional level who will need to address the challenges in a comprehensive way and mobilise appropriate levels of financial resources to support education. Universities should, however, actively reach out to local schools to raise aspirations and academic performance of students and to improve the quality of teaching. Catalan universities' focus on widening access measures remains limited in scale and impact, and without collaborative action. Despite some good examples in this field, none of the universities have adopted a strong corporate approach to creating and enforcing mechanisms to facilitate access of the upcoming generations of new migrants to tertiary education. Long-term institution-wide and system-wide collaboration between schools and universities are needed in Catalonia in order to improve the quality of teaching and to raise aspirations.

The current economic crisis has led to the deterioration of the labour market, especially for the young. The rise in youth unemployment obliges young people to stay in or enter the tertiary education system, but offers poor prospects for finding jobs after graduation. Unemployed workers and people in weak economic sectors are increasingly looking to education and training opportunities to improve their position in the labour marker. There is a need to focus on the quality and relevance of education and align it with the regional needs.

Unemployment in Catalonia has remained consistently high throughout the first decade of the 2000s, not falling below 12% and reaching 16.53% in the third quarter of 2010. Since the onset of the global economic crisis, unemployment in the 16-24 year cohort is running at 37% with even higher rates among young males. While unemployment hits harder those without a tertiary education degree, the labour market outcomes of the university graduates are also deteriorating.

In order to better understand how education meets the needs of society and the economy, there is a need for a region-wide system to provide adequate vision of graduate employment and the labour market needs. Furthermore, the universities themselves need to develop a system of tracking the progress of their students and graduates in order to inform curriculum development and align educational provision to regional needs. Porta22 in Barcelona Activa, the local development agency, maintains a data-based labour observatory, conducts research on labour market trends and provides an extensive outreach services to schools and individuals to assist them in assessing job opportunities. There is scope to extend Barcelona Activa's services to act as an intermediary between industry and the regional tertiary education institutions and offer mechanisms for determining changing skills needs in regional firms and industry groups.

There is considerable variation among the Catalan universities in making an effective linkage with the skill needs of the region. While universities have established various forms of work-based learning opportunities and entrepreneurship training for students, in many cases only a small proportion of students in a limited number of fields benefit from them. There appears to be a need for more systematic practice-based pedagogy and research, broader and universal opportunities for student internships and work-based learning, as well as interdisciplinary activity with the fields relevant for the regional economy such as the arts and media, and tourism. The ongoing pedagogical reform under the Bologna agreement provides an opportunity to create stronger ties between students and regional employers through internships and co-operative programmes. It also provides an opportunity to extend internship experiences to community-based organisations in the context of a university commitment to a wider range of regional needs.

The high and rising levels of unemployment necessitate effective lifelong learning provision. Unemployed workers and people in weak economic sectors are increasingly looking to education and training opportunities to improve their position in the labour market. Currently, there is an abundance of public and private providers in continuing education. The Consortium for Continuing Education in Catalonia is in charge of the co-ordination of continuing professional education but does not embrace

universities which have each developed their own lifelong learning activities.

There is limited hard data available to understand the needs of the adult population or the efficacy of tertiary education in meeting them. Barriers remain in developing new university programmes, including the regulated fee structure. There is also scope for improving the universities' interaction with local industries and firms to increase their managerial capacities, technical skills and general knowledge regarding market opportunities. This interaction is particularly important for small and medium-sized enterprises (SMEs) which often lack the managerial skills that could help them specialise and increase productivity. The growing share of skilled services associated with the manufacturing sectors suggests an opportunity to develop educational programmes aimed at high-skilled services to build industry productivity.

The Regional Government of Catalonia, City of Barcelona and the Catalan universities have focused on talent attraction, targeting at international top researchers and students through joint marketing and services. To prepare for the post-crisis economy, these efforts should be continued and balanced with a focus on nurturing talent at home, by utilising the human capital potential among the migrant community. Actions need to be taken quickly to retain and reintegrate immigrants in the workforce and educational system in Catalonia.

Catalonia's talent attraction policies for high level researchers have proven effective. ICREA brings to the regional innovation system top researchers. In 2010, there were about 250 ICREA researchers, who collectively attracted more than their costs in research funds from outside the region. ICREA researchers have higher average publication rates than researchers in the region generally. ICREA researchers have also applied for 42 patents since 2004 and launched three start-up firms. While highly successful, ICREA represents one of the many initiatives in Catalonia that have been created to bypass the rigidities of the university system, leaving the "academic heartland" of the universities untouched.

In the national comparison, Catalonia is one of the most attractive regions in Spain for international students. Joint marketing and services of the University of Catalonia and an increasing offer of study programmes in English attract talent to region and enhance the visibility and impact of the

University of Catalonia System. Efforts have been made by the City of Barcelona to build a “Barcelona Higher Education Cluster” to attract international master’s students.

Immigration has been a key driver for economic growth in Catalonia in the recent years. Catalonia has received many waves of migration and successfully integrated newcomers into the labour market and education system. Between 2001 and 2008, despite a steep decline in its domestic population, Catalonia experienced its largest period of population growth, due primarily to foreign immigration. By 2008, foreign residents accounted for 85% of the growth rate, representing over 1 million inhabitants or 15% of Catalonia’s population.

Unemployment among the foreign-born labour force has increased in all OECD countries. Immigrant youths have suffered disproportionately during the crisis and the comparison with native-born youth, who suffered more than prime-age adults, is significant. In Catalonia, unemployment was highest amongst the immigrant population even before the current crisis; over 45% of immigrant males and almost 40% of females are in temporary employment compared with approximately 17% and 21%, respectively, for the Spanish population. Integrating immigrants into education and labour market systems are important challenges for Catalonia.

Catalonia’s tertiary education sector features an attractive and growing vocational education sector. But the pathways between universities and vocational institutions are in need of strengthening. Catalonia would benefit from a more comprehensive human capital development system stretching from secondary education to tertiary education and lifelong learning.

The tertiary education sector in Catalonia features limited pathways and interaction between universities and the vocational tertiary education and secondary education. Despite the efforts made by the Spanish Government to increase collaboration between vocational and university sectors, for example in the International Campus of Excellence competition, there are only a few examples where universities and vocational education institutions collaborate closely together.

The Regional Government of Catalonia could build stronger relationships among the different components of the education sector: universities, vocational tertiary education institutions and secondary

education, so that they operate as an integrated developer of human capital potential. Furthermore, a mechanism for accreditation and recognition of prior learning could provide a more flexible system by which learners can take up different learning opportunities at different stages of their life.

The challenges of unemployment and widening participation, financing and costs, and internationalisation and competition require tertiary education institutions to work together in partnership with their regions in order to build human capital potential and compete successfully in the global setting. Catalan Association of Public Universities's (ACUP) efforts to build a strategic approach in order to globally position Catalan university education are to be commended. The ACUP governance model, embracing representation from the universities' social councils, is an important development and an indication that the important role of universities in regional development is understood in Catalonia. This concept could be developed further into a tertiary education council, embracing vocational tertiary education institutions, public and private universities, and key external stakeholders. It should also include regional representation, from the public and private sector.

The following measures would promote human capital development in Catalonia:

Recommendations for the Spanish government:

- *Improve affordability of education.* The issue of affordability should be taken up in the national agenda in order not to price tertiary education attainment beyond the reach of students from low socio-economic backgrounds. The national government should develop the form of cost sharing in tertiary education through means-tested scholarships, income contingent loans or other funding packages to complement the existing loan and grant schemes. Both universities and the regional government should improve financial assistance to low income students.

Recommendations for the regional (Catalan) government and universities:

- *Improve evidence-based decision making.* The regional government in collaboration with the Catalan universities should develop a wider portfolio of robust data to support evidence-based decision-making and support targeted efforts to address human capital development needs. The most effective region-wide graduate labour market systems are based on the collection of comprehensive labour market intelligence, on-line publication of the data in a single place to improve students' ability to make rational choices about their

studies and to help graduates and employers to come together and students to move into employment. Efficient systems also use data strategically to identify regional priorities and at an institutional level, to respond to the data in terms of course provision and the provision of employer specified skills. The US National Centre for Public Policy and Higher Education produces useful indicators which might help establish some benchmarks for assessing educational attainment.

- *Create a Strategy for Human Capital Development.* Catalan universities and key stakeholders of the economy and society should work together to develop a long-term Strategy for Regional Human Capital Development to: *i)* define region-wide goals, policies and priorities extending from primary to tertiary education and beyond and *ii)* develop strategies to reach currently under-served population groups. With a large number of young people outside of tertiary education, the strategy should focus on developing pro-active mechanisms to ensure social-inclusion and equity beginning in the early years. Widening access to tertiary education will require multi-stakeholder collaboration between tertiary education institutions, schools and government including pathways between vocational and university sector through development/implementation of a qualifications framework and recognition of prior learning. Stronger efforts are necessary to increase the enrolment and success of first generation students by improving academic, social and financial support. Universities' and other tertiary education institutions' lifelong learning activities should be strengthened and they should improve their capacity to provide up-skilling and re-skilling for the adult population who combine work and study or are unemployed. Policymakers and university leaders should look at initiatives being proposed by the Lumina Foundation, USA, for widening participation and ensuring more adults successfully complete higher education.
- *Reach out Innovation in Catalonia to migrant population.* Regional and local governments should, in collaboration with tertiary education institutions, schools and the private sector, reach out to migrant populations to ensure social and economic cohesion. Current activities need to be scaled up in a systematic way, including long-term multi-stakeholder collaboration with schools to raise aspirations among migrant youth and to improve the quality of teaching. Tertiary education institutions should also reach out and empower the migrant population to address their own challenges through community development programmes.

- *Improve learning and employment outcomes and relevance of education.* Significant multi-stakeholder public-private efforts should be made to boost entrepreneurship, business formation and business development. Tertiary education institutions should focus on strengthening the regional employability and entrepreneurial skills of all graduates. Creating ties between students in fields of critical importance to the region and regional employers through internships and co-op programmes should be made a priority. Work- and problem-based learning methods and programmes to build entrepreneurship skills should be developed to improve the productivity of local production systems, for example in traditional sectors such as textiles.
- *Strengthen sectoral orientation in workforce development.* The industry or sectoral orientation should be extended to human capital development in order to galvanise technical and managerial training around cluster-based manufacturing and manufacturing services. The workforce development system should be adapted to the needs of small firms and to the development of companies in place.

Catalonia has led strategic investment in research and development in Spain and successfully attracted research funds to the region from Spanish and EU sources. Today, Catalonia has a large share of Spain's innovation activity and resources, a strong research infrastructure and a higher share of the labour force with tertiary education than OECD averages.

Catalonia has a long tradition of active regional government policies to promote its innovation system. Its science, technology and innovation policy has focused on knowledge generation and on the “academic” route by providing funding for universities and research centres. Catalan policy for research and innovation has developed with a goal to maximise resources from Spanish and EU levels through the competitiveness of its research assets. While the strategy has focused to a large extent on research centres outside of universities, the region’s approach has also benefited some universities that have been able to build capacity to apply for such funds. Spanish funding sources, which have shown considerable growth rates over the last several years, are under pressure due to the economic crisis.

Catalonia accounts for a large share of Spain’s innovation activity and resources. It is responsible for 21% of Spanish research and development

(R&D) investment and 33.7% of its patents. It contains 22.5% of Spain's innovative firms, a far greater share than other regions. Given its scale and performance, Catalonia is often the largest or second largest recipient region of R&D and innovation-related programme funds from the Spanish government and the European Union (EU) Framework Programme.

R&D spending in Catalonia has increased in absolute values over four-fold from 1996-2008, reaching an overall R&D intensity of 1.61%. Catalonia has been able to capture a growing share of Spain's total EU Research Framework Programmes (FP) receipt over time, from 14.7% in the Third FP to 23% in the Sixth FP. Within the Seventh FP, Catalonia's researchers have successfully accessed the funding streams of the new European Research Council (ERC). Researchers based in Catalonia accounted for 51 out of 90 Starting Independent Research Grants and ERC Advanced grant projects in Spain (2007-10).

Among the region's main strengths are its strong research infrastructure and regional attractiveness, Catalonia being one of the top regions in Spain. Several major scientific installations in the region are associated with universities, such as the Barcelona Supercomputing Centre (Polytechnic University of Catalonia, UPC), the Synchrotron Light Laboratory, CELLS (Autonomous University of Barcelona, UAB), the Centre of Supercomputing of Catalonia, CESCO (all public universities), the Maritime Research and Experimentation Channel (UPC). Several other installations under construction in biological fields and engineering are associated with universities. This strong presence of scientific infrastructure also helps attract international top researchers.

The governance of the regional innovation system in Catalonia is complex. This complexity is due in part to the proliferation of research entities, networks and science parks over the last several years. Catalonia has 25 science and technology parks, 17 led by universities. The regional government has recently taken measures to better manage this complexity through mergers and new co-ordination structures. These measures should be continued and strengthened.

Universities have made commendable progress in knowledge generation but there is scope to improve knowledge diffusion. The dominant innovation model has a science and technology focus which limits the mobilisation of universities for social and cultural innovations. There is also a need to balance the current focus on commercialisation with long-term

university-industry collaboration. Finally, incentives for universities to engage in regionally relevant research need to be strengthened.

Scientific production has experienced a positive trend, Catalonia accounting for 25% of Spanish total production. During the period 1996 to 2006, the region's share of Spanish production grew from 21.2% to 25.5%, and of world production from 0.5% to 0.9% (1% today). Most of those publications are coming from the province of Barcelona (87%), reflecting the concentration of university faculty there. Universities are responsible for 60% of the region's scientific production, 50% of scientific publications focus on biomedical and clinical research.

There has also been a positive trend in patenting activity in universities, with the technological university UPC BARCELONA TEC accounting for the largest share of university patents. There has been a focus among universities and the regional government on creating university spin-offs, but the spinoffs often remain academically-oriented and facing challenges for growth. Public universities have each gone down the route to establish technology transfer offices, but many of these focus on administrative, rather than strategic functions and lack critical mass.

According to the Spanish Law, universities provide a public service through research, teaching and collaboration with society. While most Catalan universities embrace regional engagement in their strategic plans, there is a narrow understanding of the third mission and regional engagement, focusing on "science and technology push" model which limits a broader approach to regional and local development. Furthermore, an emphasis on long-term relationship and partnership building would allow the universities to improve access to knowledge captured within the institution and improve the quality and scale of knowledge exchange activities.

One of the main challenges for promoting universities' regionally relevant research and technology transfer activities is the lack of incentives for individual researchers and institutions. Professor evaluations for salary and access to research grants have been based mainly on publications and did not consider research or consulting with firms. Initial attempts to improve incentives are found in the new Catalonia Research and Innovation Plan 2010-13 which proposes to put in place several actions to change the incentives for professors, research groups and universities. These incentives concern evaluations of professor performance as well as considerations for research grants and programme contracts with research groups and universities that would require an orientation of a certain share of resources

towards regional priorities. These developments are commendable and should be strengthened in the coming years.

The following measures would promote regional innovation in Catalonia:

For the Spanish government:

- *Accelerate curriculum reform:* There is a massive effort underway already in curriculum reform with the Bologna Process. Remaining barriers for universities to adapt curriculum to meet innovation system needs should be tackled.
- *Embark on a university governance reform:* Some of the barriers to university engagement relate to the democratic selection process of several layers of hierarchy. The unintended consequences of this system are an inability for universities to make decisions that could promote engagement in the regional innovation system but are “unpopular” or require flexibility to set aside resources.

For the regional (Catalan) government:

- *Increase efforts to organise and stimulate firm demand for knowledge to better interface with universities.* This brokering role is costly and complicated for universities when the private sector itself has not been organised. The success of BioCat proves this point. In the sub-regional capitals of Girona, Lleida and Tarragona, it can be easier for universities to identify the right firm groups for effective dialogue.
- *Make effective use of performance indicators:* The regional government has taken a positive step to require performance indicators in the funding mechanisms for universities. While knowledge generation is a primary goal for universities, a wider concept of innovation should be adopted and there should be a caution on focusing only on university patents and spinoffs as indicators. Which illustrates a narrow approach the university role in a regional innovation system.
- *Provide “challenge-driven” research grants for universities.* Regional challenge-driven research grants should be made available for areas of importance to the region, in science-based research or other forms of social innovation. Generally universities are better placed for inter-disciplinary research needs than a separate research

centre structure. In order to make the connection between the current research focus and a more broadly defined third mission, “translational research” could be adapted to address the critical issues that bridge campus and community.

- *Promote greater territorial specialisation in S&T and innovation.* Such support would help orient the role of different actors, including universities, in their regional engagement. Again, the 2010-13 Plan should help as it has added a new focus on this territorial dimension. Strengthening this approach could help clarify sub-regional strategies and priorities as well as firm needs.
- *Improve university-government interface for policy design.* Identify ways to improve university-regional government relations through existing councils linked to the Catalan Ministry of Innovation, Universities and Enterprise (DIUE) but also through other government initiatives. There are a number of strategic agreements that either directly concern universities or address areas where universities could play a stronger role.
- *Improve data reporting and analysis.* There are some platforms in Catalonia and Spain for universities to report on statistics related to their “third mission” activities. But standardised reporting is not occurring consistently and on a sufficiently wide range of indicators. Common definitions and consistent collection of such data is essential both for analysis of progress and as the basis for possible performance incentives in funding.

For the Catalan universities:

- *Take action despite constraints.* Many universities have already taken action in different areas that impact the regional innovation system, depending on the culture of the institution.
- *Further integrate the entrepreneurship/firm perspective.* There are attempts to inform students in different degree programmes, particularly PhDs, about entrepreneurship, but currently only a small proportion of students benefit from these activities. More joint efforts are required in this area.
- *Map university expertise to better interface with productive sector.* Mapping of different departmental areas of expertise can be challenging, but it is needed for helping firms access information. There are some marketing efforts focused on patented areas of

expertise in science and R&D intensive areas, but this needs to be expanded.

- *Promote PhD mobility to firms:* This is a challenge in Spain generally, and there are national programmes that also support this goal. Universities could take more action as well, not only in hard sciences but also in other fields such as social sciences.
- *Build opportunities for more inter-disciplinary linkages:* Given the governance challenges in universities, it is difficult to formally develop new curriculum or research agendas. There are also unexploited opportunities in the region, such as bringing together multiple disciplines to work with researchers in the science parks, including business schools.
- *Develop regional knowledge transfer model* that is based on ongoing relationship with industry: while the university technology transfer models may lead to saleable intellectual property and start-ups, they seldom produce enterprise that grow in the region and contribute to regional economic development. Localised supply networks are therefore critical to the process through which innovation is transferred to enterprises and to create new innovation and transforms and upgrades existing industries. The development of a well-functioning regional knowledge transfer model requires ongoing relationship with industry to determine what innovations have the best opportunities for adoption and commercialisation and the creation of an industry-university learning environment. It requires support for the human capital development required to adopt and apply process and product innovations and collaboration with SMEs as well as large corporations. It measures success in terms of the sustainability and transformation of regional industry and employment growth.
- *Reform degree programmes* to improve employment and entrepreneurship outcomes by integrating work-based, problem-based and co-op models

Cultural and creative industries and sustainable development in Catalonia

Barcelona is a leader in cultural and creative industries which form a pillar of its economic development and future prosperity. However, the City of Barcelona and the Regional Government of Catalonia have not given the cultural and creative industries a major focus in cluster development. There is also scope for universities to play a more active role in this domain.

Barcelona is a centre of creative industries in Europe with strengths in design, including textile and industrial design and architecture. There are also spillovers to other cities in Catalonia and evidence of indigenous development in cultural and creative industries in the provincial capitals. Cultural and creative industries contribute to the growth and development of Catalonia, through attraction and retention of talent and knowledge-intensive businesses that tend to move to regions with “talent, technology and tolerance”. Catalonia is ranked sixth among the top 25 European regions in cultural and creative industries, with an over-representation of employment in the sector when compared to other European regions.

While specialised design training programmes in Barcelona have high impact on the local economy, the Catalan universities’ contribution to the development of skills that support the creative industry presence in the region could be improved. Given the high proportion of self-employment and small business in the creative sector, the universities in Catalonia could contribute to the development of the regional creative economy by developing and expanding programmes in entrepreneurship and non-profit management both in formal degree programmes and through extension efforts. Furthermore, the Catalan universities could jointly sponsor an observatory on cultural and creative industries.

Among the most important fields in the creative industries are software, television and radio and advertising. This strength in the Catalan economy is related partly to the bi-lingual character of the region and the need to provide specialised language programming in both Catalan and Spanish. Universities participate in the preservation and celebration of the Catalan language and culture. Universities could also contribute to building a more inclusive Catalan culture.

Spain is a world leader in renewable energy industry development. Catalonia has been an active region in building a renewable energy economy and also in research and development

efforts that can position the region internationally as a leader in new renewable energy technologies. There is also a need to create skills for “green jobs”.

Spain is a world leader in renewable energy industry development. This leadership has emerged from supportive national government policies. Although lagging Spain in providing its own renewable energy sources, Catalonia has been an active region in building a renewable energy economy and also in research and development efforts that can position the region internationally as a leader in new renewable energy technologies. For example, since 2006, water systems in all new residential construction in Catalonia must be heated by solar panels. Since 2007, the Catalan government has given more than EUR 15 million in grants to homeowners to help pay for renewable energy installations.

Despite the university initiatives and research centres focusing on environmental development and sustainability, the university sector in Barcelona lacks strength and visibility in the arena of renewable energy research and development. Given the critical role that the development of sustainable energy and energy efficiency play in the Spanish national agenda and in the future of its economy, joint university efforts in this arena seem warranted. Tertiary education institutions in Catalonia could increase their co-operation with local or regional one-stop-shop agencies for business support. By training the trainers and other knowledge dissemination activities, tertiary education institutions could help these agencies acquire the specialised skills to advice firms on the cost-effective ways to reduce emissions.

Many national and regional governments in the OECD area are adjusting their skill strategies to take into account the emerging demand for new skills in the green industries, by introducing incentives to facilitate re-training and efficient mobility of learners between vocational institutes, universities and industries. Catalonia could take steps to anticipate what the employment effects and labour reallocation are needed across industries. Skill creation for “green jobs” could be more efficiently organised at the regional level by pooling learning resources of educational institutions and industries.

Barcelona and Catalonia is known for the quality and ambition of its physical planning, for environmental and urban planners’ ability to integrate the old with the new, and for innovative approaches to enhancing an environment with advantageous location. Co-operation in this domain should be extended to a broader agenda to make Barcelona and Catalonia an urban model for energy efficiency and the use of renewable energy.

Barcelona's urban regeneration model has transformed old industrial and/or distressed areas into multi-functional urban areas and placed universities at the core of these developments. This collaboration should be continued to prepare for the post-crisis economy and to ensure creativity, social cohesion and economic development.

The following measures would enhance the cultural and creative industries and sustainable development in Catalonia:

Recommendations for the regional and local governments:

- *Boost green growth and eco-innovation.* Collaboration between tertiary education institutions and industry should be enhanced, for example through targeted innovation vouchers for small and medium-sized enterprises and collaborative platforms for eco-innovation. Skill creation for green jobs should be more efficiently organised by pooling learning resources of educational institutions and industries in Catalonia and providing flexible pathways between educational institutions.
- *Support cultural and creative industries.* In cultural and creative industries regional government should, in collaboration with educational institutions and the public and private sector, increase its efforts to support entrepreneurial skills among students and graduates and better further education opportunities. Multidisciplinary collaboration across tertiary education sectors and different institutions should be encouraged through and encouraging the establishment of joint institutes, departments and institutions.

Recommendations for the Catalan universities:

- *Develop a forum for social, cultural and environmental development.* A systematic exchange of information and experience should be put in place between tertiary education institutions in terms of environmental sustainability, eco efficiency and green growth, urban regeneration and integration of migrants, and cultural industries facilitated by ACUP, the regional or city government(s) in order to bring greater efficiency and balanced coverage and to avoid fragmentation and reduplication. There is a need for a tracking of various initiatives and an exchange forum where different initiatives would be identified and best practices publicised for urban policy fine-tuning and for widening access to tertiary

education institutions. Such a forum could organise thematic events, with regular information retrieval and exchange facilitated by a dedicated website.

- *Capitalise on Catalonia's attractiveness to immigrants.* The universities of Catalonia should take a leadership role in regional initiatives to develop strategies to integrate immigrants, including those from families with low educational attainment. The universities of Catalonia would also benefit from an active role in international study of immigration, integration and the metropolis and to help build regionally relevant integration plans. Catalan universities could raise public officials' and other stakeholders' awareness of labour market and educational strategies and encourage positive action.
- *Contribute to the cultural and creative industries.* Given the high proportion of self-employment and small business in the creative sector, the universities of Catalonia should contribute to the development of the regional creative economy by developing and expanding programmes in entrepreneurship and non-profit management both in formal degree programmes and through extension efforts. For example, the University of Catalonia could sponsor an observatory on cultural and creative industries.

Capacity building in the tertiary education system of Catalonia

Strengthening of the university autonomy can unleash the potential of universities for regional and local socio-economic development and improve efficiency and transparency in education. But autonomy is not a sufficient precondition to guarantee greater engagement of universities with the labour market and regional development if the right incentives and accountability schemes are not in place to support such activity.

University education in Spain is governed through complex and overlapping legislative and policy agenda at the national, regional and sub-regional level. Since 1985 the jurisdiction for the universities has rested with the Government of Catalonia. The Association for Catalonian Public Universities (ACUP), and the Interuniversity Council of Catalonia are the co-ordination bodies for the university sector. Despite the system level co-

ordination, universities compete for students, staff and external funding and have limited tradition for collaboration, leading the duplication of programmes and a lack of specialisation.

Catalonia has a number of key strategy documents and plans with a focus on internationalisation and regional development, featuring growing participation of universities in their development and implementation, including the Strategic Agreement for the Internationalisation, Employment Quality and Competitiveness of the Catalan Economy 2008-11 and the Catalan Agreement on Research and Innovation, CARI. However, participation of universities in regional government bodies is not mandatory and there is no clear mechanism of articulation among the different strategies, plans and other instruments. In order to ensure return on public investment there is a need for better co-ordination between the strategic plans and their implementation. Furthermore, a permanent partnership structure bringing together the regional government, tertiary education sector and key public and private stakeholders could improve the situation.

Spanish and Catalan universities have a legal obligation to public service, but there is a lack of national, regional and institutional policies to improve the incentive structures to support the regional and local engagement of universities and their faculty and staff. The lack of incentives is a common feature in many universities and countries where regional engagement is perceived not only as a secondary role for universities when compared with research but also as a detracting activity. In Catalonia, the recruitment, and promotion of the university staff are nearly exclusively determined by research performance, measured primarily by publications. Management and leadership functions are poorly rewarded and the “third mission” activities have been traditionally absent from the list of factors that have an impact on faculty career development. The rigid rules governing civil service and the fragmentation of staff into non-permeable categories have become obstacles to the diversification of tasks, salaries and duties that characterise modern universities. While innovative leadership can drive institutional change and mobilise university staff in individual institutions, such as the University Rovira i Virgili, system-level steering is required to mobilise the whole university sector.

Catalan universities perform under a system of shared governance which is decentralised and “democratic”. The decision-making powers are shared between all the potential stakeholders, which often result in a lengthy, unclear and cumbersome decision-making process. The public university governance is regulated by law, which prescribes in detail the internal organisation of the university with a number of collegial bodies. Most Catalan universities have also opted to use a maximum possible number of

members for both Senate and the governing council. There is also a burdensome election process to identify the university leaders.

During the last five to ten years there has been a trend to change the university governance and management in Europe and to make the universities more responsive and accountable to their stakeholders. To unleash the potential of universities for local and regional development and industry collaboration, Spanish government could consider launching a university reform including the following elements: *i*) reduction of the level of regulation of the university system; *ii*) creation of governance boards or councils with an increased presence of members coming from outside the university; *iii*) enhancement of the power of the executive bodies: rectors and their management teams; *iv*) increased professionalisation of university management; *v*) modification of the functions of the collegiate bodies representing the academic community, *i.e.* the senate or academic board; *vi*) increased autonomy of universities with respect to the recruitment of teaching staff and *vii*) increased autonomy and freedom of universities in terms of teaching on offer, the access of and choices available to students, the cost of enrolment and the fees charged by public universities.

To move this agenda forward, the Spanish government could consider a pilot project for the governance of public universities in Catalonia through which the universities could progressively achieve opportunities for flexibility in institutional development and human resources management. The increased autonomy would need to be introduced differentially in a phased-up fashion, and over time depending on the capacity of the institution and the extent of the challenges they face.

Recommendations for the Spanish government:

- *Take steps to modernise university governance by launching a pilot project.* To remove the barriers for universities engagement in regional and local development and other entrepreneurial activities, the university collegial bodies, with elected rectors and deans, should be replaced by a dual structure with appointed leaders and boards including external stakeholders. Universities should have increased institutional autonomy over financial, estate and human resources management. An agreement could be reached whereby some Catalan universities could apply to adopt more managerial forms of governance and be granted a higher degree of autonomy. Such a programme could run for five to seven years as a pilot project that would be evaluated and results disseminated afterwards throughout the university system.

Recommendations for the regional (Catalan) government:

- *Establish a regional co-ordination platform for tertiary education.* To enhance co-operation and long-term dialogue between tertiary education and the region a co-ordination platform involving university rectors, presidents of social councils, and local and regional governments should be established. The Regional Government of Catalonia should develop a framework and a strategic plan, elaborated as a shared task between the stakeholders – university and the region – to promote this co-operation. Progress should be monitored and relevant changes included in a dynamic way. Steps should be taken to ensure that there is better collaboration between the university and vocational tertiary education sector.
- *Strengthen incentives for universities' regional engagement activities.* The Regional Government of Catalonia should design a funding allocation mechanism to drive the engagement of universities and different stakeholders in joint strategic initiatives. The regional government should take a full advantage of the decentralisation of the funding for universities in order to reward and incentivise contribution of universities to regional development.

Recommendations for the Catalan universities:

- *Prioritise regional and local development.* The universities of Catalonia should attach a top priority to the region-wide socio-economic development and engagement by making the rector or pro-rector (who is reporting directly to the head of the institution) responsible for this task. A professional management should be put in place to support this task. Along with science and technology transfer, stronger focus should be given to a broad range of regional and local development such as human capital development as well as social, cultural and environmental development. Incentives should be created to encourage university faculty and staff engagement.
- *Collaborate to rationalise the degree programme offer.* The universities in Catalonia should develop ways to rationalise their offer of degree programmes and to develop joint degree programmes at master's and PhD level. Good progress has already been made in inter-university PhD and master programmes.

OECD reviews of higher education in regional and city development

Universities and other higher education institutions can play a key role in human capital development and innovation systems in their cities and regions. In the context of global economic and financial crisis, OECD countries are seeking to mobilise higher education institutions (HEIs) to support more strongly their economic, social and cultural development.

In 2008, the OECD/IMHE launched a second series of OECD Reviews of Higher Education in Regional and City Development to address the demand by national and regional governments for more responsive and proactive higher education institutions. As a result, 14 regions in 11 countries have undergone the OECD review process in 2008-10.

This OECD Review of Higher Education in Regional Development of the Catalonia in Spain (<http://www.oecd.org/dataoecd/28/36/46826969.pdf>) explores a range of policy measures and institutional reforms to mobilise higher education for the development of the region. It is part of the series of the OECD reviews of Higher Education in Regional and City Development. The reviews analyse how the higher education system impacts local and regional development and help how this impact can be improved. In addition to human capital and skills development, technology transfer and business innovation, the reviews also considers higher education's contribution to social, cultural and environmental development and regional capacity building.

To know more about the OECD review process and requirements, visit Higher Education and Regions' website at

www.oecd.org/edu/imhe/regionaldevelopment.