

OECD Review of Higher Education in Regional and
City Development

Berlin, Germany



Assessment and recommendations

Towards a better functioning human capital development and regional innovation system in Berlin

Berlin is the largest city and the capital of Germany with more than 3.4 million inhabitants. Once a manufacturing city, its economy is now dominated by the service sector (close to 85% of all employment) with a strong emphasis on education, research, cultural and creative industries and health services. Although downsized since reunification, the public sector accounts for the bulk of jobs. The capital's most important economic sector is health services with approximately 180 000 employees. Small and medium-sized enterprises are the predominant form of organisation in the private sector accounting for 80% of employment in Berlin. In terms of social structure, Berlin is characterised by a large migrant population accounting for 14% of the total number of residents.

The size of the higher education and research sector in Berlin relative to the overall economy is significant. As a net importer of students and by winning national and international research grants and contracts, higher education and research make a powerful direct and indirect impact on the city. Universities and research institutes are a key sector of the Berlin economy. The sector accounts for 4.4% of the city's GDP. Higher education and research are strongly embedded in the economic, social and cultural life of Berlin. The institutions collectively form a magnet which attracts students, researchers and business in search of talent. There is a high level of recognition of the economic and social impact of higher education including its contribution to human capital development in general. Berlin's strong higher education and research sector, cultural industries and creative people provides a strong base on which to build an innovative and entrepreneurial city.

However, Berlin has not met the economic expectations following reunification, as the capital has not been able to re-establish its standing as an industrial city. The expansion of the service sector, notably the development of the health and culture industries, has only partially compensated for the demise of the traditional industrial base and the sharp reduction in public employment in both East and West Berlin. Albeit lower than in East Germany, unemployment rates in Berlin constantly remain some 6-7% higher than the national average, with many of the unemployed being those from immigrant backgrounds or with low skills. In this context, the key challenges for the Berlin Senate and its higher education institutions are the following:

- How to promote new business formation and attract knowledge-based businesses (industry and services)?
- How to promote the development of the existing heterogeneous SME base?
- How to address the challenge of long term unemployment and the needs of the migrant population by providing access to areas of growth?

To face these challenges, Berlin needs concerted efforts and a system approach to human capital development as part of a broad-based regional innovation system. Stronger incentive structures are necessary to mobilise higher education institutions for local and regional development. In order to improve regional development outcomes, evidence-based decision making needs to be strengthened within the Senate and higher education institutions. In addition, creating jobs and providing access to employment opportunities should be seen as the primary goal of innovation and human capital development in Berlin.

The current extent of regionally relevant activities by Berlin higher education institutions, including industry collaboration, widening access initiatives and entrepreneurship activities, are more the result of bottom-up processes and not fully reflected in higher education policy or institutional set-up. There are gaps in important areas such as lifelong learning and the needs of migrant populations as well as support for small and medium-sized-enterprises. This situation manifests itself in:

- A lack of strategic anchoring within higher education institutions and within the higher education “system” in Berlin. Action is often dependent upon the commitment of individual staff or students, and not reflected in strategic development, curriculum development or budget allocation of the higher education institution. The current indicator-based funding system does not provide sufficient incentives structures for the mobilisation of higher education to regional and city

development. The system of institutionally steered incentives and support activities linking higher education/research with the region remain inadequate.

- Weak legitimacy of the needs of the city within the higher education institutions, particularly research-intensive universities. Regionally and locally relevant activities are predominantly viewed by the higher education leadership as a “third mission” and often not seen as linked to research or academic subjects and this mindset limits the resources invested for into these activities. Incentives allow for isolated initiatives, the impact of which is diminished by their non-coordinated character.
- A co-ordination deficit within higher education institutions and within the higher education system. A range of services, departments, individuals and structures are delivering their own activities without co-ordination and monitoring of results. The co-ordination of information and action on the part of the various public agencies, higher education institutions and research institutes as well as various stakeholders is also in need of improvement.
- Weak evidence base. The system of gathering information on the regional environment as well as the successes and failures of respective activities of higher education institutions and research institutions is limited in scope and quality. There is a lack of information and robust data particularly in the field of skills gaps, ethnic and socio-economic backgrounds of students, student progress, graduate employment, graduate destinations (outmigration), breadth and scope of work-based learning activities and business formation which make it difficult to evaluate the outcomes of local policies and institutional practices.

Regional innovation in Berlin

Berlin is one of the prime locations for science in Germany and ranks among the top three innovative regions in the EU. The Berlin Senate has made strong progress in making innovation a pillar of its economic development...

With its diverse set of higher education institutions, more than 70 publicly funded R&D institutes, a number of national laboratories and 40 technology parks and incubators, Berlin is one of the prime locations for science in Germany and among the top three innovative regions in the European Union. About 40 000 people, 3% of Berlin’s workforce, are

engaged in R&D activities. Significant investments have been made in research and development; Berlin spends 4.2% of its GDP in R&D, which is more than any other German State.

The Berlin Senate has made strong progress in making innovation a pillar of its future prosperity. It has a science-led strategy for economic development and capacity for its delivery. This involves the identification of key areas of strength in research and the development of technologies with considerable commercial potential. The strategy focuses on “competence fields” - medical technology, biotechnology, health, traffic engineering, ICT/media, optics and power engineering especially renewable energies. These fields constitute building blocks for the three industrial clusters in health, communication and media and transport systems that are expected to help transform Berlin into a knowledge-intensive innovative region over the next decade.

Berlin’s three research-intensive universities and two well-functioning science parks, Adlershof and Buch, are the cornerstones of the Senate’s ambition to turn Berlin into an innovative region with a high degree of knowledge-intensive industries and jobs. Their combined knowledge base has a considerable potential for new business formation and attraction of external firms. Although the business base of the city is limited, links between researchers and key firms have been supported by intermediary bodies, numerous networking arrangements and providing spaces where business and research can work together and new business can be incubated. The Senate also supports a number of delivery organisations, such as the Berlin Investment Bank and the Berlin Technology Foundation that interface with higher education and research.

Berlin’s science-led strategy has been successful: the investments linked to the research base have contributed to significant employment growth in the key competency fields. Between 2003 and 2007, the competence fields grew in terms of employment by 16%, compared to an overall decline of 2.2% for all manufacturing industries. Success is most evident in life sciences where there are well-established processes of science-led innovation linked to clinical practise.

...but science-led innovation is not enough to address the challenges of long-term unemployment and a low absorptive capacity in the SME-based economy. Research has to be diffused to be exploited by firms in the region to create employment and economic growth. This

calls for strengthening the capacity of the universities of applied sciences...

The Berlin competence fields, clusters and science parks are strongly R&D based and seek to exploit research outcomes of the three universities and public and private research institutes to produce radical innovations. Berlin's science-driven strategy is, however, less appropriate in other sectors where innovation is more incremental and user-driven. The strong presence of traditional small and medium-sized enterprises and long term structural unemployment pose a challenge for Berlin's economic development.

Almost all higher education institutions in Berlin have technology transfer offices, career centres and third-party funding counselling services that aim to facilitate industry collaboration and knowledge exchange. Many of these offices remain understaffed and poorly equipped to collaborate with smaller firms. For example, *Humboldt Innovation GmbH* is now a wholly owned subsidiary company of the university which aids and facilitates sustainable collaboration between science and business, realising contract research projects and supporting scientific services in a competent, flexible and unbureaucratic manner. However, its capacity to collaborate with small and medium-sized enterprises is limited. Collaboration with business and industry appears also limited in PhD training where stronger links could be made with key clusters and entrepreneurial skills could be provided.

Currently, the HEI-industry linkages remain weak in terms of small and medium-sized enterprises. The universities of applied sciences are often better equipped than research-intensive universities to engage with small and medium-sized enterprises as well as the health sector or welfare services. As a response to growing market needs, Berlin's universities of applied sciences have developed their business interface units, for example the science-business co-operationcentre KONTAKT at the Hochschule für Technik und Wirtschaft in Berlin (University of Applied Sciences for Technology and Economy).

Recognising the need for more integrated responses, the Berlin Senate has sponsored the establishment of the Institute for Applied Research to improve the collective capacity of the universities of applied sciences to address the needs of the small and medium-sized enterprises. This institute will bring together the technology transfer and lifelong learning offices in each university to offer a one-stop-shop for Berlin business. This is a challenging effort and careful consideration needs to be made in designing the business model underpinning the distribution of income and costs between the individual institutions.

Despite the progress made, the universities of applied sciences face a number of constraints in knowledge transfer. Their funding model is closely tied to student numbers and so restricts their capacity to invest in R&D-related activities. More significantly, the considerable teaching load of academics works against engagement with more speculative developmental projects that might benefit business and the community in the city. Unlike professors in the research-intensive universities, senior academic staff in the universities of applied sciences receives minimal research support the university to underpin their externally-orientated work. Salaries are also linked to teaching rather than to research performance. Spreading an applied research culture through the universities of applied sciences remains a challenge.

...to overcome the fragmentation of the regional innovation system, a more system-oriented regional policy is needed with active outreach to SMEs, new types of innovation tools, further education provision and sector-based policies. Closer collaboration is also necessary between the research intensive-universities and universities of applied sciences...

Berlin, like many other metropolitan regions, faces a risk of fragmentation in its regional innovation system due to weak connectivity. To overcome the fragmentation of the regional innovation system, a more system-oriented and pro-active innovation-based regional policy should be devised and anchored on both science-led and user driven innovation.

New types of innovation tools are needed to provide small and medium-sized enterprises with access to resources that will be helpful in innovation projects. These tools would increase the innovation capacity in firms by providing them with necessary resource inputs, financial support for product development and contacts with relevant knowledge organisations or assistance in solving specific technological problems where the absorptive capacity of the firm is critical. In addition, there is a need to enhance the organisational learning in the small and medium-sized enterprises to change behaviour and to develop management skills and innovation strategies. Highly skilled people and the skill provision, including better lifelong learning and further education opportunities from higher education institutions, are critical resources in upgrading the skills and capacities in the small and medium-sized enterprises. International experience has shown that

stronger sector-based policies are often useful when approaching the heterogeneous SME-base.

In order to achieve a more broad-based innovation policy embracing both science-led and user-driven innovation, closer co-operation is needed between the research-intensive universities and universities of applied sciences in Berlin. Better co-operation and coordination would also enhance student mobility and pathways between institutions, increase the attractiveness of the higher education institutions among the industry and promote closer industry-university cooperation.

The following measures would promote the higher education institutions' contribution to regional innovation in Berlin:

- The local/regional dimension of the “third mission” of the research intensive universities should be strengthened through promoting their pro-active engagement in regional development. This should be done by recognising the need for “triple helix” collaboration embracing the government, industry and academia as a guiding policy framework for regional innovation. Research-intensive universities should aim to move from undertaking “generative” activities to becoming more engaged in “developmental” activities. Stronger links could be made with PhD training and cluster development and to provide PhDs with entrepreneurial skills.
- A systemic perspective should be applied to the regional development strategy by improving the connectivity in the regional innovation system through better collaboration and a more efficient division of labour between the research-intensive universities, universities of applied sciences and research institutes and their respective partnering industries in order to create closer research collaboration across the higher education and research sector and industry, particularly small and medium-sized enterprises.
- The research and development capacity of the universities of applied sciences should be improved in terms of time and funding in order to make them better positioned to assist and co-operate with small and medium-sized enterprises. To improve the absorptive capacity of small and medium-sized enterprises and to reduce the cognitive distance between small and medium-sized enterprises and higher education institutions, policies should be implemented to encourage mobility schemes and technology brokers. The provision of further education by higher education institutions should be upscaled and extended to re-skilling and up-skilling activities.

- Incentives should be strengthened for higher education institutions and research institutes to increase their capacity to act as technology transfer agencies as they bring non-local knowledge to Berlin by attracting talent and foreign direct investment. Incentives for higher education institutions and their staff to engage in local and regional development activities should also be created.

Human capital development in Berlin

In human capital development, Berlin has a wide supply of study places which are overwhelmingly expected to be funded by locally allocated tax revenues. This poses a serious challenge for Berlin...

Berlin has a large investment of human capital development in terms of the number of higher education institutions, student enrolment, teachers and researchers. The total number of higher education students in Berlin is about 135 000 (2008); roughly 70% of them are enrolled at research-intensive universities, 25% in universities of applied sciences and 5% in universities of fine art and music. Berlin accounts for about 6.74% of national higher education enrolments, while its share of the overall population is only 4.14%.

The high level of supply of study places is expected to be funded overwhelmingly by locally allocated tax revenues in Berlin. The city has experienced a process of cuts in the public sector, including higher education, for many years. The city state of Berlin has had to shoulder the cost of higher education for a student population more than one and a half times as large as the average found in German regions with a corresponding number of inhabitants. For this reason, Berlin continues to face greater challenges in higher education funding than other city states.

Financial stringencies in core funding, national level projects such as the “Initiative for Excellence” and the indicator-based higher education funding system have led the Berlin universities to seek diversification of funding streams. The greater focus on the pursuit of world class excellence in research may have unintended effects on socially and regionally relevant activities linked to teaching and learning and the regional engagement of higher education institutions.

...there are challenges in human capital development including low tertiary attainment rates, long study times, high dropout rates and limited mobility of students between educational institutions which call for better co-ordination in the education system and more transparent pathways...

The Berlin higher education institutions tend to have longer study times and higher dropout rates than Germany in general. Recent decades have, however, seen rapid progress in completion rates. Between 2002 and 2007 all higher education institutions in Berlin improved their completion rates. For the three research-intensive universities the average rose from 46% to 63%, while for the universities of applied sciences it grew from 63% to 88%. Despite the positive progress, continued focus is needed in this area. The regional labour market in Berlin is not able to absorb all graduates and some of them move to other cities or regions after graduation or accept jobs below the level of their qualifications. Systematic studies about graduate mobility and success and collection of comprehensive data on graduate's careers are required.

One of the main issues impeding human capital development in Berlin and neighbouring Brandenburg is the absence of region-wide mechanisms to articulate a long term vision and implement an integrated development strategy for all educational institutions. Transparent pathways for students through the education system are required. This would involve the development of stronger credit recognition schemes, course and programme articulation agreements, clear and enforceable policies related to credit transfer and increased support for joint and collaborative programmes.

...reforms are also needed to widen access to higher education among non-traditional learners from lower socio-economic backgrounds as well as mature students. Lifelong learning activities should be scaled up aggressively...

According to the ongoing OECD Review of vocational Education and Training, only limited success has been reached in channelling students with VET backgrounds to tertiary education. In Germany, the share of students taking the “non-traditional routes to higher education” is small, ranging

from 1% to 4%. Germany also ranks among the least active of the OECD countries in terms of the participation in lifelong learning. There is limited robust data available about equity in higher education in Germany and Berlin in terms of access of non-traditional learners or mature students to higher education which suggests a lack of policy focus. Given the long term unemployment in Berlin and the challenging demographic development with an ageing population, more attention is required in this area. Skills upgrading and general enhancement of qualifications would improve competencies of the work force. So far, the Berlin higher education institutions have shown only limited interest in this area. National reforms have been made in 2009 to widen access to tertiary education. It is however too early to evaluate the impact of these reforms.

...there is a particularly strong need to target efforts at Berlin's significant migrant population to improve labour market outcomes and to reduce social and cultural exclusion...

Berlin has a significant foreign born (14%) and immigrant background population (23.8%) with low higher education participation rates. The competitive environment limits access of Berliners with immigrant backgrounds to higher education as they usually lack the secondary schooling grade levels that would ensure entry into the system. Among the graduates of Berlin upper secondary schools in 2007, the proportion of foreign nationals was 5.6% and the proportion of pupils with migrant backgrounds (including all pupils whose first language is not German, irrespective of their nationality) was 9.7%. These rates are far from being reflected in higher education enrolment. There is limited robust data in this domain. For the vast majority of immigrants who are German nationals because at least one of their parents is German or has acquired German citizenship, no specific statistics are collected. The share of non-Germans who received their *Abitur* in Germany varies between 2% and 5% at the universities and between 2% and 7% at the universities of applied sciences.

Widening access to higher education is one of the broad policy goals pursued by the Berlin Senate. The migrant population provides an important un-tapped potential for additional higher education students right in the heart of the city. This means reaching out to a large population segment that is characterised by lower German language proficiency, lower secondary education attainment, high unemployment and often poor living conditions in one of Berlin's distressed urban areas. This is a tough but necessary task since failure will manifest itself in the cost of exclusion, such as the bill for law enforcement, the lack of earning power of the under-educated and

unemployed, and the cost of health services and welfare benefits to population in economically distressed areas. It also means that talent is wasted.

To date, no effective policy tools have been devised to increase the enrolment of pupils with a migrant background graduates from Berlin secondary schools. Some measures have been taken to improve the conditions in secondary schools with high proportions of youth from low-income families and youth with migrant backgrounds. For example, the student-teacher ratio has been decreased to 14 to 1 in secondary schools with a large proportion of migrant students as compared to 24 to 1 elsewhere. In addition, according to Berlin's higher education law, 1% of study places are reserved, on probation, for students having barely missed passing the *Abitur*. But since there are few candidates, the possibility is seldom used. Study places that could have been filled by non-German students residing in Germany are often occupied by students coming from foreign countries, not from Berlin.

Some higher education institutions have taken action to reach out towards people with immigrant backgrounds. Positive outcomes would however require consistent, long-term actions by higher education institutions to reach out to schools in vulnerable areas in order to improve the quality of teaching and to raise aspirations among the migrant youth. The educational disadvantage of migrant population in Berlin is, however, so pressing that individual and institutional responses should be supported by a long term multi-stakeholder collaboration led by the Berlin Senate.

...higher education in Berlin has traditionally placed emphasis on professionally relevant learning although no robust data is available on the scope and extent of this activity. The new shorter degrees may endanger this tradition if mechanisms are not put in place to guarantee stronger institutional anchorage, co-ordination, and evaluation...

Berlin higher education institutions have launched initiatives, projects and programmes with close labour market links. Students and staff engage in collaborative efforts with business and industry, community outreach and volunteering that are likely to improve students' labour market outcomes. For example the Dual (bachelors) Degree programmes offered by some universities of applied sciences in Berlin involve partnerships with employers to train engineers and give them practical technical and management skills.

Much of this work lacks strategic anchoring within the higher education institutions and depends on the initiative of individuals or single departments. They are often not reflected in the curriculum development or budget allocation. There is a coordination deficit when a range of departments, individuals and structures are delivering their own activities. No system-wide data is publicly available on the extent to which academics or students in Berlin higher education institutions are engaged with business and the public sector through their normal teaching and related research. Institutional level data is also at a low level although there are some exceptions, particularly among the universities of applied sciences.

...Berlin has a good track record in graduate entrepreneurship and a rich support framework, but more work is needed to equip a larger group of students with entrepreneurial skills ...

Berlin's strong science base, cultural industries and creative people provide great potential for new entrepreneurship and entrepreneurialism. There is a high level recognition of the economic and social impacts of entrepreneurship. In 2008, Berlin ranked number two in Germany after Hamburg with 17 start ups per 100 000 inhabitants. Berlin has about 20 start-up centres that provide young technology-oriented enterprises with advice, services and spaces and the annual Business Plan Competition Berlin-Brandenburg, managed by the Berlin Investment Bank has enabled more than 4 000 business ideas to serve as basis for the creation of new companies.

Berlin higher education institutions have made significant progress to boost university spinoffs and graduate entrepreneurship in the region. All three research-intensive universities have established their own centres for entrepreneurship which bundle start-up support activities and promote entrepreneurship education activities. The universities of applied sciences have also established their entrepreneurship activities, for example Beuth-Higher School of Technology Berlin has a founders' shop Location4Innovation to facilitate graduate startups. Despite the efforts, entrepreneurship education in Berlin is in an early phase of development, reflected in the limited breadth and refinement of entrepreneurship education activities in the higher education institutions and a small proportion of students benefiting from them: only about 5-7% of the total student population in Berlin have access to entrepreneurship education. Significant measures are needed to enhance institutional anchoring of entrepreneurship education in higher education institutions, to build capacity

among and incentivise entrepreneurship educators and to integrate entrepreneurship education into the curricula. System-level incentives are required for enhancing collaboration between higher education institutions to build a resource centre in entrepreneurship.

The following measures would promote higher education institutions' contribution to human capital development in Berlin:

- A holistic Berlin regional development strategy should be developed with measures opening higher education to categories of the population which have been largely left aside up until now, including mature students, students with lower socio-economic and/or migrant backgrounds. The strategy should also better address the training and research needs of small and medium-sized enterprises. The challenge is to ensure the pursuit of quality teaching while increasing access of a socially and ethnically diverse population to higher education and seeking to conciliate the pursuit of world class research with increased initiatives to answer the needs of small firms.
- Wider portfolio of robust data, related to the regional context, and with the situation of individual higher education institutions taken into account should be developed in Berlin to support evidence-based decision making at higher education policy and institutional level. The most effective region-wide graduate labour market systems are based on the collection of comprehensive labour market intelligence. For example, the data should be published on-line, in a single site, to improve students' ability to make rational choices about their studies. This would also help graduates and employers to come together and increase students chances of moving onto employment. The resultant data could also be 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.
- Regional government, higher education institutions, other educational institutions and key stakeholders of the economy and society could usefully collaborate to agree on region-wide goals, policies and priorities concerning human capital development. Higher education institutions and regional government could establish for this purpose a higher education coordinating body to address pathways between higher education institutions and different levels of education. In particular, measures should be put in place to accommodate and encourage mobility within and between institutions by formal agreements, to help students to move from one institution to another, when justified.

- The Berlin Senate, higher education institutions, schools and the business sector should develop long-term efforts to increase the enrolment and success of students with migrant backgrounds. These efforts should build upon existing outreach to schools by higher education institutions and successful models of effective support services for students, including both academic and social supports and experiential learning. Professors and researchers with an immigrant background should be recruited to enhance higher education institutions' image while offering role models for many young people. Higher education institutions undertaking such recruitments should be rewarded.
- Incentive structures should be strengthened to encourage higher education institutions and their staff to engage in activities benefiting regional and local development and entrepreneurship activities. Discretionary funds should be established for supporting projects using various kinds of teaching-related activity which include interaction between the higher education system and the community.
- The labour market relevance of university education should be strengthened. In particular, systematic information could be delivered to secondary school graduates concerning sectors and careers with promising development in Berlin. Such an effort could be made in conjunction with job market analysts and the private sector.
- Higher education institutions' lifelong learning activities should be strengthened. The education system should pay greater attention to the upgrading of competencies in middle-level education, for example by establishing innovative approaches for bachelors not transferring to master programmes and for the upgrading of training in areas statistically counted in Germany as tertiary education. Short-term programmes for adults in employment or seeking employment could also be considered as an extension of vocational training or as specific courses offered by higher education institutions.

Social, cultural and environmental development in Berlin

Berlin is making progress in becoming a laboratory and a global test bed for innovation in environmental, social and cultural fields by transforming some of its challenges into assets that can provide opportunities for growth and development. As a “living laboratory” for public transportation and renewable energies Berlin and Brandenburg have acquired a competitive advantage, skills and know-how in sustainable urban development. Ongoing climate change is opening global market opportunities for Berlin’s services and products throughout the world...

Berlin has the capacity to play a global role in “green growth”. In the past five decades its transportation infrastructure has been redesigned and rebuilt three times resulting in the refurbishing of lines and equipment, modernisation of junctions and rebuilding of major stations. Environmental concerns have been integrated into public transport design and planning to limit the carbon foot-print of city transportation through innovative technical solutions and a vision of mobility requirements in a dispersed city. Additional critical mass has been acquired through collaboration with the Land of Brandenburg. The Berlin Senate supports active cluster development in transportation and renewable energies working jointly with Brandenburg drawing on the experience developed in this area by different organisations, higher education institutions and companies. For example, the Technische Universität Berlin (TUB), in Charlottenburg provides a valuable contribution to teaching, training and research in the different areas of transportation and logistics, while the science park in Adlershof supports the development of leading edge research in renewable energies.

...but the development of a “greener” economy in Berlin and Brandenburg will require greater facilitation of industry-university collaboration, avoiding duplication and fragmentation of efforts and also developing new skills for the “green jobs”...

The specific Berlin context since reunification has provided an opportunity seized by policy makers, higher education institutions and the private sector, giving the city a leading edge in strategic areas as compared to other global metropolises. However, it is necessary to enhance collaborative platforms for eco-innovation to ensure efficient exchange of information, to reduce duplication of efforts and to enhance adoption of “green” technologies by local industries.

The effectiveness in addressing climate change will depend on how the higher education institutions liaise with industry and civil society. To boost green growth, collaboration between higher education institutions and small and medium-sized enterprises should be facilitated. Some higher education institutions have already taken steps to address the needs of the small and medium-sized enterprises. For example the institute for the Promotion of Agricultural and Urban Ecological Projects (IASP), located in Humboldt University co-operates with small and medium-sized enterprises to transform innovation into marketable products. The Institute for Resource Conservation, Innovation and Sustainability (IRIS), at the Hochschule für Wirtschaft und Recht (University for Economy and Law studies Berlin), collaborates with regional firms to help them develop business processes and products in a sustainable manner. These initiatives should be scaled up and made more inclusive and open to other higher education institutions.

Finally, as the development of a “greener” economy in Berlin and Brandenburg will depend on the availability of skilled labour to fill the new jobs, extensive retraining and up-skilling as well as developing a diverse set of new skills will be necessary. Skill creation for “green” jobs could be more efficiently organised by pooling learning resources of educational institutions and industries in Berlin and enhancing pathways among institutions.

Berlin has a strong image as the European art capital and creative city which attracts talent and knowledge-intensive businesses. Its cultural and creative cluster enjoys strong political support in the city. The excellent network of educational and training institutions for creative professions guarantees Berlin's place as a centre of attraction for young creative individuals...

Berlin has a strong image as a creative city in terms of the scope and range of its cultural scene and the presence of artists and creative people. With nearly 170 000 employees, including freelancers and independent contractors, and more than 22 500 creative enterprises with a total turnover of EUR 18.6 billion, the cultural and creative industries are important to Berlin's economy making up about 20% of Berlin's GDP. The cluster contributes to the growth and development of Berlin through attraction and retention of talent and knowledge-intensive businesses. There are also promising signs of companies relocating in Berlin, for example Deutsche Telekom has moved its R&D department to Berlin. The opening of the Berlin-Brandenburg International Airport is likely to increase the attractiveness of the city.

The Berlin Senate has excelled in cluster development and networking in the cultural and creative industries. As a joint project of the Senate Department for Economics, Technology and Women and the Department of Culture, the Cultural Industries Initiative has adopted an integrated course of action to bring together public and private sector and the non-profit organisations, associations and foundations to enhance the exchange and value creation. In addition, one of Berlin's competence fields, *i.e.* IT and media, belongs to a large extent to the creative industries. The Berlin Investment Bank has increased its commitment to financing this cluster.

Berlin has an excellent network of publicly supported educational and training institutions for creative professions, including four internationally renowned art schools, universities, universities of applied sciences, technical colleges as well as 36 vocational schools that offer training in the creative professions. In addition, there are various private educational-training providers. These institutions guarantee Berlin's place as a centre of attraction for young creative individuals throughout Germany. Moreover, a number of centres have been established in collaboration with various higher education institutions. These include the Cooperative Jazz Centre in Berlin

(founded in 2005) and the Cooperative Dance Education Centre which was established in 2006 at the initiative of the Berlin Senate and has gained recognition for its innovative model of collaboration and institutional anchoring.

...but challenges remain in the cultural and creative industries to provide better further education opportunities as well as entrepreneurial and multidisciplinary skills for graduates. Greater collaboration is needed to bring together creative industries, art education and technology and to reduce administrative constraints that may limit collaboration...

Although the level of qualifications and training in art and culture is at a high level in Berlin, a number of challenges remain. Further education opportunities do not meet the need of the diverse sector, especially those freelancers involved in creative professions. Entrepreneurial education appears under-developed in view of the large number of graduates who become self-employed. Moreover, course provision is not yet sufficiently multidisciplinary and ICT-based. Finally, the collaboration between creative industries, art schools and technical universities is often constrained by differences in institutional cultures and administrative regulations. In practice, for example launching new educational programmes can be both time consuming and cumbersome. Learning from international examples to boost interdisciplinary collaboration in creative industries would be helpful.

...Berlin's Neighbourhood Management Programme has the capacity to become a new "export article" for the Berlin. Higher education institutions could support its activities, for example through targeted action research on its immigration experience and ethnic entrepreneurship programmes. Higher education and research should be used to strengthen social inclusion and encourage ethnic entrepreneurship...

Berlin's neighbourhood management programme *Quartiersmanagement*, provides a framework for community development within the city. The programme, which is co-financed by the Federal government and the *Länder*, with the EU contributing around 30%, coming from the Regional Development Fund, embraces 35 city areas in Berlin, mostly in the

centre of the city, with large migrant populations and high numbers of people on transfer payments. To date, the involvement of Berlin higher education institutions in the neighbourhood management activities has been relatively limited and linked to evaluation, student internships and academic events. More could be achieved through collaboration between higher education institutions and by scaling up interventions currently driven by individual academics and departments. This would enable higher education institutions to excel in research about Berlin's immigration experience and public policy in a number of relevant spheres, for example in education, housing and employment. In addition, such applied research could help to boost ethnic entrepreneurship. *Bildung im Quartier* (BIQ) ("Education and training in the neighbourhood") is one of Berlin's five local regeneration projects implemented through the Neighbourhood Management Programme. It would provide an opportunity for much stronger engagement by Berlin higher education institutions through applied research, work-based learning and labour insertion of graduates.

The following measures would enhance the contribution of higher education institutions to the social, cultural and environmental development in Berlin:

- A systematic exchange of information and experience should be put in place between higher education institutions in terms of environmental sustainability, urban regeneration and integration of migrants, and cultural industries facilitated by the Senate and clusters around the fields of contribution 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 higher education institutions. Such a forum could organise thematic events, with regular information retrieval and exchange facilitated by a dedicated website. As a first step, higher education institutions' current connections, initiatives and projects involving stakeholder collaboration, community development and/or outreach should be mapped and published in the collaboration platform.
- In view of climate change, Berlin should capitalise on its accumulated know-how and wealth of experience in public transportation and increasingly promote renewable energies openings into global market opportunities. Higher education institutions and industry collaboration should be enhanced, for example through targeted innovation vouchers for small and medium-sized enterprises. Collaborative platforms for eco-innovation, like Knowledge Transfer Partnerships in the United

Kingdom, could bring forward more efficient exchange of information, reduce duplication of efforts and enhance the adoption of new technologies by local industries. Skill creation for green jobs should be more efficiently organised by pooling learning resources of educational institutions and industries in Berlin and Brandenburg and providing flexible pathways between educational institutions.

- In cultural and creative industries Berlin should, in collaboration with educational institutions and the public and private sectors, increase its efforts to support entrepreneurial skills among students and graduates and better further education opportunities. Multidisciplinary collaboration across higher education sectors and different institutions should be encouraged through reducing red tape and encouraging the establishment of joint institutes, departments and institutions.
- Berlin should, in collaboration with higher 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. In addition to increasing efforts to widen access to higher education and improving retention rates, higher education institutions should also reach out and empower the migrant population to address their own challenges through community development programmes. One way of mobilising higher education institutions could be through Berlin's Neighbourhood Management Programme in areas with a high proportion of migrants and people on transfer payments. Higher education institutions could support the Quartiersmanagement activities, such as *Bildung im Quartier* ("Education and training in the neighbourhood"), and through targeted action research on Berlin's immigration experience and ethnic entrepreneurship programmes.

Capacity development in Berlin

The Berlin Senate has pioneered capacity building for regional development through cluster based networking and urban spatial development. But collaboration within and between higher education institutions remains a challenge. There is a need to bring together the Berlin's higher education and research institutes and the Senate to consider how best to respond to the big challenges facing the metropolis...

Traditions of partnerships within the city or region between higher education institutions, businesses, regional agencies and government bodies, is a critical factor in attracting foreign direct investment and partnering with other regions and higher education institutions globally. The Berlin Senate has contributed to capacity building in various ways, for example through supporting networking in the fields of expertise and through urban spatial development. This includes the establishment of Charité, the joint medical school between the Technical University of Berlin and Free University of Berlin and its campus adjacent to the Buch science park in the north east sector of the city; the relocation of Humboldt University's science faculty from the city centre to Adlershof in the south-east sector of the city; and the mergers leading to the creation of the Hochschule für Technik und Wirtschaft Berlin (University of Applied Sciences for Technology and Economy), with two campuses in the eastern part of the city.

Despite the networking facilitated by cluster development, the participation of higher education institutions in fora linked to local and regional development appears fragmented. There is scant information about involvement in activities related to regional development or social integration. Diverse programmes and projects involving higher education institutions appear to be built on separate and non-coordinated initiatives stemming from specific circumstances rather than from an overarching vision of needs. Tackling deep-seated spatial as well as social disparities in Berlin remains a challenge and the presence of higher education facilities in different locations across the city can contribute significantly to this task.

With continuing financial pressure there is a need for an *ad hoc* albeit informal structure where the city's higher education and research institutes

can meet with one another and with the Senate to consider how best to respond to the significant challenges facing the metropolis, including spatial development and human capital development and which require well-functioning educational pathways between the institutions and different levels of education.

...stronger incentives are needed to mobilise higher education institutions and their staff for local and regional development...

Higher education institution's culture, capacity for change, leadership and appropriate co-ordination mechanisms play an important role in their capacity for partnership building and collaborative action. In Berlin, the incentive structures for mobilising research-intensive universities for regional and city development are limited. There is no explicit "third task" or regional development task assigned to them and regional engagement is left to the initiative of the individual institutions. The principal driver of research-intensive universities is scientific excellence and/or its applicability to business competitiveness wherever firms may be located. While the universities of applied sciences usually have close links to the labour market and also local and regional development, they are constrained by their limited capacity in terms of time and money.

There are few direct funding mechanisms to stimulate regional engagement of higher education institution in Berlin. So far, the Berlin Ministry of Education, Science and Research has used its core funding resources to steer universities towards regional engagement in a limited way, for example the new contract funding arrangements introduced in 2008 have not embraced an engagement agenda for the Berlin higher education institutions.

In terms of institutional management, Germany's research-intensive universities give a major role in institutional decision-making to academic staff, but limited influence to external partners. The "Initiative for Excellence" is a national top-down programme involving the central government's thrust to improve the quality of research in higher education institutions and at the same time also change the way universities work. It supports new concepts for organising and enabling cutting edge research at universities. From the perspective of regional engagement of higher education institutions, it can divert the institutions from their regional tasks. In Berlin, the initiative is bringing research-intensive universities and research institutes closer together and improving collaboration. In the absence of a more profound higher education reform, there is a risk that

while a new more responsive and entrepreneurial “layer” is developed within the institutions, the academic heartland is left untouched.

The following measures would build capacity for regional development in Berlin:

- The mission of higher education institutions to engage locally and regionally, and specifically to contribute to economic, social and cultural development, should be made explicit in higher education legislation.
- Appropriate career and/or financial incentives should, where possible, be made available to encourage and reward academic staff engaged in local and regional development.
- The Berlin Senate should seek every opportunity to mobilise the higher education sector for local and regional development by creating incentives. This could be done in the form of long term core funding and additional strategic incentive-based funding schemes. Incentives for higher education institutions should be aligned to support regional development objectives in the form of time and money. The Senate now rewards universities both for winning academic research contracts and for work commissioned from specific users. This is a step in the right direction. In addition, for universities, stronger incentives are needed to ground international excellence and research in the city with regional benefit. For the universities of applied sciences, academic time should be available to undertake user-orientated research, otherwise, the financial incentives may have limited impact on the extent and scale of external engagement.
- The current costs of accountability of higher education institutions should be audited to identify and quantify the burden that it imposes on universities as well as the potential to ameliorate it by data sharing, raking assurance from the work of others and a risk-based approach to assurance.
- The Berlin Senate in collaboration with is key stakeholders including the higher education institutions should establish a clearly articulated long-term integrated strategy for economic, social, cultural and environmental development of the city. Such a vision and underpinning strategy is a fundamental prerequisite to a fully-fledged engagement between the city and higher education and research.

- The Berlin Senate, higher education institutions, other educational institutions and key stakeholders of the economy and society should work together to establish a Regional Higher Education and Research Strategy which connects top-down high-level strategies and bottom-up initiatives and to guide the development of the overall higher education system to optimise its impact on the city. A forum linked to this strategy should enhance the dialogue between higher education institutions and the city regarding their interaction, help understand the drivers of each group and organise capacity building through targeted leadership development programmes for those filling “boundary spanning” roles between higher education and the wider society. The programmes should focus on developing skills in a collaborative manner through addressing practically some of the major challenges facing the city.
- Lateral co-ordination between higher education institutions and the Senate’s various areas of responsibility could be strengthened in different ways. The Berlin Board could be developed into a forum where the wide ranging contributions of higher education to the city could be articulated, highlighting inter-connections between these areas and links to the various ministries which could contribute to and gain from the work of higher education institutions. The Berlin Investment Bank (Investitionsbank Berlin), which provides a well-resourced business-oriented and specialised development vehicle, could also be developed into a single delivery agency in the field of economic development, empowered to mobilise the support of higher education institutions and strengthen links with the business community.
- Clear links should be established between city regeneration and spatial planning and mobilisation of higher education to support city development. Geographical proximity can be a catalyst for supporting links between higher education and business through both research and teaching. Adlershof is a success story and will become an even more significant innovation hub in south-west Berlin with the relocation of the airport. The linkages between the research institutes facilitated by the IGAFAs (Joint Initiative of Non-University Research Institutions in Adlershof) and underpinned by the management and marketing of WISTA (Park of Science and Technology Adlershof) are models of good practice. A similar hub needs to be developed at Buch and at Charlottenburg (perhaps under the umbrella of a single organisation built around WISTA). These hubs need to handle transport, housing and community relations issues as well as being underpinned by strong higher education and business intermediary organisations. This could be a task for a strengthened Berlin Investment Bank (Investitionsbank Berlin).

- Evidence-based decision making should be strengthened in the region by focusing on a dashboard of key performance indicators to assist managers and funders to steer higher education institutions and the overall system. This can result in a shared local knowledge base which will galvanise the development of a strong local strategy for change. Care should be taken to avoid accountability burden and over-emphasis on what can be measured (e.g. patents, licenses and spin outs) rather than what matters (e.g. creativity or social innovation) and lagging indicators (what has happened) rather than leading indicators (e.g. building capacity to act in the future).
- Higher education institutions should review recruitment, hiring and reward systems to include regional development agenda. They should create systematic mechanisms to monitor and evaluate their activities in this area, to share good practice within the institution and benchmark this experience with other organisations and localities. In addition, they should invest in developing the skills of facilitators, i.e. those with boundary spanning roles who help create links between the higher education institution and other stakeholders.

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 Berlin in Germany (<http://www.oecd.org/dataoecd/20/5/46006840.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.