



OECD LEED REVIEWS

Universities, Entrepreneurship and
Local Development

MORAVIA-SILESIA, CZECH REPUBLIC



ENHANCING THE
LOCAL DEVELOPMENT
CONTRIBUTIONS OF
HIGHER EDUCATION
INSTITUTIONS

**IN COLLABORATION WITH MINISTRY OF EDUCATION, YOUTH AND SPORTS OF
THE CZECH REPUBLIC**

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Design: Joseph Tixier, OECD*

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OF HIGHER EDUCATION INSTITUTIONS
IN MORAVIA-SILESIA, CZECH REPUBLIC"**

REVIEW REPORT

AUGUST 2014

Acknowledgements

This review of the contributions of higher education institutions to local development in the Moravia-Silesia region in Czech Republic would not have been possible without the contributions, commitments and dedication of many people.

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Jaana Puukka, former OECD analyst, has played a crucial role in getting this review started. She was part of the international review team as core expert and prepared the chapter on the policy framework and institutional level impacts as well as the draft version of this report.

Petr Kolář from the Jan Amos Komensky University in Prague prepared a substantial background report. Patrick Dubarle, former OECD principal administrator, Maite Martinez-Granado, economist working at NAIDER in Spain, Tomas Karlsson entrepreneurship education researcher and professor at Chalmers University of Technology, and Jakob Stolt, expert-advisor at the University of Aalborg in the Copenhagen Campus in Denmark were other members of the international review panel and authors of different chapters of this report. Andrea-Rosalinde Hofer, economist at the OECD, led the review team and edited the final version of this report.

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AUTHORS' NOTE

This report is the result of a one-year collaboration between the Local Economic and Employment Development Programme (LEED) of the Organisation for Economic Co-operation and Development (OECD) and the Ministry of Education, Youth and Sports of the Czech Republic. The aim of this collaboration has been to undertake a review of the current and potential contributions of higher education institutions to local and regional development in Moravia-Silesia region, identifying key opportunities and obstacles and providing recommendations for future action – both at public policy level as well as targeted directly at the higher education institutions and their local partners.

Moravia-Silesia offers an interesting case, which regions elsewhere in the OECD area can learn from. It hosts five higher education institutions, of which three are public universities – the Technical University of Ostrava, the University of Ostrava, and the Silesian University in Opava – and the remaining two, the Business School of Ostrava and the College of Social and Administrative Affairs, are private higher education institutions. There is abundant room for collaborative action, especially with regard to research, innovation and the promotion of entrepreneurship. But, as also the case for many regions and cities around the world, barriers are in place which renders acting upon opportunities for collaboration difficult.

The review has focused on the current and potential contributions of higher education institutions to local and regional development, identifying key obstacles and opportunities, in particular with regard to:

- Human capital and skills (Chapter 1 by Maite Martinez-Granado, NAIDER, Spain)
- Research, development and innovation (Chapter 2 by Patrick Dubarle, former OECD principal administrator, France)
- Entrepreneurship development through education activities (Chapter 3 by Tomas Karlsson, Chalmers University of Technology in Sweden), and through start-up support provided within and in proximity to higher education institutions (Chapter 4 by Jakob Stolt, Aalborg University in Denmark)
- National higher education policy framework and the governance of higher education institutions (Chapter 5 by Jaana Puukka, former OECD Analyst, Innovation Engage, France)

The review methodology included an external expert assessment, conducted by an international review team, whose members were selected by the OECD. During a one-week study visit from 17-22 November 2013, interviews, round-table meetings and focus groups were organised involving 160 representatives of key local stakeholders (see list of interview partners in Annex). Petr Kolář from the Jan Amos Komenský University in Prague prepared a substantial background report with profiles on the five higher education institutions in the region and other key development stakeholders. Key findings from the interviews and the analysis of additional documentation were presented in an intermediate report in January 2014 and sent to all interview partners for comments.

Jaana Puukka prepared a draft version of this report and edited it together with Maite Martinez (Naider). Andrea-Rosalinde Hofer (OECD) prepared and edited the final version of this report, which was presented in dissemination events on 8-9 October 2014 in Ostrava and Prague.

TABLE OF CONTENTS

AUTHORS' NOTE.....	5
INTRODUCTION.....	9
Organisation of the report.....	9
A brief overview of Moravia-Silesia's economy	10
Higher education in Moravia-Silesia	11
References.....	13
CHAPTER 1 HUMAN CAPITAL DEVELOPMENT AND SKILLS.....	14
Introduction.....	14
Findings	15
Recommendations.....	28
References.....	36
CHAPTER 2 RESEARCH, DEVELOPMENT AND INNOVATION	38
Introduction.....	38
Findings	38
Recommendations.....	44
References.....	51
CHAPTER 3 ENTREPRENEURSHIP EDUCATION.....	53
Introduction.....	53
Findings	54
Recommendations.....	59
References.....	65
CHAPTER 4 START-UP SUPPORT.....	67
Introduction.....	67
Findings	69
Recommendations.....	72
References.....	76
CHAPTER 5 NATIONAL HIGHER EDUCATION POLICY FRAMEWORK AND INSTITUTIONAL-LEVEL EFFECTS.....	78
Introduction.....	78
Findings	79
Recommendations.....	86
References.....	93
SUMMARY OF FINDINGS AND RECOMMENDATIONS	95
The role of HEIs in human capital and skills development in the region.....	95
The role of HEIs in research, innovation and development in the region	101
The role of HEIs in boosting entrepreneurship through education and start-up support.....	105
National framework conditions and institutional effects	112
ANNEX.....	117
About the contributors	117

Interview partner during the study visit 18-22 November 2013.....	120
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Tables

Table 1. Tertiary Higher Education Institutions in Moravia-Silesia	11
Table 2. Number of students in HE, 2001-2012.....	16
Table 3. Number of students in HE, 2001-2012.....	16
Table 4. Mobility across universities: number of participants in exchange programmes	25
Table 5. Moravian-Silesian HEIs in the Scimago ranking (2012).....	40
Table 6. MSK HEIs' research funding (M EUR), 2012	42

Figures

Figure 1. NEETS, 18 to 24 years, 2009-2012.....	16
Figure 2. Unemployment rate of 25-64 years old, by educational level, 2005-2012.....	17
Figure 3. Unemployment rates by HE degree in Moravia-Silesia, 2002-2013.....	18
Figure 4. Unemployment rates for graduates selected Czech universities (averages for 2009-2013)	19
Figure 5. First-year Bachelor studies drop-out rates (% , 2001-2012)	22

Boxes

Box 1. Industrial relations of the HEIs in Moravia-Silesia.....	19
Box 2. VSB-TUO Career Service.....	21
Box 3. Competencies for Life project.....	24
Box 4. Collaboration between VSB-TUO and UO.....	26
Box 5. The MS Pact for Employment.....	27
Box 6. VSB-TUO collaboration with schools	27
Box 7. LANBIDE and the Basque Observatory for employment of graduates (ES).....	28
Box 8. Box 2. DIT Access Service	29
Box 9. World of Work at Liverpool John Moores University (UK)	30
Box 10. Box 4. Mendeberry at Mondragon University (ES).....	32
Box 11. Excellence Tandems at the Beuth Hochschule in Berlin (DE)	33
Box 12. Motivating language learning: University of Warsaw System of Language Provision (PL).....	35
Box 13. Uneven but diversified R&D potentials of HEIs in Moravia-Silesia.....	39
Box 14. VSB-TUO Innovation Support Centre (Centrum podpory innovaci, CPI)	43
Box 15. The DRESDEN Concept (DE).....	44
Box 16. Research Consortium of Finnish Universities (FI)	45
Box 17. Forum function roles of universities: creating public spaces	46
Box 18. The Knowledge House – a collaborative network to support SMEs (UK)	46
Box 19. Project Exchange at the University of Almeria (ES)	46
Box 20. Kitakyushu: how to build a green & vibrant city (JP).....	47
Box 21. Rotterdam University's Innovation Labs (NL)	48
Box 22. ICREA –Catalan Institution for Research and Advanced Studies (ES).....	48
Box 23. Fast Forward: Creating Opportunities for Graduates to Stay (NL).....	51
Box 24. Food simulation game at VSB-TUO business school.....	56
Box 25. Entrepreneurship education practices in HEIs in Moravia-Silesia.....	57
Box 26. Lund University: traditional university shifts its focus (SE).....	59
Box 27. Aalborg fighting off periphery by co-locating in Copenhagen	60
Box 28. Student centred learning at Maastricht University (NL)	61
Box 29. Aaltoes – students promoting entrepreneurship (FIN)	62
Box 30. First Lego League	63
Box 31. Students boosting research results at Chalmers School of Entrepreneurship (SE)	63

Box 32. Host company work at Jönköping International Business School (JIBS) (SE)	64
Box 33. Promising start-up support initiatives in Moravia-Silesia.....	71
Box 34. Organising a charity event instead of sitting an exam at Dublin Institute of Technology (IE).....	72
Box 35. Education programmes and online resources for family businesses	73
Box 36. Copenhagen School of Entrepreneurship, CSE (DK)	74
Box 37. Gate to Create – the power of entrepreneurial student organisations in Denmark.....	75
Box 38. Funding for public HEIs for educational activities	82
Box 39. The Role of the Czech Accreditation Commission	84
Box 40. The Higher Education Innovation Fund, HEIF, and Higher Education and Business Interaction Survey, HE-BCIS (UK).....	87
Box 41. Performance contracts in Austria mobilise universities for regional RIS3	88
Box 42. Stimulating voluntary giving. Matched funding scheme for charitable donations to universities (UK)	89
Box 43. Kentucky Regional Stewardship (US)	90
Box 44. The University Rovira i Virgili - a long-term commitment to the economic transformation and industry specialisation in Southern Catalonia (ES).....	92

INTRODUCTION

The introduction fulfils two purposes. Firstly, it informs the reader about the structure of the report and what can be expected from subsequent chapters. Secondly, the chapter presents Moravia-Silesia, its main socio-economic features and its higher education system and outlines the key challenges that the region and its higher education sector face.

Organisation of the report

Higher education institutions are expected to play a key role in the development of cities and regions. Today, more than ever in their history, higher education institutions are being judged by the ways in which they respond to the social and economic needs of society, that is, how they are facilitating social mobility and wider access to higher education for disadvantaged groups, their actions to enhance graduate employability, their short- and long-term contributions to national economic growth and local development, and the ways in which they are stimulating the birth of new enterprises and innovation in existing firms (HEInnovate, 2014).

This report is discussing the role of higher education institutions in three main areas. Firstly, **graduate employability** (Chapter 1), and the synergies needed between education, research and practice to result in more network structures between higher education institutions and their employment contexts. Secondly, **research, development and innovation and their embeddedness in knowledge exchange**, examining the role of universities, which goes being a mere source of experimentation and innovation, underlining the importance of community involvement as a way to get new ideas for research and test results in response to societal and local challenges and opportunities (Chapter 2). Thirdly, in **promoting entrepreneurship**. Worldwide, the number of higher education institutions who provide entrepreneurship support for their students, graduates, researchers and professors is growing. That encompasses both *entrepreneurship education* (Chapter 3), with its two main objectives of generating motivation and attitudes for entrepreneurship and the skills and competencies needed to successfully start-up and grow a business, and the *provision of start-up support* (Chapter 4). Especially for the latter, different strategies have been advanced by HEIs and tailored practices emerged in helping future entrepreneurs to take their first steps in starting-up and growing a business.

Higher education institutions are conditioned in their performance in these three areas by the **national policy framework**, the **socio-economic conditions surrounding them**, as well as by their **internal governance** and their **approach towards stakeholder collaboration and involvement**. The latter, also including links with other higher education institutions located in the same territory. These conditioning factors are interlinked and impact the leadership and organisational capacity of a higher education institution. All this is discussed in Chapter 5.

All chapters of this report have been written as self-containing documents. They are structured in the same way presenting in a first part review findings, that is, key strengths and weaknesses. This is followed by a set of recommendations intended for further expert discussions at local, regional and

national levels. The chapters conclude with brief presentations of good practice examples from other countries which serve as learning models, proving inspiration for future action at local and national levels. The chapters – especially chapters 1-4 are not meant to draw-up an exhaustive picture of the local scenario, leading to immediate and concrete actions. The aim of this report is, rather, to stimulate and catalyse a process, whereby higher education institutions and their (potential) partners at local, regional and national levels can stand back and reflect on their overall options, needs and priorities, and get inspiration on what could be done – also in terms of the "why" and "how" from the learning models.

A brief overview of Moravia-Silesia's economy¹

Moravia-Silesia, located in the north-eastern part of the Czech Republic, along the borders with Poland and the Slovak Republic, is the country's third most populated region. The region has 1.2 million inhabitants, accounting for 11.7% of the national population. Ostrava, the region's capital, has approximately 300 000 inhabitants, of which around 10% are students enrolled in the five higher education institutions.²

During the last decade the region has suffered from a continuous population decline. Between 2005 and 2012, the total population in the region shrank by 2.1%, and by 11.3% for the age group 20-34 years. The negative migration balance is predominantly due to the outward migration of the highly educated and the young. The limited supply of attractive jobs is fuelling this brain drain.³ Furthermore, the region's old-age-dependency ratio is increasing (22.7% in 2011).⁴ These demographic trends have threatened the region's competitiveness.

Moravia-Silesia is one of the country's most industrialised regions; it accounts for around 10% of the national GDP. The former strong focus on coal, iron and steel production, is now being replaced by the automotive industry and several cluster.⁵ In 2010, industry as a whole employed around 35% of the occupied population, which is above the national average (28.5%). Mining and manufacturing are still sectors with high employment rates. At the same time, restructuring in these sectors is ongoing and expected to lead to a significant reduction in the amount of jobs provided by these sectors. The competitive advantages of the past – low salaries and a very low level of environmental accountability – have largely vanished and left the regional economy facing the risk of a gradual loss of price competitiveness due to a dependency of its export performance upon global commodity prices of steel, iron and coal.

¹ The data in this section draws on the Annex 2 Analysis of key development characteristics of the Moravian-Silesian Region in Regional Government of Moravia-Silesia (2009), Regional Development Strategy 2009-2020.

² Students account for 3.5% of the population in the region.

³ Results from the survey "Mapping of views on the current state and development needs of the Moravian-Silesian Region"

⁴ While this figure is still below the national average (23.4% in 2011) and the EU-27 average (26.2%), the region has experienced since 2000 an almost twice as large annual increase in this ratio as the EU and 1.5 as large as the Czech Republic in general.

⁵ In the end of 2013 the region hosted 10 clusters: the National Mechanical Engineering Cluster, the Moravian-Silesian Automotive Cluster, the Moravian-Silesian Wood Processing Cluster, the Moravian-Silesian Energy Cluster, the IT Cluster, the Envicrack Cluster, the Moravian Forestry Cluster, the Safety Technology Cluster, the Tourism Cluster, and the Knowledge Management Cluster.

Foreign direct investment (FDI) and multinational companies are the main engines of economic growth and structural changes in the Czech regions. While more than half of the volume of incoming FDI goes to Prague, Moravia-Silesia has received 115% of the national average of FDI without Prague, but the structure of FDI is dominated by investment into the construction of mass production and assembly with only little or no attention to knowledge intensive sectors.

Moravia-Silesia has one of the lowest number of registered firms per 1 000 residents in the country (197 compared to the national average of 245). The region lags behind also in the net creation of individual businesses (sole proprietorships included). Between 1998 and 2008, the number of business owners increased by 13.5%, compared to the national average of 17.6%. Moravia-Silesia also has the lowest number of business owners⁶ who earn more than CZK 1 million (23 in 2008 representing 78% of the national level). The share of companies having introduced product innovations new to the market is below the national average.⁷ The local economy offers a low supply of jobs for highly skilled employees and has a low demand for R&D, with a R&D capacity per 1 000 residents significantly lower than the national average. R&D expenditure of the business sector on value added amount only to 70% of the national average, and R&D activities funded by companies reaches only 42% of the country's average. In 2007, Moravia-Silesia reached an intensity of R&D expenditures of approximately half (measured by the share in GDP) of what it was for the Czech Republic as a whole. The number of researchers employed in the corporate sector is below the national average, but slightly above-average in the non-business sector due to the concentration of higher education institutions in Moravia-Silesia. The latter also grows at a faster rate than in the corporate sector.

Higher education in Moravia-Silesia

Since the Velvet Revolution in 1989, the number of tertiary education institutions in Moravia-Silesia has grown to five higher education institutions and 13 tertiary professional schools. The Moravian-Silesian higher education sector consists of three public universities which offer ISCED Type-5A programmes (Bachelors and Masters) and advanced research qualifications (doctoral programmes, Type 6) and two significantly smaller private institutions offering Type-5A programmes. Tertiary professional schools offer Type-5B programmes and are not considered part of the higher education sector in the Czech Republic.⁸

Table 1. Tertiary Higher Education Institutions in Moravia-Silesia

Name	Location	Year of establishment	Type	General orientation
Technical University of Ostrava. (VSB-TUO)	Ostrava	1849	university, public	Technical
University of Ostrava (UO)	Ostrava	1991 (1959)	university, public	comprehensive
Silesian University in Opava (SUO)	Opava, Karvina, Krnov	1991	university, public	comprehensive

⁶ Calculated as the number of natural persons owning a business per 1 000 residents.

⁷ Regional Innovation Scoreboard 2014.

⁸ In Moravia-Silesia 13 tertiary professional schools offer programmes for the tourism and hotel industry, in economics and law, computer science, healthcare, agriculture and ecology.

Business School of Ostrava (BSO)	Ostrava	2000	non-university, private	Business
College of Social and Administrative Affairs (CoSaAA)	Havířov	2007	non-university, private	Administration

Source: Ministry of Education, Youth and Sports.

VSB-Technical University of Ostrava

With its history beginning as early as 1849, VSB-TUO is the fourth largest university in the Czech Republic, with 20 835 students in 2012. The Technical University of Ostrava (VSB-TUO) is the oldest and biggest university in the region. VSB-TUO was founded in 1849 and is the fourth largest university in the Czech Republic, with 20 835 students in 2012. With historically close linkages with mining and the related heavy industries, VSB-TUO has today seven faculties (Faculty of Economics, Faculty of Civil Engineering, Faculty of Mechanical Engineering, Faculty of Electrical Engineering and Computer Science, Faculty of Mining and Geology, Faculty of Safety Engineering, and Faculty of Metallurgy and Materials Engineering) and two all-university study programmes. VSB-TUO offers education in technical and economic fields in 124 study programmes, including 72 which are delivered in a foreign language. VSB-TUO is in the process of developing a strong focus on research and has successfully tapped into EU funding streams.

University of Ostrava

The second largest HEI in Moravia-Silesia is the University of Ostrava (UO) with 10 637 students in 120 programmes and 697 academic staff. UO was founded in 1991, but its origin goes back to the Pedagogical Institute in Ostrava (1959), a teacher training centre which became an independent Faculty of Education in 1964, offering degrees for primary school teachers. UO has a strong focus on the study and research in humanities and social sciences and recently also medicine, balancing, in this way, the VSB-TUO's technological offer. The UO has six faculties – the Faculty of Social Studies, the Faculty of Fine Arts, the Faculty of Arts, the Faculty of Medicine, the Pedagogical Faculty, and the Faculty of Science – and two independent research institutes which focus on niche areas.

Silesian University

The Silesian University in Opava (SUO), established in 1991, is the only public university in the Czech Republic founded after 1989 which is entirely self-standing with no linkages to previously existing institutions, which could be considered its predecessor. The Silesian University in Opava (SUO), established in 1991, is the only university in the Czech Republic founded after 1989 which is entirely self-standing with no linkages to previously existing institutions, which could be considered its predecessor. In 2012, SUO enrolled 7 952 students in 63 study programmes mainly in natural sciences, social sciences and economics. SUO operates in two city campuses: one in Opava city, with the Faculties of Philosophy and Science, the Faculty of Public Policy and the Institute of Mathematics, and another one in Karvina city, which is the seat of the School of Business Administration, the oldest and largest part of the university. The Extramural Instruction Centre in Krnov city is a scientific, teaching and information division of the university, focused on training and lifelong learning. It is also an accredited institution of the Ministry of Interior, for educating civil servants in the public administration, and of the Ministry of Education, Youth and Sports of (MEYS) for implementing retraining and further education programmes.

Business School Ostrava

The Business School Ostrava (BSO) is a one of the oldest private higher education institutions in the Czech Republic, accredited in 2000. Its mission is to cultivate entrepreneurship and support those who want to do business with social responsibility. BSO has five accredited bachelor programmes with 1 194 students in 2012.

College of Social and Administrative Affairs in Havířov

The second private⁹ institution in Moravia-Silesia is the College of Social and Administrative Affairs in Havířov (CoSaAA). It was accredited as a higher education institution in 2007 and began its operations in 2008. Today, it has approximately 347 students in the Bachelor programme Economic Policy and Administration, with two specialisations: Public Economics and Administration, and Management of Social Affairs.

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HEINNOVATE (2014), The Entrepreneurial Higher Education Institution: a Review of the Concept and its Relevance Today. Published by the European Commission and the OECD LEED Programme at www.heinnovate.eu.

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Data from Czech Statistical Office, Eurostat Regional Statistics and Ministry of Education, Youth and Sport.

⁹ After 2000, three private higher education institutions were founded in Moravia-Silesia.

CHAPTER 1

HUMAN CAPITAL DEVELOPMENT AND SKILLS

Maite Martinez-Granado

This chapter examines how effectively the higher education sector contributes to meeting the needs of the population and Moravia-Silesia's economy in terms of opportunities for skills and human capital development and the relevance of skills and competencies. It identifies the main challenges in the skills development system with a particular focus on higher education. The key message is that despite significant progress in human capital and skills, Moravia-Silesia needs to make better use of the skills of its population, improve the relevance of skills, and retain skills and talent in order to mitigate the impacts of ageing and increasing global competition. Higher education institutions have a major role to play in meeting these challenges.

Introduction

Moravia-Silesia's population is shrinking because of out-migration and ageing. The long term demographic transition will negatively impact labour supply and dependency patterns causing growing skill shortages. Out-migration concerns especially the young either during higher education or upon graduation. The region's old age dependency ratio has increased from 17.5% to 22.7% in the period 2000-2011. While it remained below the national (23.4%) and EU-27 averages (26.2%, both 2011), the per annum increase in Moravia-Silesia was almost twice as large as in the EU-27 area and 1.5 as large as for the Czech Republic as a whole.

The changes in the region's population also affect the capacity of the regional economy to handle its key challenge: to transition from an economy largely based on heavy industry to a knowledge economy in which higher education institutions play a crucial role. Moravia-Silesia's competitive advantages – relatively low salaries and a very low level of environmental accountability – will disappear in the medium run.

Within this context the higher education institutions and professional tertiary schools can contribute to the human capital and skills development in Moravia-Silesia by:

Some of the key questions that higher education institutions and policy makers at local, regional and national levels need to ask with regard to the coherence of HE policies and the role that HEIs play in human capital and skills development are:

- How well does the HE sector in Moravia-Silesia ensure wide access to and improved success for youth and adult population as key pre-conditions for a growth of the skilled workforce and an increase in the demand for more sophisticated products?
- To what extent does the HE sector produce graduates with knowledge and skills relevant to the regional and global economy? This may occur through academic and vocational programmes, internships and other programmes that link work experience with formal study.
- How well does the HEIs attract and retain talents to the region, including students and highly-qualified faculty and researchers, in order to strengthen the human capital stock? This includes talent across a wide range of fields.

- To what extent do the HEIs contribute to the development of an economy that will employ graduates and attract and retain an educated population through strategic co-operation to foster business development and entrepreneurship? This question will be partly addressed in the current chapter, but also in other chapters.
1. In responding to these challenges, the following key issues need particular attention:
- A mismatch between the supply and demand of skills
 - Low involvement of regional employers in the design and implementation of study programmes
 - High drop-out rates
 - Insufficient tracking and monitoring of graduate employment outcomes
 - Poor levels of soft skills attainment
 - Scarce international exposure and weak command of foreign languages
 - Limited take up of the opportunities for increased inter-HEI collaboration and collaboration between higher education and tertiary professional education providers.

Findings

Achievements in human capital development

As elsewhere in the Czech Republic, higher education enrolment and attainment rates in Moravia-Silesia have rapidly increased in recent years. The share of the population aged 30-34 with higher education (ISCED 5B, 5A, and 6) grew from 15.8% in 2009 to 23.6% in 2012, compared to the national averages from 17.5% to 25.6% respectively. Although these figures significantly lag behind the EU average (32.2% in 2009 and 35.8% in 2012), the Czech Republic in general and Moravia-Silesia in particular have experienced a much faster growth rate in HE attainment levels than EU-average. In terms of the share of people with university education in the age group 15+, Moravia-Silesia ranked in 8th place in 2007 with a value of 9.4% among all the Czech Republic regions.

The increase in the number of students in Moravia –Silesia (and the country in general) has been boosted by national higher education funding policies, the number of students in Moravia-Silesia almost doubled between 2001 and 2009.¹⁰ Since 2009, new enrolment is, however, decreasing at all HEIs in the region (Table 3). Partly this is due to smaller cohorts of young people entering university, but also a result of the recent funding incentives from the MEYS to reduce the number of students enrolled every year (See Chapter 5). The number of students in tertiary professional schools has also experienced a 16% growth in the region since 2007, but attracts only around 6% of tertiary education students compared to 7% in the Czech Republic.

10 The university funding system was promoting this increase in the number of enrolments (see « OECD Reviews of Tertiary Education - The Czech Republic », 2009)

Table 2. Number of students in HE, 2001-2012

Number of students	2001	2005	2009	2010	2011	2012	% of change since 2009
VSB - TUO	13 914	18 973	23 143	22 341	21 307	20 539	-11.3%
UO	5 498	8 092	9 688	10 218	10 384	10 409	7.4%
SUiO	3 367	4 712	8 902	8 810	8 430	7 884	-11.4%
BSO	482	2 093	3 430	2 976	2 090	1 194	-65.2%
CoSaAA	n.a.	n.a.	261	404	399	347	33.0%
Total	23 261	33 870	45 424	44 749	42 610	40 373	-11.1%

Source: Own universities and Ministry of Education, Youth and Sport.

Most of the students in Moravia-Silesia are studying in public HEIs (around 95%, above the figure for the whole Czech Republic of 88.5%). VSB-TUO has a prominent position in the Moravian-Silesian HE System with 51% of the students and new enrolments, and to lesser extent also in terms of graduates. Competition for students is more intense for bachelor programmes than for master or PhD programmes. Students in public universities tend to continue their higher education in Master degree programmes.

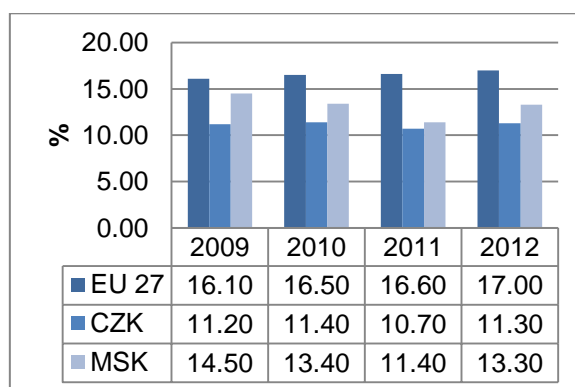
Table 3. New enrolments per HE, 2001-2012

Number of new enrolments	2001	2005	2009	2010	2011	2012	% of change since 2009
VSB - TUO	3 586	4 406	5 115	4 619	4 212	4 174	-18.4%
UO	1 337	2 125	2 142	2 357	2 405	2 099	-2.0%
SUiO	741	1 663	2 722	2 414	1 940	1 660	-39.0%
BSO	270	709	593	405	309	234	-60.5%
CoSaAA	n.a.	n.a.	114	128	106	62	-45.6%
Total	5 934	8 903	10 686	9 923	8 972	8 229	-23.0%

Source: Own universities and Ministry of Education, Youth and Sport.

In Moravia-Silesia, the share of population aged between 18-24 years not in employment, education or training (NEETs) is 13.3% is below the EU-27 average (17%) although above the national average of 11.3%. While this rate has tended to decrease since 2009, the trend was reversed in 2012 as a result of the greater difficulties young people are facing to enter the local labour market.

Figure 1. NEETS, 18 to 24 years, 2009-2012



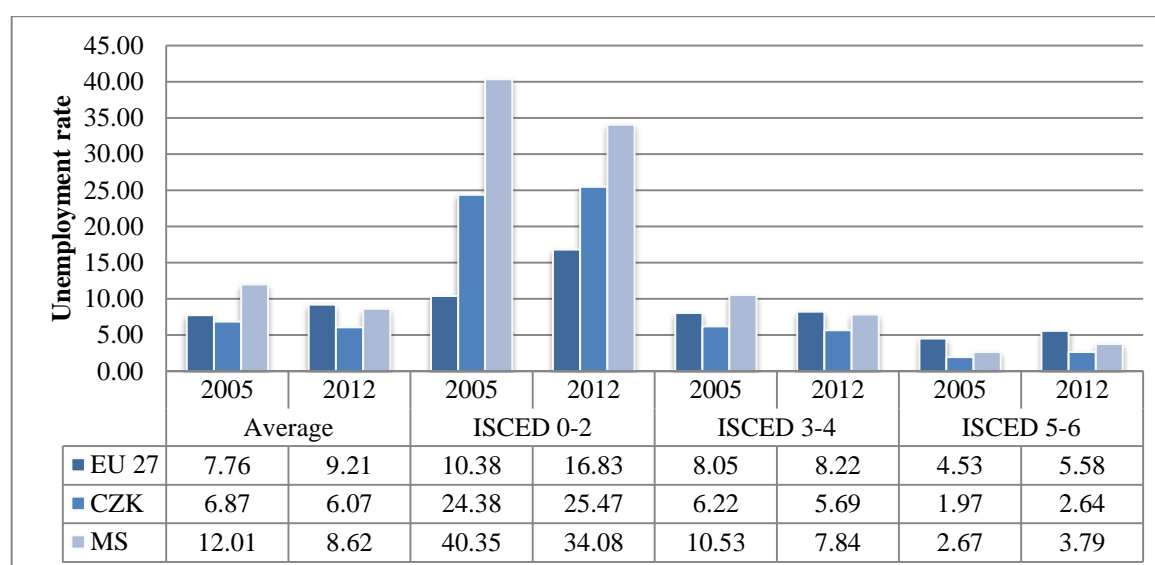
Source: Eurostat Regional Data.

Moravia-Silesia, and Ostrava city, in particular, concentrates a high proportion of Roma population resident in the Czech Republic (15.3% in 2007 according to the Roma Education Fund). Whereas little or no information is available on the actual size of the Roma population or their educational attainment levels, evidence suggests that only few Roma students make the leap into secondary studies, and even a smaller number reach higher education.¹¹

Signs of a mismatch between the supply and demand of high skills

Moravia-Silesia's unemployment rate in 2012 was 8.6%, above the average for the Czech Republic, but below European levels, with large differences according to education levels: the rate was only 3.8% for individuals with tertiary education (ISCED 5-6), which make up around 18% of the active population aged 25-64 years, but 34.1% for individuals with lower secondary education or less (ISCED 0-2), who account for around 6% of the active population of 25-64 years old. For population with ISCED-3-4 level education, who represents 76% of the population, the unemployment rate is 7.84%. On average and in spite of the economic crisis, unemployment has tended to decrease between 2005 and 2012. However, for the population with tertiary education the trend has been the opposite, with an increase in the unemployment rate from 2.67% to 3.79%. This suggests an increasing mismatch between skills supply and demand and Moravia-Silesia's difficulties to create jobs for the highly skilled.

Figure 2. Unemployment rate of 25-64 years old, by educational level, 2005-2012



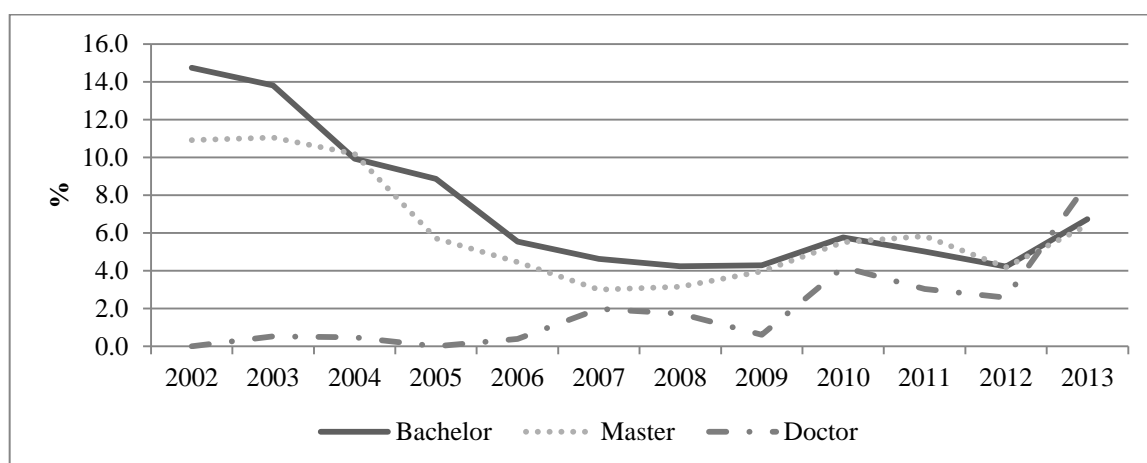
Note: Unemployment rate according to the Labour Force Survey; ISCED 1997 is used to classify educational levels. Source: Eurostat Regional Statistics.

Moreover, the last years of information show that unemployment rates for Bachelor-level graduates are at the same level or below graduates from master and doctoral programmes, which suggests a shift towards qualified but cheaper labour force amongst the regional employers (Figure 1). The focus groups with students at all five HEIs revealed confirming information in response to

11 The registered Roma population based in the self-reported ethnicity of the 2001 Census is of 11 716 inhabitants in all the Czech Republic. The estimations are that the real population is around 15 to 20 times the registered one. For more information see Roma Education Fund (2007), and Czech Government (2011).

questions about local employment opportunities. An alternative interpretation, also reflecting a mismatch between skill supply and demand would be that the supply of Bachelor programmes graduates to the market has gone down in recent years since a large proportion of them would continue studying. The perception is that employers undervalue Bachelor programmes, especially in technical studies. The reduction of the supply of Bachelors might have helped to reduce the unemployment rates for this group while the increase in the supply of Masters might have led to an increase in the unemployment rate. These results, however, also point towards the need for universities to strengthen their role not in graduate production but also in creating an economy that can absorb these graduates.

Figure 3. Unemployment rates by HE degree in Moravia-Silesia, 2002-2013

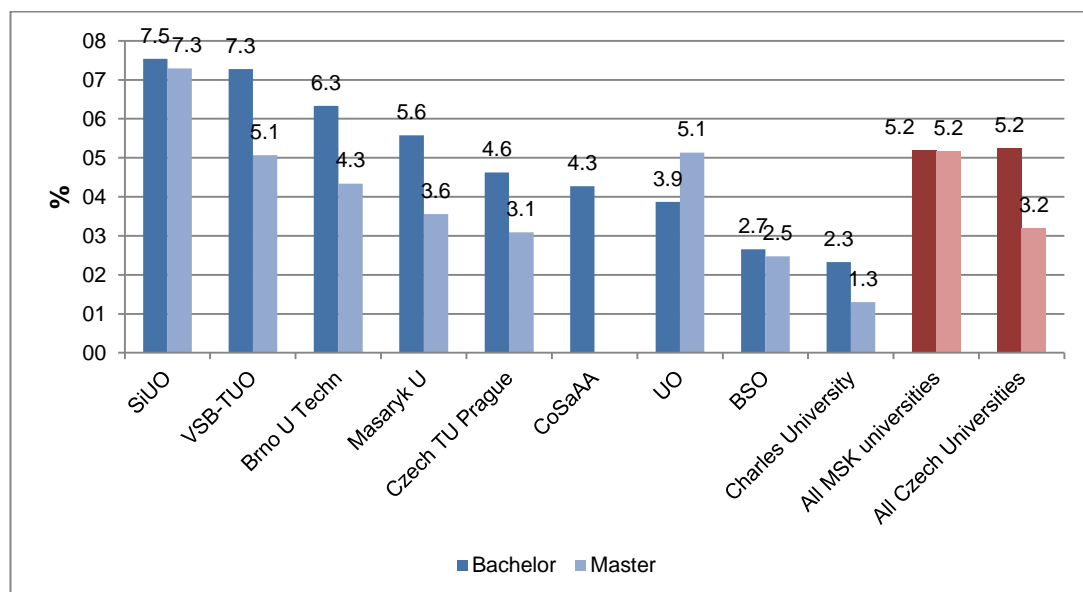


Note: Unemployment rate of university graduates is the ratio of unemployed graduates up to two years after graduation to the difference between the total number of graduates and the number of graduates that continues studying at the university (April survey).

Source: Ministry of Education, Youth and Sports.

The unemployment rate of Bachelor graduates in Moravia-Silesia is on average equal to the unemployment rate of Bachelor graduates for the country as a whole, 5.2% on average for the period 2009-2013 (Figure 2). Master graduates at the MSK universities face higher unemployment rates than the average Master graduate in the Czech Republic (5.2% versus 3.2% on average for the period 2009-2013). The Bachelor and Master graduates of the Silesian University in Opava and VSB-TUO have higher unemployment rates than the Czech average while this is the case only for Master graduates of the University of Ostrava. The higher unemployment for Master graduates is a persistent feature in the University of Ostrava. The two private universities show lower unemployment rates for both types of graduates although private universities' graduates tend to have lower unemployment rates than those from public universities' in the Czech Republic (3.5% for Bachelor graduates and 1.6% for Master graduates on average for Czech private universities during the period 2009-2013).

Figure 4. Unemployment rates for graduates selected Czech universities (averages for 2009-2013)



Note: Unemployment rate of university graduates is the ratio of unemployed graduates up to two years after graduation to the difference between the total number of graduates and the number of graduates that continues studying at the university. *Source:* Database for unemployment of graduates, published by the Center for Education Policy, University Charles V Prague.

There are also signs of a mismatch in the development of technical professional skills. The types of programmes offered by tertiary professional schools in the region do not seem to match the skill needs of the regional industry whereas the Bachelor degrees offered by HEIs do not meet the needs for more professional and experience-based skills. Whereas secondary level VET has a long tradition in the Czech Republic, tertiary professional schools were introduced in 1992 to develop a non-university vocational higher education sector (HVET). The HVET sector lacks tradition and does not have a good reputation amongst employers. This, and the fact that students have to pay tuition fees, makes HVET unattractive to both students and employers. Moreover, technically focused HVET programmes are expected to be provided by universities through Bachelor programmes. However, these type of programmes have not yet been developed, largely due to the accreditation system, which focuses more on research programmes. Under the present conditions it is therefore difficult for the universities to fulfil their expected role in the development of technical professional skills.

Employers are not sufficiently involved in the design and delivery of study programmes.

Aligning study programmes with the needs of regional employers has been reported as difficult. This is partly due to the national policy framework for higher education. In line with the Higher Education Act, Academic Senates have no external representation. While the private sector can be represented, for example via the Chamber, in the university Board of Trustees, the latter has only an advisory role (see Chapter 5). Despite this, all higher education institutions have undertaken steps to improve their engagement with external stakeholders. Efforts, however, differ between universities and also within the institutions. Faculties and departments have different emphases of their external links and their utilisation for curriculum development, delivery of study programmes and industry mobility of academic staff and students (Box 2.1.).

Box 1. Industrial relations of the HEIs in Moravia-Silesia

VSB-TUO engages closely with its industry partners. In addition to research collaboration, regional employers are represented in faculty scientific boards and other university governing bodies that discuss new initiatives with regard to curricula and work-based learning. Representatives of regional employers take part in final exams and are involved as lecturers in study programmes. For example, the Faculty of Mechanical Engineering established an Industrial Board where industry representatives and faculty meet to discuss and evaluate the content of study programmes and courses. VSB-TUO has also been active in developing new study programmes co-created with industrial experts within the framework of projects and has contributed to the development of business clusters. The current industry partners of VSB-TUO, which include also large companies, tend to emphasise the need for a constant flow of well-trained mechanical and electronic engineers, while they show less interest in their further specialisation.

Employer partners of **UO** are often from public sector. A key engagement activity of UO is the provision of further education and lifelong learning activities for teachers and health professionals. Industry and private sector collaboration is perceived as belonging more to the realm of technical universities and less suitable for HEIs that focus on humanities. However, new opportunities for industry engagement are likely to emerge from UO's research activities in biomedicine with the construction of the 4MEDi-Biotech Park for Medical Innovations in collaboration with PrimeCell, a private company, and other research institutions in the University Hospital Ostrava, which is part of the UO since 1992.

SUO several faculties are engaged in industry collaboration. The School of Business Administration sees essential value in private sector collaboration: one third of the members of the scientific board are business managers. Faculty members are involved in strategic boards of local business and in the design of regional public plans, company CEOs and managers visit the school regularly and the school has developed an online system for business partners to supervise and promote Bachelor and Master theses. The theoretically oriented Institute of Mathematics has two Bachelor programmes, both of which have close contacts with industry partners. Within the Faculty of Philosophy and Science, the degree of gastronomy, hotel management and tourism has close links with regional businesses for mobility schemes and work-based learning. The Faculty of Public Policy collaborates with hospitals and other parts of public administration.

BSO acts as an important gate-keeper for student-employer contacts in business and economics studies. It maintains links to key regional businesses, especially in the IT sector, and includes them as role models in teaching strategies.

For the **College of Social and Administrative Affairs**, the youngest and smallest HEI in the region, links with external stakeholders are focused on further training and life-long learning activities as well as consultancy projects for local governments. Local government officials are also involved as lecturers in teaching.

Despite these efforts, higher education in Moravia-Silesia is still largely supply-driven rather than demand-based. There is little evidence of co-constructed study programmes which address, in forward looking and visionary ways, development challenges and opportunities. Such programmes will have more success, in terms of student take-up and regional employer involvement, when they are interdisciplinary, that is, they admit students with different study interests and backgrounds. So far there has been a lack of focus on developing interdisciplinary study programmes, partly due to the current accreditation system which discourages experimentation in this direction (see Chapter 5).

There is no systemic approach to provide internship opportunities for students during or at the end of their studies¹². Within the HEIs, internships fall within the autonomy of faculties and rely largely on individual contacts of professors. Only a small proportion of students in a limited number of disciplines have access to work-based learning and internships. Furthermore, only little or no support is provided to the student to learn - in a more systematic way - from practical experience, which hampers the knowledge exchange between industry and the HEI. There are no provisions for students to dwell on their internship experiences within the study programme or course or to share their

¹² The Kompas pilot project tried to systemize placements but has not been accepted for implementation yet (Box 2.4)

experiences with other students. Also host organisations do not sufficiently consider internships as potential source of knowledge.

Most HEIs in the region have developed some type of career services to inform their students about work opportunities and improve their employability. In general these services are at early stages of development and often under-resourced considering the number of students and the labour market reality. An example is the Career Service VSB-TUO (Box 2.2) that has been recently established to provide services for more than 20 000 students. Despite the success of the annual career fair, the VSB-TUO Career Service has a narrow service portfolio due to the lack of investment in this important horizontal service¹³. While the small team makes efforts to reach out to a wide range of students, early on in their studies, most of the students who use their services tend to be in their final year of studies.

Box 2. VSB-TUO Career Service

In 2011, VSB-TUO established the **Career Service** to support employability of its 20 000 students. The Career Service reports directly to the Vice-Rector of Social Affairs and has so far been endowed with limited human resources considering the institution's large student population. There is one fulltime employee, whose responsibilities include also other university administrative tasks, and a part-time psychologist. More people assist during the annual Career Fair, including administrative staff from the university and student assistants for each firm. During the time of the OECD review visit in November 2013, the Career Service did not yet have a physical office within the campus. Funding for the Career Service operations is partially provided by the revenues of the Career Fair.

The service portfolio of the VSB-TUO Career Services is based on two main initiatives:

- The **employability support package**: (i) a personality test for students to self-assess their individual strengths and weaknesses and expert feedback from a psychologist, (ii) workshops on soft skills (communication, time management, stress management etc.), marketing, synchronisation of digital information, and (iii) CV preparation and the production of a video business card (1 min. duration). Results of the personality test can be included in the CV.
- The **Career Fair**. Each year this fair attracts hundreds of companies, and around 5 000 students. The annual fair was organised in different formats during the last 17 years and is also open to students and graduates from other HEIs. The event is run with a few staff and hundreds of student helpers who are matched with different companies. The event has built a robust reputation and is now so popular that little marketing efforts are needed to attract companies. The event is financially self-sustainable through participation fees. Each company pays between CZK 30 000-50 000 as participation fee for their stands. The surplus revenue is invested into staff costs and the employability support package activities of the Career Service.

HE alumni relations can be a powerful mechanism to increase industry involvement in higher education. Some of the HEIs in the region started to institutionalise their efforts to maintain alumni relations, for example through regular circulation of information about study and HEI activities. However, most of the alumni links remain at the faculty and individual professor level, and thus remain un- or underutilised potential for the HEI.

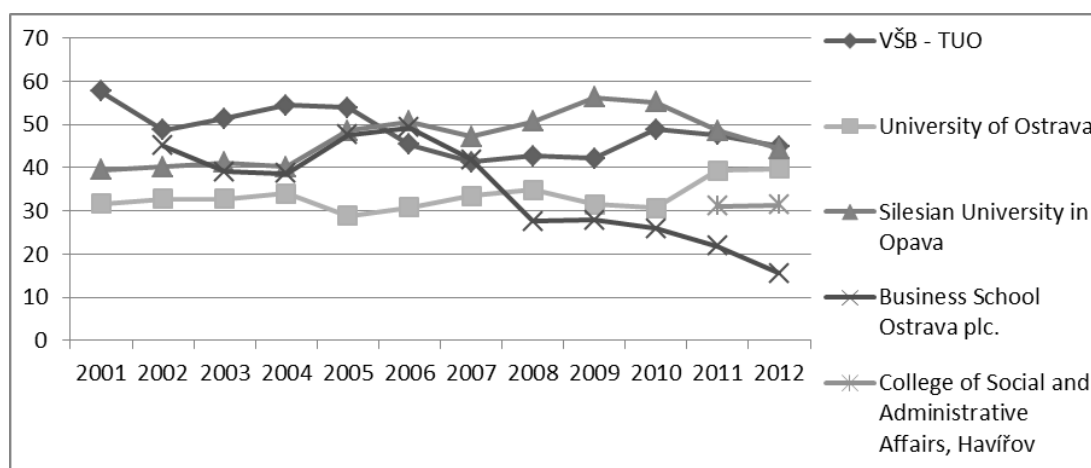
¹³ Chapter 6 on Governance describes in more detail the lack of incentives for universities to invest in horizontal services with the current funding system.

Inefficiencies in graduate production result in dropout and extended studies.

All public HEIs in Moravia-Silesia show a lack of efficiency in graduate production. Dropout rates are persistently high in HEIs, especially for first year students¹⁴. A large numbers of students also extend their studies beyond scheduled time. Due to a lack of sufficient student tracking, there is limited robust information at the regional HE system or institutional level about the actual dropout reasons of student-related characteristics. Evidence suggests that the dropout phenomenon is related to the student (original choice of study, change in choice of study, preparedness for study programme/subjects, preparedness for higher education in general), the higher education institution (offer of prior-to-enrolment support activities, provision of academic, social and financial support during the studies, particularly the first year), the higher education system (entrance conditions, entrance preparation, higher education funding) and the social security and tax system.

A partial explanation for the high dropout rates is that enrolment at public universities in the Czech Republic is free for students for the duration of the degree programme plus one year (after that study fees between EUR 3 500-5 000 depending on the degree occur). Many students, who are not admitted to their first choice of study or who discover that they do not like the study programme they have enrolled in, dropout from during the first year. Moreover, higher education students benefit from various social benefits, such as health insurance and transport subsidies. These benefits give incentives to enrol in a university even when there is no clear aim of pursuing the studies. Finally, differences between dropout rates between public and private institutions are partly due to the fact that funding of private institutions depends almost entirely upon study fees, which acts as a strong incentive to retain students. At the same time, studying in higher education brings with it several challenges for learners, for example, less structured courses, end-term exams instead of continuous feedback on study progress, and more distant student-teacher relationships. These might all be dropout reasons.

Figure 5. First-year Bachelor studies drop-out rates (% , 2001-2012)



Source: Own HEIs.

14 This is a pervasive feature of the Czech Republic as a whole. See « OECD Reviews of Tertiary Education- The Czech Republic », (2009) or the « Masaryk University Evaluation Report » (2012) of the Institutional Evaluation Programme of the European University Association (EUA).

A large proportion of the dropouts re-enrol in other, often private, HEIs. There is no data available at a regional level, but for the country as a whole, in 2011, the completion rate¹⁵ for Type 5.A programmes (bachelor and master level studies) was 75% and for Type 5.B programmes (tertiary professional programmes) 59%, while the OECD average was 70% and 61% respectively. There is no information about to what extent re-enrolment also implies a change of study programme.

The high dropout rates and the lack of robust information on causation make it difficult for government and HEI management to allocate resources. They have negative individual, regional and national effects as they postpone the students' entry to the labour market and can provoke scarring effects for learners. Government and HEI management will need to better understand the nature of the dropouts phenomenon, for example whether they affect particular disadvantaged groups, whether they are due to lack of competences and skills knowledge, lack of information about what to expect from a particular degree or problems of adaptation to university life.

In general for most HEIs in the region, measures to address the dropout phenomenon do not appear high on the agenda. Anti-dropout measures are generally left to individual faculties to handle with. There is a lack of long term measures (e.g., tutoring in small groups, student tutoring) and a focus on supplementary and often fee-based courses prior to enrolment in the most problematic subjects.

HEIs do not sufficiently track student progression and employment outcomes.

Concerns about student retention and employment outcomes highlight the need to develop student tracking systems. At the institutional level, a systematic tracking of students' progression (including overall student satisfaction) could help identify and correct the high drop-out rates and facilitate retention if effectively supported by early intervention measures. Currently, none of the HEIs in Moravia-Silesia have developed robust systems to monitor student progress.

Whilst HEIs in Moravia-Silesia express their concerns about the lack of regional employment opportunities for graduates, institution-wide information systems to monitor the labour market outcomes of graduates have not yet been developed. At the national level the Ministry of Education, Youth and Sport (MEYS) monitors graduate unemployment (after half a year, one year and two years of graduation) by HEI twice a year, in April and September, but there is no information about the degrees of graduation or about satisfaction with the skills acquired during the period of education. Collecting this type of information would be useful to facilitate the allocation of resources in order to improve employability in challenging areas and to attract and retain students, provided that this information is appropriately disseminated. Internationally, institution-level tracking of employment outcomes is often undertaken by university career services.

HE students do not have enough activities to develop soft skills.

One of the challenges that HEIs in Moravia-Silesia face is to ensure that students also gain important transferable soft skills during their university studies in order to facilitate job entry and progress. The KOMPAS pilot project interviewed 1 311 students of VSB-TUO and a sample of 250 firms found that students and graduates have reached good levels of theoretical knowledge but lack soft skills in communication, teamwork, and a good command of a foreign language, in particular English. This was also confirmed during the study visit.

¹⁵ Completion rates are defined as the percentage of individuals that start a type-X programme and finish with at least a degree in type-X programmes.

There are efforts underway in Moravia-Silesia to address the soft skills gap at earlier levels of education, notably the project “Competencies for life” (Box 2.3). At higher education level, however, soft skills do not seem to be systematically integrated into study programmes¹⁶.

Box 3. Competencies for Life project

The project “Competencies for Life”, undertaken by RPIC-ViP Ltd. (an educational and counselling firm) and disseminated in cooperation with the MS Pact for Employment, focused on teachers and learners in primary and secondary schools and proposed a methodological framework for the development of soft skills (communication, co-operation, entrepreneurship and problem solving) in early education.

Activities included:

- Development of training toolkits for six competencies: communication, cooperation, entrepreneurship, problem solving, life-long learning, exploring and orientation in information.
- Transfer of toolkits through the training of primary and secondary school teachers.
- Pilot testing and implementation in schools.

A first round of the project was successfully implemented in the Czech Republic and other countries between 2005 and 2010. The budget for the present round (2010-2013) was around EUR 680 000 financed from the European Social Fund and the Czech government.

Current initiatives to promote soft skills through the career services of the HEIs are good starting points but their radius of action – both in terms of student take-up and impact on learning outcomes – is too narrow. The VSB-TUO Career Service, for example, has insufficient resources with regard to the number of students.

HE studies do not sufficiently expose students to internationalisation

The internationalisation strategy of Ostrava and Moravia-Silesia region focuses, on the one hand, on the attraction of foreign investment to absorb the job-seeking low skilled population, and, on the other hand, to attract large scale research facilities to absorb highly skilled labour market entrants and job-seekers and to attract new talent from abroad.

All HEIs in the region acknowledge the need for their active role in internationalisation and have taken steps to build more strategic approaches. VSB-TUO is developing R&D partnerships and cooperative degree and exchange programmes in Europe, Japan and China. The University of Ostrava is building strategic education partnerships in Switzerland and Italy to attract fee-paying students. Its division in Lugarno (co-ordinated by the Institute for International Studies) started with a Bachelor programme on Health Care Specialisation/Physiotherapy in the academic year 2011/2012, taught in Italian language, in collaboration with the L.U.de.S., University of Human Sciences and Technology. There are plans to expand this collaboration and also to create a new off-shore campus in Italy.

These are promising initiatives, but large-scale initiatives are needed too, in order to increase the currently overall low level of foreign language skills amongst students and graduates. If not addressed, this can reduce attraction of foreign investment as well as the capacity of local firms to expand internationally.

16 For example the “Engineering and Computer Science” degree at the VSB-TUO includes as optional soft skills courses. In the academic course 2008-2010, 100 students followed the courses.

Despite the above mentioned promising strategic openings, HEIs in Moravia-Silesia have not yet developed overarching internationalisation strategies that comprise teaching, research and knowledge exchange. Current efforts are focused on mobility of students and staff (Table 2.1). While still at a relatively modest level (and with diversity across institutions), student exchange has shown positive developments (relative to their size) in most of the HEIs. At the same time, institutionalised academic co-operation remains low with international contacts fragmented and focused on individuals and not linked to an overarching institutional strategy. It is difficult for the HEIs in the region to balance outgoing and incoming mobility. The two biggest universities, VSB-TUO and UO, attract the largest numbers of international students, 481 and 300, respectively, although the share of international students is still low: 2.3% (VSB-TUO) and 2.9% (UO). In 2012, related to size, UO – despite competition from Prague – was the leading institution in student exchange in Moravia-Silesia; also in terms of absolute numbers of outgoing students. The share of the outgoing exchange students is high in SUO, University of Silesia in Opava, (2.7%, 216 students), however the university faces difficulties in attracting international students. The two private HEIs face even more challenges in internationalisation, with very low or no mobility of students.

Table 4. Mobility across universities: number of participants in exchange programmes

	Students		Academic Staff		Total number of students	Total Academic staff
	Outgoing	Incoming	Outgoing	Incoming		
VSB-TUO	331	481	273	131	20 539	1 078
UO	344	300	117	104	10 409	697
SUO	216	41	82	47	7 884	298
BSO	11	8	10	7	1 194	47
CoSaAA	0	0	0	0	347	22
	As % of the total number of students		As % of the total academic staff			
	Outgoing	Incoming	Outgoing	Incoming		
VSB-TUO	1.6%	2.3%	25.3%	12.2%		
UO	3.3%	2.9%	16.8%	14.9%		
SUO	2.7%	0.5%	27.5%	15.8%		
BSO	0.9%	0.7%	21.3%	14.9%		
CoSaAA	0.0%	0.0%	0.0%	0.0%		

Source: Own HEIs.

With increasing mobility flows, recognition of study results acquired outside of the home institution becomes a key priority for all HEIs in Moravia-Silesia. While the university staff emphasised flexibility in credit transfer, anecdotal evidence shows that many students have to spend an extra year catching up with their study work, which points towards incompatibility in curricula, and difficulties in credit recognition. Poor command of foreign languages is also a constraining factor for outgoing mobility besides lack of funding and in some institutions lack of adequate number of exchange opportunities. A lack of well profiled study programmes and courses in foreign languages and English speaking support services can act as constraints for international incoming students.

Staff mobility can bring many benefits to higher education institutions and individuals, through new competences, languages, teaching methods and international networks. Apart from CoSaAA, staff mobility in Moravia-Silesia's HEIs shows relatively high shares ranging from 16.8% (UO) to 27.5% (SUO) for outgoing staff, but much lower rates for incoming staff, from 12.2% for VSB-TUO to 15.8% for SUO.

As mobility is limited to a small percentage of student and staff population, Moravia-Silesia's HEIs will increasingly need to focus on "internationalisation at home". Integrating a global dimension into the design, content and delivery of study programmes and teaching/learning processes could ensure that the 80%-90% of students who do not take part in international mobility acquire internationally relevant skills. This highlights the need to attract foreign teaching staff and researchers and to integrate them into campus life, more focused language learning efforts, greater utilisation of digital learning opportunities and active participation in international disciplinary and multi-disciplinary networks.

In Moravia-Silesia, a good command of a foreign language seems to be perceived as the student's responsibility. Student-based associations such as AIESEC in the business schools across HEIs in the region and ESC in the VSB-TUO offer opportunities to practice English and other languages and to engage in on-campus internationalisation. Institutional efforts to support foreign language(s) acquisition are, however, still at early stages of development. Although HEIs offer degree programmes in foreign languages (e.g. the VSB-TUO has 72 degree programmes in English or German), these are fee-based for Czech students, discouraging participation. There are foreign languages courses, but only few activities focus on conversation skills. There are no dedicated language centres for independent learning or language courses. To remedy the limited offer of study opportunities in foreign languages – which is partly also due accreditation (see Chapter 5) – VSB-TUO leadership, for example, is promoting a practice that allows educators to teach in a foreign language if students in class demand this. This is a good initiative to raise awareness and interest amongst both students and staff to internationalise the curriculum.

HE collaboration, inter-disciplinarity and educational pathways are lacking.

The development challenges of the regional economy in Moravia-Silesia provide a wide range of opportunities for HEIs to collaborate with each other. However, to date, there are only few examples of such collaboration. Interdisciplinary programmes, also within the same HEI, are rare and difficult to organise, partly due to the accreditation system (see Chapter 5). Despite complementarity between study programmes of higher education institutions and opportunities for collaboration, there are only few examples of cross-HEI collaboration.

Box 4. Collaboration between VSB-TUO and UO

Although interdisciplinary courses across universities are difficult to organize, mainly due to administrative constraints, a few bottom-up collaborations exist in Moravia-Silesia.

- The Bachelor degree programme "Biomedical Technology" and the Master degree programme "Biomedical Engineering" are joint programmes between the VSB-TUO and the University of Ostrava's Faculty of Medicine and the University Hospital.
- VSB-TUO and the UO Faculty of Pedagogy collaborate in training secondary education teachers in technical fields.
- Bottom-up student cooperation between VSB-TUO and OU has led to the establishment of a joint student union.

Erasmus students are currently supported by VSB-TUO and OU individually, but there are plans to offer common services.

There are several examples of how HEIs link with earlier levels of education and other strategic local and regional actors. One example is the MS Pact for Employment, a platform for collaboration between different education institutions, public sector organisations and private sector actors; it has become a model for local economies elsewhere in the country and abroad.

Box 5. The MS Pact for Employment

The MS Pact for Employment, signed in 2011, is an example of successful collaboration of different education institutions, public sector organisations and private sector actors. The aim is to strategically address the regional labour market challenges, such as low participation rate, high unemployment rate and long-term unemployment. The MS Pact for Employment is a formal association of the Regional Authority, the Union for the Development of the Moravian-Silesian Region, the Chamber of Commerce and the Regional Cohesion Council.

The MS Pact has five key priorities - more and better job posts, technical and workmanship excellence, perfect services, entrepreneurship and creativity, and employment for everybody - and developed several initiatives to raise the competitiveness of the regional economy. Work to date has focused on feasibility studies to enhance collaboration in higher education, closer private sector links, and to align education provision with current and future labour market needs.

An interesting initiative is the KOMPAS pilot project for "Competencies and Placement", which was jointly developed with VSB-TUO. KOMPAS developed a framework to systematically organise internships and traineeships, which is ready for implementation.

Collaboration between HEIs and secondary schools is an area with several promising initiatives underway. Student recruitment is an issue for some of the HEIs in the regions. With possible exception of the University of Ostrava, which continues to attract a large number of applicants, most HEIs suffer from reduced numbers of applicants. There is a lack of interest in engineering and science studies amongst secondary school students: Law and social sciences are preferred study areas for 45.3% of all currently enrolled HE followed by technical studies with 40.8%. 5.7% are studying humanities, 4.3% health sciences (recently opened programmes), and 3.9% sciences. HEIs outside of Ostrava city face particular challenges as students prefer to study in bigger cities. In the case of private institutions which depend almost entirely upon tuition fees, a reduction in enrolment can seriously endanger institutional sustainability. For example CoSaAA has a weak financial situation due to low numbers of student enrolment (347 students) and a decrease in new enrolments of above 45% since 2009.

Box 6. VSB-TUO collaboration with schools

VSB-TUO is aware of the challenges in attracting new students into science and technology fields. Recruitment efforts, as often customary in Czech HEIs, are driven by faculties who individually reach out to schools. The faculties annually organise open days for prospective students between November and January. They also collaborate with primary and secondary schools to popularise science, technology, engineering and mathematics through different initiatives. Some faculties, e.g., Faculty of Civil Engineering, organises 1-2 day summer schools for primary and/or secondary students at the university premises and make learners with games, competitions and lectures familiar with what university life means. The "Nové Talenty" (New Talents) initiative, undertaken by VSB-TUO in partnership with the Technical University of Liberec, the Regional Development Agency, National Engineering Cluster o.s., and the IT Cluster systematically reaches out to primary and secondary schools. The project built two demonstration centres, one in Ostrava and one in Liberec, where elementary and secondary school students and university students get familiar with the research and development activities of VSB-TUO and Liberec University in an entertaining way. The project is co-financed by the European Social Fund and the Czech Republic.

Source : www.talenty-pro-vedu.cz.

Whereas increased efforts are underway to ensure greater collaboration between higher education and earlier stages of education, pathways or permeability between tertiary professional education and higher education are underdeveloped. A greater permeability would enhance, however, the relevance of higher education in life-long learning. Given its ageing population and out-migration, Moravia-Silesia cannot rely only on young people as the primary suppliers of skills. A wide spectrum of full- and part-time adult learning activities is needed. Skills upgrading, targeted training at mid-career and general enhancement of qualifications would improve the competences of the labour force in meeting the challenges of a globalised economy.

Involvement in lifelong learning activities varies across the HEIs in the region and there is room for improvement. The University of Ostrava is the most active in terms of lifelong learning. The focus is on compulsory retraining courses for certain types of professions (*e.g.*, teachers, health professionals), with 166 courses and 6 539 participants in 2012. It also offers a growing e-learning portfolio. VSB-TU offers 152 courses for 2 554 adult learners; the Silesian University of Opava has approximately 2 300 adult learners enrolled in 100 courses. The College of Social and Administrative Affairs has around 277 participants (10 courses), and the Business School 29 courses and 179 participants. No information was available to what extent the curricula of these courses are co-constructed with regional employers or tailored to their needs (See Annex).

Recommendations

Further investigate and respond to the emerging signs of a mismatch between the supply and demand of skills in the high skills sector. There are signs of an increasing mismatch between skills supply and demand in the high skills sector. This need to be investigated further by the HEIs in the regions, the key local development stakeholders (such as local and regional governments, Chamber of Commerce, MS Pact, Regional Development Agency), and the Ministry of Education. It will be important to engage closely with regional employers in order to meet the current demand and to co-develop a demand for skills, which meet the needs related to the economic restructuring and the transition towards a knowledge-based economy. This should include a skills and labour market observatory, which provides robust information on current and future demand and supply of skills.

Introduce HEI-level (institutional, faculty and degree) systems to monitor graduate employment outcomes. The HEIs should be encouraged and supported in monitoring the employment outcomes of their graduates. Robust information on the future skills needs is necessary in order to facilitate evidence-based strategic decision-making by the universities, the regional and central government but also by the students. In addition, monitoring student progression and graduate employment outcomes help to identify problems related to study and degree programmes and to address these. This could be done in co-operation with the Regional Employment Office, as it is the case in the Basque region of Spain (Box 2.7). All campus or faculty alumni associations should be used to get and keep in touch with graduates and regularly gather data through short online surveys but also through social activities.

Box 7. LANBIDE and the Basque Observatory for employment of graduates (ES)

The employment outcomes of tertiary education graduates are regularly monitored by the Basque Government. The Basque Employment Office (LANBIDE), in co-operation with the Basque universities, carries out surveys of university graduates (for different fields and faculties) three and a half years after their graduation. The surveys do not only relate unemployment but also employment access and characteristics (wages, if the position requires the degree obtained, if the position is or not in the Basque Country, etc.) and satisfaction with the university and with the education received (theoretical, practical, internships, etc.). The University of the Basque Country (public) has initiated this collaboration in 2002. In recent years the two private regional universities have also signed an agreement with LANBIDE. In last year survey, 81% of the graduates answer the questionnaire. In the case of VET graduates LANBIDE undertakes graduate surveys annually. The information

that is collected is published and disseminated amongst stakeholders. The implementation of this type of initiative does imply coordination between the universities and the employment office. LANBIDE and the universities in the Basque Country share the costs of regular surveys.

LANBIDE offers the following learning points for the HEIs in Moravia Silesia:

- Tracking of graduates from different degrees and faculties as a way to gain better understanding of the type of employment and job location (inside region, elsewhere in country, abroad)
- Identifying weak points in the study programmes, teaching strategies and learning environments
- Understanding the evolution of the regional high skills labour market and possible mismatches between the education offer and the labour market skills demand, with regard to the design of new labour market policies and measures

Source : www.lanbide.net

Systematically monitor student progress and develop early intervention measures to improve retention, reduce dropouts and support graduation. Develop a system which monitors student satisfaction and total student experience, including an assessment of services provided by the university and the quality of higher education, encompassing teaching and learning, curriculum, student life and mentoring. Dropout rates are persistently high in Moravian-Silesian HEIs, especially for the first year students. Despite different reasons for dropouts, the HEIs will have to intensify

- School collaboration
- Orientation, information and guidance to prospective students on learning programmes (e.g. using alumni or current students as ambassadors)
- Preparation efforts prior and during the first year to allow students to catch up in the basic subjects of the study programme (e.g. mathematics, physics). The current practice of consultation hours should be complemented with group activities in which students collaborate and are accompanied by tutors
- Provision of more efficient academic, social and financial support measures for students throughout their studies to enhance them in succeeding in their studies.

Students would benefit from courses on time and stress management and career counselling. Moravia-Silesia's HEIs – either individually or by forming strategic alliances – should consider developing programmes and support systems that are targeted at students who are academically weaker, come from lower socio-economic backgrounds or minority groups or who combine work and study. International initiatives that help continue to facilitate access, provide ladders-of-opportunity and provide support systems or mentoring to ensure all students can successfully progress through their programme of study include the DIT Access Service.

Box 8. Box 2. DIT Access Service

The Access & Civic Engagement Service of the Dublin Institute of Technology (DIT) was established in 1999 to assist individuals and communities in overcoming socio-economic barriers to accessing and graduating in higher education.

DIT Access Service aims to:

- Support students from disadvantaged schools in applying to higher education through a comprehensive programme of initiatives for schools and communities.
- Facilitate access to higher education for students from socio-economically disadvantaged backgrounds incorporating ethnic minority students through higher education access entry routes.
- Assist access students in adjusting successfully to DIT and gaining maximum benefit from their time in DIT by providing a range of post-entry supports.

The service provides a wide range of initiatives aimed at helping students integrate into the university environment. The aim is to help students improve their learning skills and realise their potential in relation to their course of study. The Study Skills Development Workshops aim to enhance the modules on study and examination skills, learning resources and career planning. Additional academic classes are provided for students who feel they might need extra help. The Peer Mentoring programme involves a “buddy”, who is an older student. A student in second, third or fourth year, he or she is able to help first years with information or any questions they have about college life. Suitably qualified older students may also provide tutoring support for other students, based upon their level of academic support required.

The initiative could be adapted to the particularities of Moravia-Silesia with respect to socio-economic background of students and minorities, improving access to and success in higher education.

The Access Service works with 29 secondary schools, 32 primary schools and through the Higher Education Access Route, a collaborative access entry route, indirectly with secondary schools nationwide. The Access Service has supported over 1,000 students from socio-economically disadvantaged backgrounds in accessing DIT and worked with over 10,000 students through its school and community initiatives. Access students have achieved considerable academic and other success during their time in DIT and upon graduation. Retention rates of access students are higher than retention rates amongst the general student body and increasing numbers of access students are achieving distinctions in final exams.

The success of the programme relies on collaboration between external partners, the DIT Access Service and services and colleges in DIT.

Source : www.dit.ie/ace/access/ Contact: Kieran Houlihan; Email: Kieran.Houlihan@dit.ie

Significantly increase the involvement of regional employers in the design and delivery of study programmes. Higher education in the region is more supply-driven than demand-based. There is limited involvement of regional employers which results in the lack of dovetailing study programmes to regional needs. This should be changed. This relationship can take many forms: participation of the private sector in curricula reform and lifelong learning strategies oriented to meet its needs; lecturing, using experiential and problem-based learning that enhance employability and entrepreneurship; using internships and mentoring to improve employability and entrepreneurship allowing the students to be in contact with prospective employers and successful entrepreneurs. Dovetailing study programmes may also entail a greater inter-disciplinarity of programmes and collaboration amongst HEIs. The current situation is, however, not conducive to such study programmes. Despite the current challenges around the accreditation of new study programmes, HEIs in Moravia-Silesia should be encouraged to collaborate with each other in the design and delivery of new study programmes.

Box 9. World of Work at Liverpool John Moores University (UK)

World of Work at Liverpool John Moores University is a programme that is co-designed and co-delivered with employers to enhance the employability of students and that is integrated into every degree course offered at the university. It is a labour market matching model designed, developed and delivered in collaboration with employer partners. WOW has a national advisory group consisting of organisations such as Oracle, Sony Europe, CBI, Airbus, and Marks & Spencer amongst others.

The initiative aims to ensure that every student is equipped with the skills they need to successfully engage in the world of work, either because they possess skills which are highly valued by employers or because they are well equipped to set themselves up in their own business. The programme identified the skills most valued by employers covering Self Awareness, Organisational Awareness and Making Things Happen. It also identified eight graduate transferable skills as being essential for employment: analysing and problem solving, team working and interpersonal skills, verbal communication, written communication, personal planning and organising, initiative, numerical reasoning, information literacy and IT skills. All students are encouraged to develop these key skills within their subject and also at the purpose-built Graduate Development Centre.

There are three inter-related elements:

1. Work related learning: Every student is offered work related learning as part of their course, including opportunities to undertake a 1 year paid placement, as well as shorter placements and day long "World of Work Uncovered" visits to employer facilities;
2. Graduate skills: Development of soft-skills as a part of degree, with academic modules integrating simulations of workplace situations and curriculum input from employers and careers advisors. Students can receive a 'graduate skills transcript' upon graduation; and
3. World of Work Skills Certificate (supported by Sony, Oracle, Shell, etc.): After completing a process involving an online virtual interview, attending careers workshops, writing 3 skills statements and finally a filmed interview with an employer verifier, students can be awarded a World of Work Skills Certificate, alongside their degree

This type of programme is relevant for Moravia-Silesia because of its engagement with local employers and the acquisition of soft skill might enhance the employability of graduates and their retention in the area. For the universities similar initiatives would improve their regional relevance, would improve the service that they already offer to their students and would act as an attractive element to prospective students, from the region and from abroad, which is especially important when the number of new enrolments is going down.

The World of Work Careers Centre at Liverpool John Moores University won the Association of Graduate Careers Advisory Services Technology Award in 2013 for successfully embedding their World of Work Certificate into every undergraduate degree. Several pilot projects replicating the experience have been launched internationally (Malaysia, USA). Over 5 000 students registered with the WoW certificate across all disciplines, and 150 employers act as verifiers. According to recent data, 92.9% of the 2012 graduates were working or further studying six months after graduation.

The success of the initiative resides on the diversity of employers that have been involved, in terms of sectors and sizes. Extremely important is also the commitment, strategic and of resources, and the acceptance across the university.

Source : <http://www.ljmu.ac.uk/worldofwork/> Contact: Steve Burbage-Careers Adviser; s.burbage@ljmu.ac.uk

Enhance the attainment of soft skills as an integral part of study programmes. Students need soft skills in order to ensure their lifelong employability and to build entrepreneurial competencies. Creative problem solving and the ability to ideate are important in higher education in order to prepare the students for a meaningful working life: creativity and ideation are valuable for both job takers and job makers and those who are launching a start-up. While advanced and specialised (technical) skills are an asset in developing certain start-ups, the ability to communicate and sell the idea/product, perform in a team, act upon gut-feelings, have social skills, handle creative problem solving, engage in strategic thinking etc. are relevant and useful for all start-ups. In collaboration with VSB-TUO the methodology has been employed to the "Engineering and Computer Science" degree. A further expansion of this initiative into other study programmes would be recommendable. Here, also the "Competencies for Life" work of the MS Pact for Employment should be up-scaled and similar projects should be taken up by all HEIs. HEIs in Moravia-Silesia could find inspiration in the Mendeberri learning model which was developed for the engineering studies in Mondragon University

but has consequently been rolled out throughout the entire institution. Similar teams could be implemented in Moravia-Silesia across faculty boundaries or across institutions.

Box 10. Box 4. Mendeberri at Mondragon University (ES)

Mondragon University (Gipuzkoa, Spain) is a Basque university traditionally specialised in technical/engineering education and business, which has expanded its offer to other Social Sciences as well as Education and Communication, and more recently to Food Science. MU began to develop its own pedagogical model, Mendeberri (New Century), in 1999 in order to develop values and attitudes in the students that allow them to successfully integrate in the world of work and become active agents in the progressive transformation of society. The Mendeberri project was originally launched as a response to the feedback from the labour market. While companies were satisfied with the technical knowledge of the engineering students, they were critical of their soft skills. Mendeberri is a competence-based model that in addition to the technical skills focuses in transversal skills, such as team work, effective communication, problem solving, leadership, decision making, global vision and learning to learn. MU adopted a programme to gradually change the pedagogy to Problem Based Learning so as to develop such skills through the teaching process. In addition MU promotes the work-study training which is integrated into the degree programme; 17.7% of the bachelors and 32.4% of the master students follow this formula. All MU degree programmes include a compulsory final year project at a firm.

The teaching model is based on the following features: competence-based training, student-teacher relationship, continuous assessment, study-work combination, practical training in companies, innovation and learning, international experience, employability and job integration, and specialisation and development of doctoral studies. The Mendeberri model implies a change and diversification in the contents of learning as well as in the roles and functions of teachers and tutors who coach and guide the students. Instead of teacher-centred transmission of knowledge, learning takes place in small groups which receive coaching by a tutor and carry out co-operative work while students as team members are responsible for their studies. Students work in different teams throughout their studies and develop communication and social skills. Even teaching spaces, which used to be predominantly lecture halls, have been changed and set up as discussion arenas where students routinely engage in group projects. An important aspect for success is the continuous evaluation of competences and constant feedback. The Mendeberri model emphasises participation, engagement and co-operation; innovation and entrepreneurship; and a sense of responsibility and social transformation. Mendeberri has been progressively developed and integrated into all university programmes that now incorporate the key elements advocated by the Bologna Process.

The educational model is of clear interest for Moravia-Silesia since it addresses some of the challenges that its universities face, in particular the lack of soft skills that their graduates experience, but also the employability of their graduates and the involvement of regional employers. In addition, the Spanish system of accreditation of degrees shares some common features with the Czech one, so HEIs in Moravia-Silesia could learn from Mondragon University how to overcome possible institutional barriers.

The result has been a high-quality training aligned with the needs of companies and institutions, which ensures high employability and a high level of satisfaction amongst the students and teaching staff. The degree success rate is of 91.2% and the average time for Mondragon University graduates to find a job is less than three months. Students' satisfaction with their degrees scores 7.8 points out of 10 in Mondragon University.

As the model implies a complete change in roles (for students and for professors), it requires acceptance from the parts involved, especially from the faculty. A progressive implementation, starting with a selected degree or department would be advisable.

Source : <http://www.mondragon.edu/en/studies/learning-model/what-is-mendeberri>; Contact: Jon Altuna, Academic Vice-Rector at Mondragon Unibertsitatea, jaltuna@mondragon.edu

Expand and institutionalise links to alumni and utilise the alumni systematically in university marketing, fundraising and to strengthen labour market connections. Some of the HEIs in the region have started to increase their alumni links. This should be continued and expanded with the aim to make these links available for the HEI as such, that is, beyond the professor or researcher who have

alumni links. For this to happen, regular meetings, conferences, as well as tailored workshops and further training options should be offered. The regular circulation of information, as currently in place, is a good starting point, but concrete and relevant activities are needed for alumni to engage with their alma mater. Alumni can help deliver the message to potential students that study in the institution leads to great jobs. Stronger alumni connections can be facilitated in multiple ways, such as regular surveys of the alumni, inviting successful alumni as guest speakers to university events, inviting alumni members to speak to the students, and matching alumni members as mentors to students. The Technical University of Munich has an intensive alumni activity programme with a wide range of social events, research collaboration and life-long learning activities for its former graduates (<http://www.alumni.tum.de/en/homepage>).

Design and implement a systemic approach to provide internship and other work-based learning opportunities for students during and at the end of their studies. Currently only a small proportion of students in a limited number of disciplines have access to work-based learning and internships. In order to broaden the share of student population that have access to work-based learning internships need to be supported by the HEIs in terms of (i) spreading information, since hosting organisations prefer to have single interlocutors which provide them access to several candidates and routine procedures, (ii) facilitating the supervision of interns, especially if related to academic requirements and co-tutorship arrangements, (iii) providing assistance to the intern during the internship, (iv) making sure that experience reports are prepared and used to inform other students and teachers. Host organisations, in particular small and medium-sized firms, will welcome greater accompanying support as this is also likely to increase the absorption and exchange of knowledge. Students' work-based learning opportunities could be increased through a targeted campaign to encourage the regional clusters and companies to take up more university interns. Projects such as KOMPAS open a promising avenue that could be extended to the whole system. A systematic model of internships for students in regional firms can boost both employability and entrepreneurial spirit making education more relevant for regional development. The annual Job Fair in the region, organised by VSB-TUO, could be used to present good practice examples in the organisation of internships in order to promote higher take-up by regional firms. Another welcome measure should be to incentivise and reward the organisation of internships at the faculty and department levels. On the long run, internships and work-based learning opportunities should be compulsory elements in curricula. HEIs in Moravia-Silesia could find inspiration in the Aalborg University (DK) where most undergraduate and graduate programmes include a mandatory full semester for internships and the matchmaking between students and firms is facilitated by a dedicated department called the "AAU Matchmaking".¹⁷ Beuth Hochschule in Berlin has developed a structured approach to internship called Excellence Tandems.

Box 11. Excellence Tandems at the Beuth Hochschule in Berlin (DE)

The project Excellence Tandems at the Beuth University – started in 2007 - supports the formation of tandems of innovative technology-based regional companies and very good student. Excellent Diploma, Master and Bachelor students in the elaboration of their programme thesis or doctoral candidates work in close cooperation with selected partner companies. The student cooperates in a practice-related research project with a company, usually a small or medium sized enterprise, and is jointly supervised by a professor and a practice supervisor at the company. The project is funded by Berlin Senate Department for Economics, Technology, and Women's Issues, supported by the European Social Fund (ESF).

¹⁷ For more details see Aalborg University's matchmaking service website at www.en.match.aau.dk/Collaboration+with+students/Student+internship/

Excellence Tandems at master level study programmes include:

- **Kick-off talks** in the company to get the support of all protagonists and the management.
- **Expert talks** in the company with professors, tandem participants and external collaborators, i.e. with other professors to gather also demand-orientated suggestions for the focus of the Excellence Tandem.
- **Accompanying study programme** in form of tandem seminars regarding themes as public research funding and third-party funds sourcing, academic writing, project management and presentation skills.
- **“Excellence Tandem in practice”** event for all tandem projects to network and exchange. This serves the tandem participants as a forum to present intermediate results to an interested public of university and industry.
- **Transfer of practical knowledge report:** A common work sample is prepared jointly by the students and the supervisor in the host organisation, either in form of a report or a prototype. This is part of the final exam, and remains with the host organisation.

The universities in Moravia-Silesia could use a similar approach to enhance work-based learning and to intensify the relationship between universities and local employers, improving the employability of their students at the same time.

Source : http://www.beuth-hochschule.de/fileadmin/oe/tt/ExzellenzTandem/ExzellenzTandem_2010_SoSe/tt_et_10sose_bericht.pdf
Contact: Harald Joneleit, joneleit@beuth-hochschule.de

Develop comprehensive internationalisation strategies and policies, by developing of structures, mechanisms and incentives, and internationalising study programme curricula and RDI efforts. Strengthen foreign language skills amongst students and HE staff and increase the study offer in foreign languages. Key steps to this direction include: stepping up student and faculty mobility, integrating international dimension into all degree programmes and campus experience for the benefit of all students. This can be facilitated by attracting foreign teaching and research staff, taking advantage of massive open online courses (MOOCS), participating actively in (multi)disciplinary international networks and establishing on-campus language learning centres with a wide offer of language learning facilities for individual and group learning which help to move away from the current grammar-based education to international communication skills. Universities should develop courses at masters and PhD levels delivered entirely in foreign languages (books, instructions, exams etc.) and actively establish double degrees with partner institutions. A simple action would be to launch an annual award for achievements in internationalisation to a student or faculty member, while robust incentives for staff should be embedded in the institutional strategy. Some institutions such as the Silesian University of Opava and the Ostrava Business School would need to take active measures to introduce degree programmes in English and (financially) support international exchange students to provide courses in conversational English. Given the fact that the Higher Education Act allows to charge tuition fees of Czech students who enrol in degree programmes which are delivered in a foreign language and that this funding stream is important for many universities, HEIs could require compulsory attendance to several courses in English for each degree or by reducing tuition fees (that are not settled by law). A larger offer of courses in English might in turn increase the attractiveness of the universities in the region for foreign professors/researchers and improve its internationalisation. The University of Warsaw system of language provisions, centrepiece of its internationalisation strategy, can be used as a model for improving languages competencies.

Box 12. Motivating language learning: University of Warsaw System of Language Provision (PL)

The University of Warsaw System of Language Provision (USLP) initiative was launched in 2001 to reform the university language provision. USLP has multiple goals. It aims: (i) to ensure that all first cycle students have equal access to the broadest possible offering of language courses, (ii) to rationalise the University spending on language provision, and (iii) to ensure the conditions of transparency, openness and comparability of criteria and learning outcomes by reference to the standards of the Council of Europe “Common European Framework of Reference; learning, teaching, assessment”.

To ensure the broadest choice of language courses a consortium of providers from the university units was created: it involved the Faculties of Applied Linguistics, Modern languages, Polish Studies, Oriental Studies, the Language Centre, the Centre for Foreign language Teacher Training and European Education. In order to ensure smooth implementation of the reform and coordination of the whole system a Rector's Deputy for Language provision was nominated at the central level, and faculty co-ordinators at the respective units' level. The USLP is continuously developed, as the system requires permanent quality assurance and improvement measures. It requires sizeable funding depending on the number of students enrolled to language courses.

The key technical goal of the USLP is that each first-cycle student is able to demonstrate a B2 language proficiency level in at least one language on completion of studies. If the student is able to demonstrate this level on entrance to the University, he/she is encouraged to learn another language and take a certification examination, taking advantage of the offering of free of charge, credited courses. The requirement of B2 upon completion of first-cycle studies was reinforced in 2007 in the Regulation of the Minister of Research and Higher Education on standards of teaching.

The system of language provision at the University of Warsaw comprises the following elements:

- Central on-line registration for classes and examinations
- On-line diagnostic testing coupled with the registration system
- Framework programmes of teaching based on CEFR
- Conventional and on-line courses in about 50 languages (levels A1 – C2) (both general and for academic and special purposes)
- University language Certificate
- Centrally administered language certification examinations by University Certification Board independent of the language offering providers

The USLP offers language courses to all first-cycle students within the so called token registration, i.e. 240 hours of tuition, free of charge. Additional courses can be purchased (also by the students of the second-cycle and third cycle at competitive rates). Depending on the degree programme students take part in compulsory language courses, ranging from 120 to 240 hours during the first cycle, but can freely choose the language.

As in Warsaw, HEIs in Moravia-Silesia might use initiatives of this type as part of their internationalisation strategy, boosting mobility and employability of students within the European Higher Education Area.

USLP was awarded European Language Label for the most innovative language project in Poland in 2006 and was distinguished by the European Commission in the ELL competition in 2012. In the course 2011/2012, 13 700 students learn languages: 51% English, 25% French, German and Russian, and 12% Spanish and Italian. Around 8 500 students took certification examinations; of them 7 043 in English (6 056 B2).

A key element for success of the initiative has been the high degree of cooperation and coordination, making good use of all resources inside the universities (all faculties related to languages or providing courses in foreign languages). The initiative might require a sizable funding, depending on the number of students attending

the courses. In Warsaw, 2nd and 3rd cycle students can access the service paying a fee.

Source : <http://molan.info/case-studies/motivating-language-learners-through-language-policy/university-of-warsaw>;
http://ec.europa.eu/education/language/label/label_public/index.cfm?fuseaction=project_award&award_id=5162.
Contact: Marta Kicińska-Habior, Vice-Rector for students and quality of education, prorektorstud@adm.uw.edu.pl

Enhance HEI collaboration, interdisciplinary study programmes and permeability between tertiary professional education and higher education. There are opportunities for collaboration but there are too few examples where this is currently in place. The current efforts to design a regional innovation/smart specialisation strategy could be a good framework to increase collaboration around the opportunities and challenges faced by the regional economy (e.g. motivated students, who would like to remain in the region and pressures on the environment). Also the collaboration initiatives, started by MS Pact for Employment, could be expanded. Tertiary professional schools and HEIs are currently not connected. A greater permeability between the two systems would, however, enhance the importance of higher education for societal prosperity and well-being through new areas of business activity and job creation in areas addressing environmental challenges, demographic change, and the needs of a knowledge-based service economy. Currently cooperation between universities and tertiary professional schools is possible but in practice universities perceive that joint study programmes and/or high permeability of students and programmes would devalue university education, given the less strict legal framework that applies to tertiary professional schools. The MSK universities could find inspiration in some joint programmes developed between HVET institutions and universities, as the joint programme “Innovation Engineering in Processes and Products” recently inaugurated by the University of the Basque Country and the Machine Tool Institute that builds on the co-operative training system and is aligned with the requirements of the Spanish university degree system. This programme combines academic training with company-based work experience and represents an innovative demand-led study option which is directly related to company needs. The students sign a part-time contract and receive a salary according to the corresponding work agreement¹⁸.

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CHAPTER 2

RESEARCH, DEVELOPMENT AND INNOVATION

Patrick Dubarle

This chapter examines the current framework for research, development and innovation in the region with regard to the role of higher education institutions. It provides specific recommendations to improve regional innovation in Moravia-Silesia and illustrates these with good practices from other regions.

Introduction

During the last decade Moravia-Silesia's economy was exposed to severe competition from emerging economies. In response to this the former focus on mining and metallurgy was shifted and led to the emergence of clusters and value chains in several other sectors. This helped to establish niche technologies in a number of industries such as engineering, wood, automotive, IT, safety technologies, cleantech (Envicrack), and hydrogen technologies.

A main challenge for the future is to achieve a greater involvement of universities in the regional innovation system. Their potential strengths – related to research, skilled labour, international networks – have not yet been fully utilised. The universities in the region, particularly VSB-TUO, hold significant industry-relevant research assets and their R&D infrastructures recently received significant investment. These assets have, however, not been united into a coherent and dynamic system, which would require beside university-business also the presence of growing university-university links. Research focus and activities in universities are not considered as signposts for future development directions at business and industry levels, but happen widely apart and in isolation from the regional innovation system.

This chapter examines the reasons for this and offers suggestions on how key strategic issues and gaps can be addressed.

Findings

Framework conditions for research, development and innovation are mixed.

Framework conditions for research, development and innovation (RDI) are mixed in Moravia-Silesia. On the one side, the Czech innovation policy climate has been strongly supportive - 40% of public funding destined to R&D goes to public HEIs and research centres in the country. This has brought positive impacts also to Moravia-Silesia and its HEIs. Furthermore, the region is amongst the few Czech regions where since the mid-2000 an articulated cluster policy has been implemented. These clusters cover a number of industries such as engineering, wood, automotive, IT, safety technologies, cleantech (Envicrack), and hydrogen technologies. Activities focus not only on technology transfer and innovation but also on human resource development. Besides these advantageous aspects, the region, however, suffers from its legacy in heavy industry (job profiles of the labour force, environmental impacts, etc.) and outward migration, especially of the young and highly skilled. This renders the much needed specialisation and diversification of the regional economy difficult to achieve.

The public HEIs in Moravia-Silesia have obtained a robust position in a number of technology niches. VSB – Technical University of Ostrava (VSB-TUO), the larger and older of the three public universities, is particularly strong in supercomputer modelling, system engineering, nanotechnologies and mechatronics. The University of Ostrava (UO) has developed excellence¹⁹ in fuzzy mathematics and bioengineering. The Silesian University of Opava (SUO) has strengths in computer science, humanities and some areas of pure mathematics (See Introduction for a brief description of these universities).

Box 13. Uneven but diversified R&D potentials of HEIs in Moravia-Silesia

The **Technical University of Ostrava** (VSB-TUO) is specialised in technological sciences (civil, mechanical and electrical engineering and mining and materials). Currently, there are seven research centres: Nanotechnology Centre, Energy Research Centre, IT4Innovations, Centre for Advanced and Innovative Technologies, ENET, Centre for Environmental Technologies, and Department of Mathematics and Descriptive Geometry. R&D at VSB-TUO is organised around six poles of excellence: energy and environmental sciences, computing, new materials, modern engineering, safety technologies and economic modelling. National public funds devoted to VSB-TUO have more than doubled between 2005 and 2012 and the proportion of funds obtained in R&D has increased from 16.1% to 29.5% over the same period of time. The major part of VSB-TUO's research budget comes from EU operational programmes (about 45 million euros) and is largely invested in R&D infrastructure. These funds have helped the university to diversify its research portfolio and to encompass new domains such as nanotechnology, new energy and environmental technologies. As a result the Faculty of Metallurgy and the Faculty of Electrical Engineering are now less dominant in research than before (respectively accounting for 20% and 12.5% of R&D funds in 2012 against 30% and 17% in 2005). VSB-TUO has many links with businesses: only in 2012 530 agreements were signed. A number of outreach units have been established (Centre of Innovation Support, Entrepreneurial Incubator and Centre for Technology Transfer).

The **University of Ostrava** (UO) significantly increased its R&D personnel in the period 2002 to 2012 (+53%). The research budget (EUR 3.41 million, excluding EU funding) now represents 1.5% of the total research output of Czech public universities. Social sciences, biophysics, biochemistry, differential geometry, environment, chemical physics and computing are amongst the main areas of research UO's Institute for Research and Application of Fuzzy Modelling (IRAFM) develops specialist new mathematical methods. IRAFM is also part of the IT4Innovations project with the national supercomputer centre in the VSB-TUO. The European Research Institute for Social Work supports the professional growth of young researchers in order to develop knowledge and skills amongst social work managers and practitioners across Europe. Research contracts with industry are only a marginal part of UO's R&D activity.

The **Silesian University of Opava** (SUO) conducts research activities in mathematics, physics, computer science linguistic and history. The SUO cooperates with the University of Brno (particularly in mathematics) and with the Science and Technology Park in Ostrava.

The two private HEIs – the **Business School of Ostrava** and the **College of Social and Administrative Affairs** – conduct applied social research in collaboration with public organisations (such as local governments and hospitals) but also private firms. They, however, do not classify as formal research organisations.

Source : Kolar and Komensky (2013)

The region has a smart specialisation (RIS3) strategy. The main objective is to improve the competitiveness of the regional economy in global markets, setting as horizontal priorities technology transfer, human resources and internationalisation. As vertical priorities (research specialisation areas) five major sectors were identified: engineering and metallurgy (e.g., modern materials), energy (e.g., energy savings, co-generation), automotive (e.g., modular electric drives, low-cost automation),

¹⁹ Key university representatives refer to these as “areas of positive deviation”.

biotechnology (*e.g.*, regenerative medicine), and IT and electrical engineering (*e.g.*, mobile technologies, measuring and testing systems, and smart grids). VSB-TUO and UO have taken part in the RIS3 strategy elaboration process.

Despite the presence of niche technologies, the region ranks relatively low in the 2014 European Regional Innovation Scoreboard²⁰ in terms of its RDI performance, belonging to the moderate performers within the group of low innovation regions, i.e. between the ranks 126 to 132 amongst 190 selected EU regions. Also international research rankings, such as Scimago, indicate a relatively modest R&D performance for the public universities in Moravia-Silesia in comparison with other universities in the country and neighbouring Poland (Table 5). At the same time, the Scimago ranking shows that Moravian-Silesian HEIs are active in international collaborations and have a relatively good citation performance.

Table 5. Moravian-Silesian HEIs in the Scimago ranking (2012)

Rank	Universities	Output	IC	Q1	NI	Spec	Exc	Leadership
148	Charles University	16 743	37.1	38.2	1.0	0.6	9.2	9 547
703	Czech TU in Prague	4 739	35.7	27.9	1.1	0.8	11.0	2 988
704	Masaryck University of Brno	4 738	31.9	34.5	0.8	0.6	8.3	2 664
1032	Brno University of Technology	3 072	18.2	15.9	0.9	0.7	8.2	2 358
1075	University of Silesia (Poland)	2 966	30.9	37.5	0.8	0.8	5.3	2 038
1868	VSB-TUO of Ostrava	1 393	26.0	16.6	0.7	0.8	7.0	1 037
2384	Czestochova U of Technology. (Poland)	954	20.0	23.7	0.5	0.9	3.9	761
3239	University of Ostrava	406	35.5	27.8	0.9	0.9	13.4	247

Note: **Output** is the total number of documents published in scholarly journals indexed in Scopus. **IC** (International collaboration) is the institution's output ratio produced in collaboration with foreign institutions. **Q1** (high quality publication) is the ratio of publication that an institution published in so-called high-impact factor journals. For **NI** i.e. normalised impact, the value shows the relationship between an institution average scientific impact and the world average. A NI score of 0.8 means that the institution is cited 20 % below world average. **Spec** (specialisation index) indicates the extent of thematic concentration/dispersion of an institution's scientific output (1 for the most concentrated, 0 for the most dispersed). **Exc** is a metric for the high quality output of the institution; it measures the amount in% of an institution' scientific output that is included in the set of the 10 % of the most cited papers. **Leadership** indicates an institution's output as the main contributor through the number of papers in which corresponding authors belong to the institution.

Source: Scimago International Rankings (2012), SIR World Report 2012: Global Ranking, www.scimagoir.com/pdf/sir_2012_world_report.pdf

While most of the HEIs in Moravia-Silesia have now embarked on internationalisation strategies and achieved progress with this, efforts mostly focus on outward mobility (see Chapter 1). Funding from international sources, though increasing, is still marginal (about 4% of total national public funding in 2012 against 1% in 2003). The Scimago measurements also shows considerable gaps in international collaboration in research compared to the universities Prague in the ranking.

A promising initiative with regard to internationalisation is PROGRESS 3, which was started with the objective to create and enhance links amongst the universities of the Moravian-Silesian region, the Žilina Region and the Silesian and Opole Voivodships in Poland with regard to scientific research and innovation. The ambitious cross-border projects will, however, only be implemented if all HEIs fully engage in this. This would require determination and initiatives on the side of participating HEIs, for which, however, insufficient funding is available.

²⁰ The Regional Innovation Scoreboard implements a cluster analysis to identify regions which have similar innovation systems. The method looks for similarities in absolute performances or regions that display similar strengths and weaknesses in innovation. The Regional Innovation Scoreboard identifies four performance groups: leaders, followers, moderate and modest. Three further subgroups are defined for each group: high, medium and low.

2. Students and graduates can be a primary of innovation in the organisations that they join by bringing in new perspectives, knowledge and know-how. Currently, higher education students account for approximately 10% of the population of Ostrava city and for 3.5% of the population in the region. Hence, the potential for innovative employees and new entrepreneurs is there but it needs to be acted upon (see in details Chapters 4 and 5). Matching the supply and demand of skilled labour is another important task for HEIs, which can greatly contribute to the research, development and innovation capacity of the region, particularly in light of the efforts in place to promote smart specialisation. HEIs in Moravia-Silesia face difficulties in aligning their skills offer with the labour market demand. Graduates of Bachelors' degree programmes have currently a lower unemployment rate than graduates with Master degrees. While this can be partly explained with the continuation of studies at master levels, it also points towards a possible in the employment policies of large companies in the region (today a common phenomenon in many regions) towards cheaper skilled labour force (see Chapter 2 for a detailed discussion).

Lack of critical mass and funding is challenging R&D success.

Developing a solid basis for R&D activities is a challenge for the HEIs in the region, which lack funding and critical mass. For example, OU's R&D outputs are produced by a small number of people who work in the separate research centres. Currently, 11% of academic staff produces almost 75% of research outputs. The two small private institutions have ambitions to transform themselves into research-based institutions but are developing their capacity from a low base and lack critical mass and R&D traditions.

The proportion of researchers in Moravia-Silesia's higher education sector is a little above the national average (4.6%) placing the region at the third rank in the country. With regard to the number of researchers in non-HEI research centres, Moravia Silesia ranks only 10th.

Most of the Higher Education R&D spending is directed at VSB-TUO, which receives a lion's share of research public funds allocated to the region (Table 6).²¹ However, the volume of (national) public funds allocated to individual HEIs for R&D is low: for VSB-TUO it is 3.45% of the total for all Czech HE, and even lower for UO (0.56%) and SUO (0.36%). From the total Czech HE budget (block grant) these three universities receive less in relative terms under the quality and performance item than for the study programmes item (4.04% and 5.73% for VSB-TUO; 2.75% and 2.8 % for UO and 1.25% and 1.84% for SUO). These figures reflect the R&D gaps of Moravia-Silesia's HEIs compared to universities such as Charles University and the Czech Technical University in Prague or Masaryk University and the Technical University in Brno.

The EU Regional Operational Programmes provided funds for the VSB-TUO R&D infrastructures for the supercomputer IT4 Innovation Centre of excellence, energy research and advanced materials projects, the automated transport centre, the processing of waste programme and

²¹ University research outputs are calculated according to a methodology defined by the Czech Research and Development Council. The evaluation takes the form of a rating measuring the RDI results obtained by the research projects conducted in the universities. According to this methodology, the highest RDI outputs in the Czech Republic are registered by two institutions in Prague: Charles University (544 458 points) and Czech Technical University (235 606 points). The HEIs' in MSK receive the following points: VSB-TUO 72 274 points, UO 28 607 points and SUiO 14 907 points. This indicator-based evaluation and funding system is currently under revision due to the outcomes of the external evaluation which revealed a range of unintended impacts on institutional and individual behaviour (See also Chapter 6).

the Institute of Cleantech. EU funding also went into the UO for medical research and to SUO's mathematical institute.

On the business side, R&D expenses are concentrated in a small number of large international corporations, such as OKD, Arcelor-Mittal, Vitkovice, Bonatrans, Continental or Hyundai, who have their R&D operations also located elsewhere.

Overall the research funding for the HEIs in the region are limited as Table 6 shows.

Table 6. MSK HEIs' research funding (M EUR), 2012

	VSB-TUO	UO	SUO	BSO	CoSaAA
National Funds for research	20.6	3.8	2.5	n.a.	n.a.
Regional Operational funds	50.0	n.a.	8.7	n.a.	n.a.
Industry	3.4	0.06	n.a.	0.3	n.a.

Source: Kolar and Komensky, 2013.

University-business collaboration are limited to few cases of collaborative and contract research.

University-industry collaboration remains limited apart from the collaborative research in VSB-TUO where research financed by industry accounts 13.5% of the total research funds, being significantly higher than the Czech average of between one and two percent. In general, however, industry tends to cooperate mainly with Research and Technology Organisations such as VVUU (formerly Scientific Research Coal Institute), VUHZ (Institute for Advanced Metal Technologies) or Material and Metallurgical Research. In UO collaborative projects remain marginal, while SUO receives no money from the business sector.

Applied technology results are significant only in the case of VSB-TUO where they account for 45% of the research output points. Research outputs of UO and SUO stem predominantly from fundamental research and publications of articles (over 98% of their output). VSB-TUO established in 2012 the Department of Commercialisation of Research Results as part of the Centre of Innovation Support (CPI) (Box 3.2.). The number of start-ups and spinoffs incubated is promising: seven new firms were accepted in the period 2011-2012. The university provides assistance through direct funding, discounted consulting and rent services to these new enterprises but there is room for improvement.

Recently a new practice has started VSB-TUO, that is, to map potential commercial applications of R&D outputs through a network of technological scouts which are professors or researchers that are appointed by faculty deans.²² While these technological scouts can help generate a much needed cultural change within their faculties, international experience shows better results when the scout positions are filled by industry professionals who have market expertise. University professors or researchers are often more oriented towards technology push approaches and may fail to evaluate the market potential for new products.

A challenge for all HEIs in the region is that they lack strong multi-stakeholder partnerships. In an international comparison we see that these partnerships are often established through alumni and mobility activities of staff and students. Interviews during the OECD visit revealed a lack of

²² In 2012, 16 patents were registered, licence agreements generated revenues of about EUR 1 000.

cooperation with alumni. There seems to be a general need to improve the opportunities for staff members and students to gain industry experience through mobility schemes (see Chapter 2).

Organising interdisciplinary and inter-institutional collaboration across HEIs is difficult.

HEIs in Moravia-Silesia, as elsewhere in the Czech Republic, traditionally had limited interdisciplinary collaboration across faculty boundaries. Much of the perceived reluctance to engage in interdisciplinary R&D activities is the result of the policy and HEI-internal governance systems (see Chapter 5). Disciplinary thinking and silo approaches are therefore frequent. However, there are signs of change as the recent presence of multidisciplinary initiatives suggest. At VSB-TUO, the research infrastructure is being overhauled and extended to domains requiring multidimensional expertise such as clean mining or integrated safety system. At SUO, the Centre for Empirical Research and the Centre for Audiovisual and Creative Industries are also serving this purpose. These new cross-disciplinary centres can help to change mind-sets and introduce structures that are more conducive to research, development and innovation than single-discipline, single-institution and a mere focus on professors and researchers leaving apart students.

VSB-TUO, UO and SUO aim at fully transforming themselves into research universities. They employ different approaches and mechanisms. Despite obvious complementarities, inter-institutional collaboration efforts remain limited. The potential for collaboration is overlooked and bottom-up initiatives for collaboration within universities are scant. VSB-TUO is interested in medical and bioengineering research undertaken in UO but so far no progress has been made in terms of concrete collaboration apart from activities in the ICT. Due to the difficulties of cooperation at the institutional level, initiative is left to professors and researchers. Interviews with the SUO faculty revealed a perception of an “empty intersection” for cooperation in mathematics and other fields of basic science. Collaboration appears to be easier at international and national levels (*e.g.*, UO and Masaryk University in Brno) rather than within the regional. It seems that underlying this lack of collaboration is also the general reluctance of HEIs in the region to strengthen their third mission.

Four formalised incubators are in operation in Ostrava city. Despite the fact that these incubation facilities are all in close proximity to each other, collaborative efforts remain negligible and there are too few examples of start-up teams/tenants that belong to or come from the different higher education institutions in the region. VSB-TUO has established its own Innovation Support Centre (CPI) with 45 staff members. CPI provides assistance with technology transfer, project management, and incubation facilities and support services. It also hosts the final pitches of the regional business ideas and start-up competition Green Light (see Chapter 5).

Box 14. VSB-TUO Innovation Support Centre (Centrum podpory innovaci, CPI)

The Innovation Support Centre at VSB-TUO has a broad mission to promote entrepreneurship, technology transfer, project support and popularisation of science. It employs 45 staff (FTE) and operates entirely on external funding.

CPI supervises the VSB-TUO business incubator (PI VSB-TUO) and the Green Light Start-up Accelerator. So-called “Apple Juice” meetings are regularly organised to bring together students, researchers and people from firms who are interested in innovation and entrepreneurship. Usually renowned experts are also invited to these networking events. The Innovation Support Centre also provides information on business regulations, intellectual property rights, feedback on business plans, coaching and location support for students and graduates who want to start-up a business. Presently approximately 10% of the students taking part in the Centre of Support to innovations’ activities create a start-up and join the incubation programme.

CPI serves as the regional EURAXESS office and it is the regional contact organisation for the EU 7th framework programme in the region. It obtained EUR 20 million funding for the mobility of researchers in the

period 2012-2015.

Environmental challenges offer opportunities for research, development and innovation.

The city of Ostrava and the wider region suffer from significant environmental stress. The persistently higher than average pollution levels in the region have adverse effects on human health and the region's image. Efforts to counteract these are underway and some progress has been achieved over the years. For example, the water quality improved, one fifth of the region's territory is now a protected area within the Natura 2000 framework of the European Union. The region invested CZK 2.1 billion in environmental protection per year at the end of the 2000s but currently this investment seems to be declining.²³

There is a continuous need to widen and enhance environmental protection measures and there is much underutilised RDI potential, which involves all HEIs in the region. Some responses already exist, however advanced by single HEIs and not the result of collaborative efforts. VSB-TUO established the Institute of Environmental Technologies and the Institute for Clean Technologies for Mining. A new technology infrastructure was established notably on safety technologies and environment related systems. SUO has created a bachelor degree in environmental impact monitoring. These, also relatively recent, initiatives have not yet produced significant results and would benefit from stronger strategic anchoring and inter-institutional collaboration. For example, interdisciplinary collaboration between VSB-TUO and UO's Medical Faculty could bring significant improvements for the regional population. Also, the collection of statistics about the impact of air and water pollution on regional population and the health costs would justify increasing public investment on clean technology R&D.

Recommendations

Promote a new strategy for excellence and innovation within HEIs, taking into account niche technologies and the region's cultural richness. In the region's RIS3 strategy the emphasis is on technology sciences whereas environmental protection and the cultural richness of the region are not prioritised. A rethinking of the strategy process within the HEIs should focus on niche areas in line with the local labour market demand and the region's comparative advantages. A case of inspiration is Dresden where the Technische Universität Dresden (TUD) which has developed a balanced strategy which highlights not only technology fields but also non-scientific disciplines. The Technical University of Dresden has been selected in 2012 as one of the 11 "universities of excellence" in Germany. Moreover the university is rooted in its region and constantly improves the performance in the humanities as well as in scientific fields. A similar strategy could be applied by the HEIs in Moravia-Silesia building an alliance involving all HEIs in the region and regional stakeholders. The alliance could develop a joint initiative to attract top talents –students and researchers – to Ostrava by taking full advantage of the local cultural assets.

Box 15. The DRESDEN Concept (DE)

The DRESDEN Concept builds on quality R&D and the region's potentials of integrating the capacities of a

²³ See Regional Government of Moravia-Silesia (2009): Regional Development Strategy 2009-2020.

wide range of local assets and players. The Technical University of Dresden took on a leading role bringing in its broad range of fields including engineering, mathematics and sciences, humanities and social sciences. It ranks on 207 in Scimago and is the 13th university for research in Germany. 40 % of its research publications involve cooperation with foreign institutions and 10% of its students are on incoming mobility.

“DRESDEN” is not only the name of the city but also an acronym for “Dresden, Research and Education Synergies for the Development of Excellence and Novelty”. The DRESDEN Concept is an example of a university that takes the regional lead in leveraging the potential of its own competences in the field of Humanities and Social Sciences which helps improve the region’s image and promotes it as an attractive location for science and scientists.

Higher education institutions in Ostrava have different specialisations and all carry potential contributions for the development of the city and the region. DRESDEN Concept is an inspiring practice because it unites 24 partners of which some have very different research areas. Building on this diversity a diverse range of education, training and research opportunities was established. TUD offers over 100 individual courses of study with interdisciplinary work leading to highly respected degrees over a very large spectrum of subjects.

Source : www.dresden-concept.de/en/alliance/mission.html

Develop HEIs’ regional and trans-border cooperation and link it with a third mission strategy. Strengthening the co-operation between the public universities, possibly also involving the private HEIs is a way to build critical mass in a number of research fields. It can favour multi- and interdisciplinarity in research and enhance the societal and local relevance of research. The example of research consortia, now a common practice of Finnish universities, provides inspiration of how this could be organised.

Box 16. Research Consortium of Finnish Universities (FI)

Since 2004 university consortia have been part of the Finnish higher education system. They operate in six locations: Kajaani, Kokkola, Lahti, Mikkeli, Pori and Seinäjoki. University consortia implement the third statutory mission of Finnish universities: furthering the social impact of research and education. Their impact is based on research in support of regional development and education offers at master and postgraduate levels, including also adult education programmes.

The Finnish model is relevant for HEIs in Moravia-Silesia because it achieved results. It has succeeded in raising the level of quality, impact, competitiveness, and appeal of HEIs and R&D activities in the six provincial centres. University consortia gather universities under a single umbrella. The consortium does not only promote interdisciplinary aspects but also the regional impact of universities and the interactions with society. Partnerships are often difficult to establish between universities especially when their size are substantially different. However when the process is sufficiently bottom-up, chances of success are significantly enhanced. The model can be also applied to the trans-border context. PROGRESS 3 is an example of a successful interregional consortium. Lessons learned should be applied to other initiatives. Moravia-Silesia could play a leading role in launching transnational projects given its historical ties with the Silesian Polish regions.

Source : www.oulu.fi/kajaaniuniversityconsortium

Strengthen knowledge exchange and transfer efforts through a common interface and increased mobility between academia and business. Interactions between HEIs and businesses, especially what concerns SMEs, are weak in the region. Innovation vouchers only had little effects and contract research is limited to the large international corporations. What HEIs offer seem to be not what is demanded by businesses in the region. Especially the RDI needs of those SMEs in the clusters seem to be unknown to HEIs (or not being acted upon). Developing a "Business/SME Forum Function" involving all HEIs in the region could be a way to bridge this gap. The Knowledge House in the North

East of England is an inspiring example. Increasing the mobility of people between HEIs and industry facilitates knowledge transfer and exchange between academics and business people; this can be achieved through targeted programmes, as the Project Interchange at the University of Almeria illustrates.

Box 17. Forum function roles of universities: creating public spaces

Universities can provide a public space in which future direction of technologies, markets and local industrial development can emerge. This public space or forum function role can take many forms, including meetings, conferences, industrial liaison programmes, standards forums, entrepreneur/investor forums, visiting committee discussions of departmental curricula. The conversations between university and industry people which take place in these spaces rarely focus on solving specific technical or commercial problems, but may generate ideas that can become the focus of problem-solving both in industry and in universities.

Small companies do not interact much with universities but good communication policies on the side of the university can mitigate suspicion or indifference of firms. HEIs often underestimate the importance of their public space role and its contribution to local/regional innovation systems. Consequently, universities' forum function role often remains underdeveloped.

Moravia Silesia is the Czech region with the lowest number of SMEs per 1000 residents. However during the growth period 2003-2008, some catching up has taken place. Through the establishment of forum areas, Ostrava HEIs can help fostering the circulation of knowledge towards existing SMEs, new firms and clusters and stimulating innovation. According to their specialisation, Ostrava HEIs could prioritise their connections with the cluster emphasised above and target firms in the supply chain of the international corporations in the region.

Source: Lester, R.K. (2005), Universities, Innovation and the Competitiveness of local economies, A summary report from the Local Innovation System (LIS) Project: Phase 1, Industrial performance Center, MIT, Cambridge.

Box 18. The Knowledge House – a collaborative network to support SMEs (UK)

Knowledge House (mid-1990s – 2011) was a joint effort of the five universities in the North East of England to provide a one stop shop for industry enquiries. (In 2011, the Knowledge House operations were dispersed to individual universities). Knowledge House could be accessed via a central node, based at a Regional Technology Centre, or any of the five university nodes. The network and its operations were supported by a web-based enquiry handling/project management and client relationship management system. Knowledge House generated an income in excess of GBP 13 million for its universities from over 1 300 projects since 1996, with GBP 7.6 million of this coming in the last four years. Knowledge House's profile rose significantly over time, with more than half (60%) of all enquiries generated since 2003. In 2007, Knowledge House generated GBP 4.7 million for the participating universities by delivering 364 completed projects from over 800 business enquiries. Business growth averaged 25% since 2000.

HEIs in Moravia Silesia need to depart from the current focus on large business (mining) culture and to support SMEs. Services to industry are underdeveloped or large firm oriented in the region but HEIs could bridge this gap. Knowledge house is an example of what can be done.

Source: OECD (2012).

Box 19. Project Exchange at the University of Almeria (ES)

The Project Exchange, established in 2009, increases the exchange mobility of university staff and senior managers in industry and public sectors. On average, 50 professors from 15 departments (often represented are mathematics, biology, business, agriculture sciences and law) participate per year in a 1-7 month exchange period, and 50 people from industry and public sector temporarily join the university (often participants come from

construction, justice, health sector, marble industry). Project Exchange is managed by UoA's social council. The Mediterranean Foundation of UoA is also involved. The outcomes of the scheme are systematically monitored. All participants prepare a report on their experiences during the exchange period. So far the outcomes have been encouraging. For example, companies show high level of satisfaction and are more eager to engage in long term collaboration with the university. The programme has also helped to change mind-sets within academia and created a climate conducive to the emergence of joint projects.

In Moravia Silesia, HEI-business collaborations should be increased. Mobility schemes can be a successful approach. Since it is likely to be difficult to organise mobility as academics and business people have busy agendas, it is important to keep the programme at a small and manageable scale – at least initially. To increase efficiency outcomes should be systematically monitored.

Source: OECD (2010).

Encourage and reward HEIs to address regional challenges. Local and regional authorities and HEIs in Moravia-Silesia could be inspired from the Kitakyushu case in Japan, which is about a city that has found new sources of growth by turning former disadvantages into comparative advantages. In order to strengthen their environmental engagement and contribution to social cohesion, the HEIs in Moravia-Silesia could consider establishing sustainable innovation labs, following the University of Rotterdam model, by building a hub where external stakeholders, professors researchers, and motivated students join efforts in creative environments. For this, connections should be established with a number of regional firms, public sector organisations and NGOs, as well as a network that links all labs with each other.

Box 20. Kitakyushu: how to build a green & vibrant city (JP)

Once a vibrant but heavily polluted steel producing and shipbuilding region, Kitakyushu has repositioned itself as a green city. Kitakyushu has been engaged for the past 30 years on a new industrial trajectory emphasising green growth and prioritising environmental protection investment. The focus has been put on firms providing goods and services with high environmental performance (also known as Eco Premium), and industries such as renewable energy, smart grid or clean technologies. Another target has been the industrialisation of the environment, which leverages environmental technologies for industrial development, such as promoting resource recycling in the waste disposal industry and recycling industry, and takes environmental measurements and steps to prevent pollution. Kitakyushu's green growth initiatives include an eco-town recycling cluster and ongoing investments in green city demonstration projects such as the smart community trial in one of its districts.

A number of local academic and research institutions have been instrumental in streamlining the effort towards sustainability. HEIs in the city and the neighbouring areas have established graduate schools in the Kitakyushu Science and Research park notably Fukuoka University, Waseda or the University of Kitakyushu. The Kitakyushu Foundation for the Advancement of Industry, Science and Technology (FAIS) has a mandate to attract researchers, professors and extent university research to the park. It acts as liaison and coordinator between companies and the universities and research centres. The growing number of international patent applications in green technologies indicates its strong innovation potential. Kitakyushu is also part of a green Regional Innovation System within northern Kyushu and Fukuoka prefecture and is increasingly making use of this system.

To improve its attractiveness and retain students, Moravia Silesia and in particular Ostrava city, need to focus more on environmental sustainability of their economies and greening of the city. Emission levels of major pollutants still exceed EU average. Significant efforts are needed to make the city and its surrounding cleaner. This requires greater mobilisation of all stakeholders for committed actions. A proactive strategy prioritising green growth and the protection of the environment, such as in Kitakyushu, would not only transform a drawback into an advantage but it will help the region and Ostrava city to reinvent itself by connecting with new global trajectories.

Over three decades, local and national governments have made concerted efforts to revivify and rebrand the city of Kitakyushu. It has undergone a slow but continuous transformation away from manufacturing towards continuously diversifying services. To reduce environmental externalities from heavy industry, strategic investment went into the recycling industry and increasing the energy efficiency of its major polluting industries.

Kitakyushu has also implemented international city to city cooperation for sustainable development in Asia and has steadily built a reputation amongst cities aiming for green growth.

Kitakyushu achieved important milestones in improving environmental conditions but this has been difficult to achieve and some challenges remain for example the high level of greenhouse gas emissions. Many objectives were attained because of the strong involvement of citizens and the constant focus on the dialogue between all stakeholders.

Citizen involvement and an all-stakeholder approach - made the Kitakyushu approach successful are not yet sufficiently prioritised in Moravia-Silesia – they need to become essential parts of the sustainable development strategy. The Regional Pact provides a very promising platform for this.

Source: OECD (2013).

Box 21. Rotterdam University's Innovation Labs (NL)

Innovation Labs develop new sustainable solutions to actual and persistent problems in the Rotterdam region. They bring together third and fourth year students and lecturers from different disciplines to collaborate in projects with the representatives of the knowledge triangle. These labs, which offer an innovative learning and working environment, are directly connected to the university's regional R&D themes. The projects are commissioned by the university's strategic partners.

The innovation systems of Moravia-Silesia and Ostrava lack dynamism and underutilises HEIs. This nevertheless needs to be organised. Innovation labs would provide a strategic framework for innovation generation at university level. Students from different fields of study would be challenged to contribute to the approach of multi-disciplinary problems from the viewpoint of their own disciplines. An inspiring learning environment would be created resulting in a strong concern for the problem at hand.

Rotterdam innovation labs, of which there are now eleven, are organised to provide the region with solutions to difficult local problems. Each year, or less in the case of very complex issues, new projects are selected in partnerships with strategic partners. It has been shown that methodologies used in the labs were too user centric and more emphasis is now given to co-creation and innovation.

The success of Innovation labs depends to a great extent to their visibility and openness. It is important to maximise interaction with the business community and users, but also to attract motivated and creative students from all faculties.

Source: OECD (2010).

Facilitate internationalisation of research in HEIs and local firms. HEIs have an important role to play in providing local players access to a global knowledge base and talents. International R&D collaboration of the HEIs and efforts to attract international top researchers to the region are growing and should be sustained. The ICREA programme in Catalonia provides an example for talent attraction. It has been emulated by many other regions throughout the OECD countries and continues its operations despite the financial and economic crisis.

Box 22. ICREA –Catalan Institution for Research and Advanced Studies (ES)

ICREA, Catalan Institution for Research and Advanced Studies, is a foundation promoted by the Catalan Government created in 2001. ICREA offers a new hiring formula for the Catalan R&D system to compete with other research systems on a similar -if not an equal- footing. Universities and the Spanish Research Council are based on civil servants as researchers and the model clearly has not been able to cope with the challenges that research has nowadays. There was (and still is) a clear need for a model with more flexibility, personalized, open

and adaptable to the real world of the most advanced research. ICREA's aim is to recruit top scientists capable of leading new research groups, strengthening existing groups, and setting up new avenues of research. But under a totally novel recruiting and contracting model, independent of the existing ones and similar to the models used in the most advanced research and higher education institutions. ICREA is an institution without walls. To achieve its objectives it works closely with Catalan universities and research centers by means of long-term agreements that allow ICREA researchers to integrate fully as group leaders within these universities and centers. ICREA open positions, evaluates, decides to who offers a contract, negotiates and signs a permanent contract with the researcher, who will carry out the research activities in one research place (University, Research Center) within Catalonia.

ICREA offers new research positions each year and continues to help increasing research quality in Catalonia. Cooperation, international openness, and excellence are ICREA's hallmarks. In fact many indicators show that ICREA has been able to recruit scientist at the higher possible level of excellence that were lacking within the standard system. But in fact we try continuously to get the whole research community to act as head hunters for ICREA. We drive the institutions to do an active search of candidates in a clear win-win strategy: they look for the researchers they want and if chosen by ICREA, the salary will be paid by ICREA. ICREA research professors (the "ICREAs") are selected by committees of international experts based on the quality of research that have been conducted and their leadership abilities. The selection process is based exclusively on personal merit, without any restriction on the distribution of ICREAs by field or type of host institution. There are no quotas. In fact ICREA works independently from the administration: it is an example of the long arm of the administration, which has majority in the Board of Trustees, but having organic independence and functional autonomy. And at the same time, ICREA is independent of the institution where the ICREAs will be allocated and work. Candidates who apply to ICREA must demonstrate a track record of high quality research and relevant international experience. The candidates must apply with at least one Host Institution in Catalonia willing to take them on board and to provide all the support and facilities. Nonetheless the position of ICREA is to actively work for the researcher, not for a particular host institution. We even promote concurrence among them: in some cases a selected candidate may negotiate with several possible host institutions to see which one offer the best ambience and working conditions.

Increasing the quality of Catalan public research system was, and is, a key motivation of the Catalan government. This includes opening up the system to a wider range of talent, with an emphasis to attract high quality international researchers. Thanks to it ICREA has been able to recruit researchers in emerging areas of knowledge and in interdisciplinary areas. ICREA is meant to overcome the existing rigidity of Catalan and Spanish systems that in practice, seriously compromises the possibility that many researchers (especially non-Spanish) can successfully investigate in Catalonia. Despite many attempts to mend the situation, there remain, in actual practice many institutional, cultural and legal barriers that limit the chances for extraordinary scientists to take up research positions in Catalonia. Featuring high on this list is the traditional "inbred" Spanish culture that tends to exclude outsiders, even Spanish or Catalan, who have been working abroad for long spells of time. To work around these difficulties, ICREA avoids traditional practices of institutional recruitment and adopts a simple, straightforward and highly flexible approach exclusively based on scientific excellence. ICREA relies heavily on the cooperation with the rest of the research system. Most institutions actively seek candidates that fit their research strategies, and support their applications to ICREA positions. ICREA then chooses and hires a few, who then get hosted by the research institution. The selection is made by panels of international experts in a two-step process: first online and then on face to face meetings, where decisions have to be unanimous. ICREA makes a point of never having experts working in Catalonia for these nor for any other committees. Those selected are offered a permanent employment contract, with periodic evaluations every five years, based on which salary increases occur. Salaries offered are competitive in the international arena and the conditions are negotiated individually. Once integrated, ICREAs develop new lines of research, attract research funds and act as a powerful catalyst for scientific and economic development of the country.

For 2014, the annual budget of ICREA is 26.5 million. Administration and recruitment costs are on the low end of a typical investigation agency, at 3% of the total budget: most of the budget is spent on salaries of researchers. ICREA provides an efficient and effective solution to the excessive bureaucracy costs identified in the Spanish research system. Since 2001, ICREA has hired a total of 323 researchers from 3287 applications in different areas of research: 28% in life & medical sciences, 26% in experimental sciences & mathematics, 14% in social sciences, 15% in different fields of humanities and 17% in technology & engineering. The current number of ICREA researchers -as of May 2014 is 242. According to an independent survey, as many as 85% of ICREA Research Professors would not have come to Catalonia had it not been for ICREA.

All ICREAs have significant international experience. Two-thirds worked outside Spain when they joined ICREA, mostly in the USA, Germany and the UK. Many of them have worked at prestigious universities such as

Harvard, MIT, Oxford and Cambridge, and in prestigious research institutes such as the CNRS laboratories and Max Planck, Bell Labs and the National Institute of Health USA. Just under half of the ICREAs (46%) are foreigners. In many instances, a willingness to return to Europe is cited as a strong personal reason to accept the offer to come to Catalonia. The ICREAs attract every year significant levels of research funding: 61.1 million in 2013, and coming from a wider range of sources than is normal in Catalonia. More than 50% of funding comes from non-Spanish sources like the European Union, and more than 15% from the private sector (industry and international foundations). The number of European Research Council (ERC) grants awarded to ICREAs best illustrates their high rate of success in international competitive calls for research funding. In 2013 ICREAs have won 8 of the new ERC Consolidator grants, 1 ERC Starting grant, 3 ERC Advanced grants, 3 Proof of Concept grants. Moreover, 2 ICREA researchers are PI of one Synergy project. These are all highly competitive grants that offer generous funding over a period of up to five years. Currently, about one in three ICREAs hold an ERC grant. Roughly, Catalonia concentrates about one half of all ERC grants received in Spain (121 out of 238), and ICREA concentrates half of all ERC grants received in Catalonia: without ICREA, the success rate of both Catalonia and Spain would be considerably lower.

ICREA Research professors have an outstanding publication record. The SCIMAGO INSTITUTIONS RANKING (www.scimagoir.com) ranks ICREA 74th in the world according to the proportion of publications in the top 10% of the most influential scientific journals. In 2013, ICREA researchers published around 2000 articles, books and proceedings, but the interesting point is not the quantity but the quality: we excel in indicators of quality and excellence. For all indicators independent of the size of the institution, ICREA is the first in Spain with a general scope (working in all areas), and ranked much better than the best Universities. The ICREA community exceeds the performance of comparative research groups at all levels, i.e., in Catalonia, Spain, the European Research Area and the rest of the world. The ICREAs are distributed among the different types of research institutions present in Catalonia. Most are based in universities (50%) and Catalan research centers (CERCA) (38%), the rest CSIC institutes (8%) and other research centers such as the Barcelona Supercomputing Center (4%). The 242 ICREA research professors have applied for a total of 130 patents, of which 21 are being exploited commercially as of 2013. In addition, have created 4 spin-off companies based on proprietary technologies. This represents a very high proportion of ICREAs, especially considering that the selection process is exclusively based on academic excellence. This in turn has led to an increase in industry funding, demonstrating that innovation and academic research are not incompatible.

Despite being only a small group of researchers, ICREAs example has increased opportunities for colleagues, students and junior researchers to work with and learn from high-quality teachers. As is usual for good research groups perpetuate in their success, the Catalan research system is positioned to continue improving its international reputation. Of course the integration of ICREAs within the research system is not exempted from some cases of conflict, mainly in the initial phases. Its fully integration needs that the institutions see that what is gained with ICREA is on top of what they have (professors, own researchers) and that they will gain from having new researchers that are not paid by the own budget: the win-win strategy has to be fully understood.

The presence of ICREAs has increased international visibility and reputation of the Catalan research system. Through their professional networks, ICREAs enrich the connections between the Catalan system and the international community of researchers, fostering opportunities for collaboration and funding and attracting more international talent to Catalonia. The cumulative beneficial effects that ICREAs bring to the Catalan research system contribute to an emerging mindset that is much more favorable to a recruitment system based on excellence and openness. This shift in thinking has the potential to foster a broader change in culture within the research system in the future, challenging the established prejudices and the deeply entrenched mispractices that still plague most academic life.

Source: ICREA (2014), presentation in the OECD review findings workshop, jointly organised with the Ministry of Education, Youth and Sports in Ostrava on 8th October 2014.

Devote more efforts and funding to retaining talents in the region. Brain drain is a main issue in the region which jeopardises its long term future, given that those leaving Moravia-Silesia are usually the most skilled individuals. HEIs should be encouraged to develop projects that help retain alumni in the region. In several OECD regions, institutions have taken steps to provide work-based learning experience for high potential graduates. The Saxion University of Applied Sciences in Twente (Netherlands) has organised an educational trajectory “Fast Forward” for students towards the end of their studies and graduates which has a strong component of work-based learning in different regional

workplaces. Given that work-based learning is insufficiently developed in Moravia-Silesia, this type of programme could be considered as a reinforcement of the regional innovation system.

Box 23. Fast Forward: Creating Opportunities for Graduates to Stay (NL)

Fast Forward is a separate post-graduate programme provided by Saxion Universities of Applied Sciences in Twente to retain high potential graduates in the region. Over a two-year programme the Fast Forward trainees receive tailored management training and undergo three eight-month work assignments in different private companies and public organisations in Twente and surroundings. High potential graduates are matched with their temporary employers. The programme has also encouraged new graduates to move to Twente from other regions in the Netherlands.

For a graduate, Fast Forward provides a personal development project with self-awareness training, peer development, continuous assessment and feedback from peers and coaches. In six years, more than 200 Fast Forward apprenticeships were completed with about 100 different employers. The programme has been successful in retaining graduates in the region: 95% of Fast Forward graduates – now highly qualified – have stayed in the region and work there.

A programme, similar to Fast Forward would increase mobility for students of HEIs in Moravia-Silesia, and it would also expand – both in terms of quantity and quality – the HEI-business relationships.

Source: OECD (2007), Higher Education and Regions: Globally Competitive, Locally Engaged, OECD, Paris.

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CHAPTER 3

ENTREPRENEURSHIP EDUCATION

Tomas Karlsson

New ventures and small companies are a key source for employment growth and industrial restructuring. HEIs can support new business generation and SME development through entrepreneurship education. This chapter examines the effectiveness of current policies and practices in entrepreneurship education in the HEIs in Moravia-Silesia. It concludes with recommendations for the future, highlighting good practice examples from HEIs in other regions.

Introduction

The fate of regions in Europe depends on their ability to renew themselves through a dynamic and thriving growth of new and expanding small businesses. Large and old companies and industries contribute to a net loss of jobs, while the majority of new employment opportunities in the western world stems from new and small businesses (Birch, 1979; Storey, 1994; Davidsson, Lindmark and Olofsson, 1994). Hence, entrepreneurship is an important driver for local economic development

Higher education institutions can contribute significantly to entrepreneurship and innovation in a local economy. Besides commercialisation of research results and start-up support, HEIs can contribute in the promotion of an entrepreneurial mind-set of students, academics and other groups and related actions. To do this, higher education institutions need to consciously promote awareness of entrepreneurship as a career choice, motivational activities and participation in entrepreneurship education. This supports the development potential of a region in the short, medium and long run.

Entrepreneurship education can generally be defined as educational activities, which motivate for and inform about entrepreneurship and develop certain skills which allow individuals to recognise opportunities and to translate these into business ideas, which ideally get implemented in practice. Entrepreneurship education works best when it is an integral part of study programmes, it is not limited to business studies, and offers opportunities for interdisciplinary activities. Since the mid-1940s when the first course in entrepreneurship education was held at Harvard, entrepreneurship has made its way into higher education. Previously seen as part of universities' third mission, the current trend in Europe promotes entrepreneurial thinking and action across teaching and research, and anchors entrepreneurship in the strategy and the organisational capacity as the OECD/EC HEInnovate initiative shows.

Moravia-Silesia has many reasons to boost entrepreneurship education in HEIs. The economic transformation challenge, the pressures on the environment and outward migration tendencies are pointing towards the need for a more proactive and engaged higher education, which identifies problems through divergent and convergent modes of thinking, and proposes solutions which provide benefits to current and future generations. As the previous chapters have shown, there are abundant possibilities to increase collaboration between the HEIs and to enhance their individual and collective co-operations with regional employers. Moravia-Silesia's mix of HEIs with institutions of different age, culture, history and academic focus allows for diverse approaches and significant potential for

development in terms of blending domains and competencies. This provides a rich and diverse basis for innovation and entrepreneurship.

As noted in previous chapters, Moravia-Silesia has a high number of students, which provides significant potential for entrepreneurship, especially when awareness creation, motivational activities and entrepreneurship education are broadly practiced. Since students generally continue their studies to master's programmes, they can during the course of their studies have extended exposure to entrepreneurship. Highly skilled individuals who are knowledgeable about entrepreneurship are required not only in start-ups or other ventures, but also in established companies and public sector organisations which are needed of reforms. Also, students who study abroad are likely to return to their home institutions with a more opportunity-driven view of what and how to continue their study programme and often more open to new opportunities, such as starting up their own business. The critical mass of students opens the way for student-driven entrepreneurship activities outside the curriculum as a supplement to the formal university initiatives and activities which are directly linked to the study programmes and the curriculum.

Due to the industrial restructuring and the exodus of high skilled young labour force from Moravia-Silesia, venture creation and small business development are particularly important. The key issue for the region and its HEIs is how to retain university graduates. An increased focus on entrepreneurship education can facilitate the retention of graduates and positively impact on the industrial restructuring in three different ways.

1. Entrepreneurship education can facilitate a change in the mind-set so that HE graduates will create new jobs.
2. Entrepreneurship education can shift the focus from reliance on large firms towards endogenous growth and generation of new rapidly growing SMEs which can create high skilled jobs.
3. Students trained in venture creation develop skills and competences also required for developing existing businesses, which will improve the ability of the established business community to adapt to the ongoing structural changes.

Findings

In addition to the factors that drive the need for entrepreneurship education in Moravia-Silesia, policy makers and practitioners in HEIs also need to address a number of key challenges which are specifically related to the development of entrepreneurship education. These include: the weak focus on entrepreneurship, third mission activities and commercialisation of research, the lack of adequate structures in entrepreneurship education, the prevalence of approaches to teaching and learning which are not conducive to entrepreneurship and innovation, the underutilisation of student potentials to improve teaching and learning, and the insufficient interdisciplinarity and collaboration within and across HEIs.

HEIs have a weak focus on entrepreneurship, third mission and knowledge transfer.

The public universities in Moravia-Silesia – VSB-TUO, UO and SiUO – currently have a weak focus on entrepreneurship. Despite the co-existence of different definitions in the international context, entrepreneurship commonly refers to innovation, often in the form of new business start-ups. HEIs in Moravia-Silesia, with the exception of the Ostrava Business School, tend to perceive entrepreneurship as business administration or as “Finding and using opportunities” or “Trying to find the resources to exploit opportunities.” While HE staff, for example in VSB-TUO, may have a broad understanding of

entrepreneurship, encompassing both renewal of established businesses and venture creation aspects, teaching models seem to focus on general principles of management, rather than the principles of new venture creation.

There is significant underutilised potential for third mission and entrepreneurship activities (see also Chapter 3). Within the VSB-TUO, the innovation support centre, business incubator and the science park are new developments. They struggle with funding issues and a lack of support from academic staff. The Science and Technology Park which is a triple helix effort bringing together VSB-TUO and University of Ostrava as co-owners, is currently underutilised and lacks a science component, because there are no projects founded by university scientists. VSB-TUO's industry collaboration has a strong focus on large organisations. While such organisations have scale advantages and prestige, they may not always offer the best possible practical setting for students for the application of knowledge at an early stage.

The University of Ostrava and the Silesian University of Opava have not yet developed their own approaches to third mission, regional engagement and entrepreneurship which tend to be perceived in narrow terms. The University of Ostrava regards third mission activities and entrepreneurship mainly as collaboration with business and industry and as such more suitable for technological universities or business schools. There is limited acknowledgement of the transformational role which social sciences and arts can play in regional and local development and in entrepreneurship. In the Silesian University of Opava, regional engagement and entrepreneurship are considered mainly as issues relevant for the School of Business Administration in Karvina, despite obvious potential with other faculties and their departments, for example, tourism and health sciences.

In a similar vein, HEIs in Moravia-Silesia should develop their own research base on entrepreneurship. Currently where such research exists it is in need of strengthening and refocusing. For example in the case of the Silesian University of Opava, research in entrepreneurship is currently focused only on small and medium-sized business, but could also focus on young business or research commercialisation. The current emphasis on business succession could be a good starting point to develop both research and education programmes. Also, Ostrava Business School lacks its own research and theoretical development of entrepreneurship education.

There is a lack of adequate structures in entrepreneurship education.

Specific structures which facilitate entrepreneurial development across all activities are crucial for universities who wish not only to deliver entrepreneurial learning, but also to be entrepreneurial in their other activities.

Currently the HEIs in Moravia-Silesia are not structured in a way that stimulates and supports the development of entrepreneurial mind-set and skills. The academic support for entrepreneurship is fairly weak across public HEIs that train the majority of HE students. There are no professors dedicated to venture creation and research commercialisation with the exception of the recent VSB-TUO technological scouts. In general, while some staff members may have an interest in entrepreneurship, there are no specific departments or organisational units that would have entrepreneurship as a primary focus.

The absence of university positions in entrepreneurship and the lack of attention amongst academics have significant consequences. Engaging students to take interest in entrepreneurship becomes a challenge, support for students and staff who are interested in entrepreneurship becomes shallow and consulting oriented and research-based development of entrepreneurship curricula becomes scarce. There is no one who can spearhead developments in entrepreneurship education.

Without broad academic support, only students who are self-motivated to pursue an entrepreneurial career will find their way to the support organisations, and it is difficult to expand the pool of people interested in innovation and entrepreneurship.

The methods and models of the support structures will not be based on current developments of entrepreneurship research, and run the risk of being misdirected or obsolete. Stepping up entrepreneurship education offer would require enhanced in-service training for staff or new external recruitment to ensure that staff is trained in current developments in entrepreneurial pedagogies and connected to international entrepreneurship research.

Recently new mechanisms have been established to support the development of entrepreneurial mind-sets and skills in VSB-TUO, most notably the Green Light Business Accelerator and competition. Also Ostrava Business School has an incubator (see Chapter 5).

Teaching and learning do not support entrepreneurship and innovation.

It is generally argued that entrepreneurship education requires pedagogies which stimulate critical thinking and creativity and thus need to go beyond the classical chalk-and-talk frontal teaching approaches, involving student-centred activities, problem-based and experimental learning, and gaining of practical experience, which is incorporated into learning in classroom. In universities committed to entrepreneurial learning, skills are not just delivered through traditional lectures; many other approaches are taken to produce the desired learning outcomes. Its best to have a range of approaches, as different subjects/topics can be best served by different approaches. Students also respond differently to different methods. The key is to enhance the student's ability to think and respond entrepreneurially.

Current approaches to teaching and learning in Moravia-Silesia's HEIs, with some exceptions amongst the younger faculty, do, however, not meet these requirements. The current pedagogy is dominated by traditional teaching methods such as labs and large scale lectures, while exams focus on declarative skills. The isolated examples of the use of case studies, games and simulations include the Food simulation game developed in the VSB-TUO Business School (Box 6.). While this game has been developed by local staff and is popular amongst students, so far no efforts have been made to develop it further, for example by extending to other industries. Due to the lack of support and important horizontal services (see Chapter 5), positive initiatives are only rarely scaled up to a system. Students have limited opportunities for experiential entrepreneurship learning, self-managed learning, student-led lecturing, teaching led by entrepreneurs, problem-based learning, or reflective exercises. Acquisition of functional skills and soft skills is limited as noted in Chapter 1. Students interviewed in public universities reported a lack of opportunities for work-based learning in businesses, limited exposure to real life problems, lack of business contacts and outdated knowledge of instructors. There are rarely examples of interdisciplinary courses, where students would meet their peers from other faculties, and there is a lack of promotion of creativity. Some students in bigger institutions perceive that universities have a lack of focus on individual student's progression and employment, but only deal with masses. Students have limited opportunities to influence instruction, content, courses offered and examination of classes. It is unclear as to how effectively student feedback is taken into account to develop course contents and to make it more entrepreneurship oriented.

Box 24. Food simulation game at VSB-TUO business school

The food simulation game at VSB-TUO business school enables students to develop functional skills with respect to decision making, and is enjoyable by both teachers and students. The game promotes the students feeling of competitiveness, and is a clear practical exercise, in the format of a computer game. The game can be

played with 8 companies, with 2-3 teams representing each company. Each student gets a dedicated role, e.g., research and development, marketing manager and Chief Executive Officer. Each simulation is supposed to illustrate the product lifecycle, from the development and launch of a new product, to product maturation and eventual decline. The game is played in several rounds. Performance is based on the competitive position of other teams. This means that simulations rarely would turn out exactly the same. Each round new prices, investment, budget allocation. One round takes a quarter of a semester.

The reasons for the lack of focus on student-centred learning are linked to national policy framework including funding, governance and quality assurance policies, and also institutional strategies (see Chapter 6). The cuts in education budgets have led to increasing class sizes which do not facilitate student-centred learning approaches. The national accreditation system drives uniform education provision focusing on traditional academically oriented programmes. The decentralised institutional governance system reduces the ability of institutions to develop important central services. There are currently no dedicated pedagogical support centres or quality teaching centres in Moravia-Silesia's HEIs which could drive pedagogical reform in institutions. Pedagogical development remains underdeveloped across institutions apart from the Ostrava Business School which as a private institution is accessible and attractive only to a small proportion of students. The University of Ostrava has made efforts to improve the quality of teachers and learning processes, but in line with the national accreditation system this has focused on a rigorous system of pre-accreditation of degree programmes, rather than support for quality teaching or systematic pedagogical development. The absence of dedicated professors in entrepreneurship makes difficult to push the entrepreneurship agenda and to monitor the progress of entrepreneurship content in education provision. Without professors, there is no power to develop new courses and programmes in entrepreneurship and influence university strategies.

While the HEIs in Moravia-Silesia have not yet embedded entrepreneurial behaviour in the learning experience, also the portfolio of accredited programmes related to entrepreneurship remains modest (Box 7.). Apart from the private institution Ostrava Business School, only isolated courses in entrepreneurship are available and no courses oriented towards venture creation. In line with the limited offer of courses in entrepreneurship, there is little clear indication that current research results in entrepreneurship would be used for education and training.

Despite the current modest performance in entrepreneurship education, HEIs in Moravia-Silesia are gradually building the basis for more concrete action. The key university in the region, VSB-TUO has developed extra-curricular activities which help develop entrepreneurial mind-set amongst students. These activities include the Green Light competition and accelerator; both hosted by the VSB-TUO (see Chapter 4).

Box 25. Entrepreneurship education practices in HEIs in Moravia-Silesia

Entrepreneurship is taught in several universities in the Czech Republic, including the Czech Technical University in Prague (Industrial Commercial Engineering study programme) and the Czech University of Life Sciences also in Prague (Economic Policy and Administration Programme). There are also courses on financial entrepreneurship in Masaryk University in Brno. In Moravia-Silesia, entrepreneurship courses are being offered within the framework of Trade and Services Curriculum (SUO), economic and law diplomas (VSB-TUO) or Philology (OU).

Ostrava Business School is one of the first private higher education institutions in the Czech Republic and features a modern approach to pedagogy, entrepreneurship and graduate employment. Its teaching is exclusively centred on entrepreneurship issues, linked with trade, management of the environment, informatics, Internet etc. Training involves entrepreneurial thinking with emphasis on both theoretical knowledge and practical skills. Teaching and learning are strongly influenced by innovative and modern pedagogies such as problem-based

learning and current entrepreneurship theories. Since the year of inception (2000), 3 000 students have graduated from OBS. Graduates who in general have robust employability outcomes (98%) and have higher than average salaries for the region. OBS sees entrepreneurship as a distinct topic separated from business administration and uses progressive teaching models from leading international universities. For example “Didactics of Entrepreneurship”, a master’s level course in business administration, run by Lucas Durda, a PhD student, is an example of a modern entrepreneurship course, aligned with current entrepreneurship research, and development in theory and pedagogy. The inspiration for the course is drawn from the leading European business schools, such as INSEAD and Ecole Polytechnique de Lausanne. This course shows that it is possible, with limited means, to create innovative, cutting edge education provision in entrepreneurship, which can help increase the number of students interested in starting their own ventures. This is necessary to bring more activity into business incubators and science parks, and to improve the overall entrepreneurial competences.

Students remain an underutilised resource in education, R&D and extracurricular activities.

While HE staff may be overloaded with their “normal” functions to develop robust outreach activities and new innovative initiatives in entrepreneurship, part of this work can be driven by students themselves. Currently, HE students in Moravia-Silesia remain an underutilised resource in education activities, R&D and extracurricular activities.

While commendable work is undertaken by student associations such as AIESEC, the ESC and the FILLUP in VSB-TUO and AIESEC in Silesian University of Opava, interviews with students revealed untapped potential for student engagement in the institutional development of the universities. Examples of areas where students could play a more meaningful role include third mission activities, student support activities, internationalisation, educational development and research.

Students could be helpful in reaching out to the SME population which is notoriously difficult to access for larger universities. Moravia-Silesia’s big business culture impacts university-industry collaborations which tend to focus on large firms, at least in the case of VSB-TUO. Students could be used to facilitate the collaboration and development of small businesses in the region. While the SMEs may lack prestige and ability to pay for university services, they provide excellent training and learning opportunities for students. Usually small businesses need to develop the professional side of their business, where students normally can contribute. In addition, students could engage with small business problems fairly rapidly, as the problems are less complex, and it is easier to get time with the top management.

Students could also drive the alumni relations which represent strong development potential, as is evident from the VSB-TUO’s Career Fair which is an excellent example of collaboration with external stakeholders, and the engagement of students (see Chapter 1).

Collaboration within and amongst HEIs to seize interdisciplinary opportunities remain limited.

Throughout the region and internally amongst universities the division of university staff and students into different domains and study programmes/faculties hinders the fostering of diversity and heterogenic student teams and also research projects with complementary competencies. This is an interdisciplinary loss that can reduce the students’ exposure to and ability to engage in projects with other students that might contribute to the forming of interdisciplinary teams with members with complementary skills. The lack of focus on this area is partly due to the national policy framework in governance, funding and quality assurance, but also the lack of a strategic vision (see Chapter 5).

Moravia-Silesia and its HEIs have abundant potentials to foster inter-institutional and cross-disciplinary collaboration. The presence of many academic domains in the universities combined with the diverse structure of industry and business (ICT and other technical fields) provides a robust base

for innovation, as diversity and complementary competencies can trigger new solutions and make way for collaborative consortiums in new settings. The mix of HEIs including institutions of different age, culture, history and academic focus also allows for diverse approaches and significant potential for development in terms of blending domains and competencies in order to have a diverse basis for innovation and entrepreneurship.

Currently, Moravian-Silesian HEIs have only a few interdisciplinary programmes. VSB-TUO has two all university programmes (Mechatronics and Nanotechnology) but no interdisciplinary efforts between business and technology fields. In the Silesian University in Opava, cross-disciplinary and cross-institutional initiatives pose a challenge due to the campus organisation and the physical distance of the School of Business Administration in Karviná from the rest of the institution, based in Opava.

Recommendations

Focus entrepreneurship education activities on regional challenges and opportunities. Environmental management, pollution and health impacts, social cohesion, geriatrics and technical assistance to the aging population, clean mining, material research, family business management and entrepreneurship, industrial change and computer engineering are some of the areas where university could play a leading role. The HEIs should consider a focus on social entrepreneurship; in particular the Silesian University Faculty in Karvina, but also others. This would involve the hiring of educators or PhD candidates with this specialty. Social entrepreneurship could also be a focus for the VSS College for Social and Administrative Affairs in Havírov, whose origin has been in training medical professionals and social workers.

Build a long term robust focus on entrepreneurship and innovation by creating chairs in these fields, which develop related research, education and knowledge exchange and keep these activities updated through constant interaction and shared learning with international research community. Currently the HEIs in Moravia-Silesia lack adequate structures to develop entrepreneurial education and research, in particular professors in entrepreneurship or innovation. One way of moving this agenda would be through investing in dedicated chairs. VSB-TUO, if possible in collaboration with UO, could consider creating two endowed chairs and fill these positions through an open international competition. The focus areas of the chair in entrepreneurship could include: venture creation activities, development of entrepreneurship research and education programmes, contribution to the development of the business incubator. The focus areas of the chair in innovation could include: matching university research results with venture capital and entrepreneurs, developing the research agenda in innovation and technology commercialisation, contributing to the development of the science park and raising external funding from the EU and national sources to develop innovations from faculty inventions,. In order to build broad-based research competences in these fields, HEIs could develop a joint high profile internationally active doctoral programme in entrepreneurship and innovation for PhD students with international experience and/or background. Research and learning programmes should be continuously updated through constant interaction with the international research community in entrepreneurship education and research. International examples of universities which have systematically invested in entrepreneurship and innovation include Lund University.

Box 26. Lund University: traditional university shifts its focus (SE)

Lund University, founded 1666, is a prestigious research-intensive university which shifted its focus in the late 1990s, by developing a more systematic interest in entrepreneurship and innovation and created two endowed chairs, one in entrepreneurship and another in innovation. Key success factors in the Lund case have been sustainable funding and organisational support with the backing of the university leadership.

In the case of Ostrava, and in particular VSB-TUO, there is currently insufficient support for developing entrepreneurship education and entrepreneurship research at the highest academic level. While entrepreneurship and innovation is a part of the explicit school strategy, there are no dedicated research and teaching in entrepreneurship. The lack of such position makes it difficult to follow through with the strategic objective of the university.

In 2003 the university launched a research programme on innovation and entrepreneurship that later became the basis for the creation of the Centre for Innovation, Research, and Competence in the Learning Economy (CIRCLE). Today, CIRCLE employs around 40 researchers and is regarded as one of the leading research centres in entrepreneurship in Europe. Lund University's education provisions in entrepreneurship has grown from a handful courses in the early 2000s to over 25 courses in 2012 with a total of 538 students. Since the introduction, the two professors and their research teams have attracted well over Euro 20M in research funding and their units have produced over 100 peer reviewed journal articles in entrepreneurship and innovation.

Difficulties in implementing the initiative have been strong resistance towards new courses and research centres at different faculties of Lund University. For example, the entrepreneurship education is run with a base at the business school. It was and still is a problem of getting acceptance for these courses at other faculties. Still, with time and patience, these obstacles can be overcome. This is one reason why it is so important to have an enduring commitment from the university, as indicated by an endowed chair, to facilitate this change. The change cannot be achieved through short term projects.

Source : www.lu.se. Contact: Professor Björn Asheim, Circle; Professor Hans Landström, LUSEM.

Engage in pedagogical reform, revising and modernising the learning goals of courses. Despite the current challenges associated with the national accreditation system, the HEIs in Moravia-Silesia should prepare for a profound pedagogical reform. A concrete step forward would be the creation of a working group responsible for the pedagogical reform, with a mandate to benchmark with international good practice. New requirements should be initiated on course and programme plans which should have clear functional goals (skills and experiences) in addition to declarative goals (written tests). The course and programme plans should be constructively aligned with actual pedagogies. Student grading needs to be used to assess the degree of alignment with course goals, as well as management interest needs to be directed towards following up the functional goals of the education that is actually implemented in the classroom. This may require the development of new instructive pedagogies, and grading assignments. An example of a university that has taken concrete steps to develop synergies between teaching and learning activities with functional skills is Aalborg University.

Box 27. Aalborg fighting off periphery by co-locating in Copenhagen

Aalborg University Copenhagen (AAU-Cph) is an initiative aimed to increase synergies between the teaching and learning activities at Aalborg with the activities in Copenhagen, as Aalborg University functions as a network university with three campuses in Denmark (main campus in Aalborg, a campus in Esbjerg and a campus in Copenhagen). AAU-Cph has grown in four years from approx. 400 students to 4 000 students, and from 75 employees to approx. 550 researchers and administrative employees. The offering of cross-disciplinary programmes, problem and project based learning, group work and co-located companies and start-ups to deliver real-life cases, and synergy have had a significant saying in the high number of new students wanting to attend programmes at Aalborg University Copenhagen. Similar to the regional situation in the Czech republic, Denmark is highly concentrated in the sense of economic and political power. Most important decisions, the best infrastructure, tourism and most corporate headquarters are located in Copenhagen. Therefore, the AAU-Cph creates a lot of co-location and co-creation benefits.

Similar to Denmark, in the Czech Republic power, commerce and infrastructure is concentrated at the capital city. While time distance to commute between Ostrava and Prague takes only 3 hours, the mental distance between the capital and Ostrava seems to be quite long. Ostrava is not at the top of the mind of Prague located decision makers. Co-locating in Prague creates a possibility to be updated with the latest pedagogical

developments there, and facilitates the possibility for Ostrava to pursue an entrepreneurial university agenda.

A core objective is to increase synergies between the teaching and learning activities at AAU-Cph and the co-location and co-creation efforts. Several workshops have been organised with start-ups, students and incumbent firms, resulting in new projects, research thesis and student employment. Some of the more established companies are building on student projects and internships to go into joint research collaboration with the university. Also, collaboration amongst the tenant firms has increased. Even though the critical mass is still quite small for the new campus (16 companies and start-ups), initiatives, such as the Danish App Lab (DAL) and newly established Copenhagen Game Lab, are likely to boost the innovation environment. DAL was established by AAU, Microsoft and Nokia in November 2012 as a place for cross-disciplinary collaboration in App development. AAU has several initiatives in the area of gaming and uses these extensively for idea generation and gaming start-ups. This promoted the launch of Copenhagen Game Lab in September 2013 to investigate the multiple applications of gaming in teaching, research and business. Danish App Lab and Copenhagen Game Lab are both physically placed at AAU-Cph, but they function as “virtual labs” and make use of social media and streaming, video-mentoring, video-tech talks, to conceive and implement projects, and to involve actors from all over Denmark.

Source : https://heinnovate.eu/intranet/tef_guide/case_study.php?id=18#.UvVAf_lDXHo; Contact: Jakob Stolt (author of Chapter 5 in this report).

Increase student-centred learning through problem-based learning and flipped classroom models. HEIs that struggle with high dropout rates and reducing per-student funding need to find innovative ways to develop student-centred learning models. Amongst the possible models, one is to prerecord lectures and let students watch them on their own on school computers. Recorded classes save the staff time spent on preparation of lectures which can instead be used in workshops on the topic. Recorded lectures must be supported by regular integrated workshops and labs to audit that the knowledge is translated into practice. A second model is to engage students to grade other students. The teacher's task is to base the assessment on the student examiner's judgment, and on their own. This leads to more expedient grading and added learning opportunities for students. Grading must be evaluated and judged by the responsible examiner, and grading templates need to be extensive. Maastricht University provides an example of an institution that has focused on the development of student-centred learning models.

Box 28. Student centred learning at Maastricht University (NL)

Maastricht University is a research university that offers innovative academic learning programmes using methods of instruction that promote active learning to build knowledge and develop academic skills as well as an academic and professional attitude. These programmes aim at preparing students to participate in a globalising labour market. The students are invited to join a vibrant, multicultural and international academic community and to invest in their intellectual and personal growth. The main focus of the pedagogy is Problem-Based Learning in small groups and tutoring.

Interviews with students across the HEIs in MSK indicated a large power distance between teachers and students, as well as an emphasis on teaching rather than learning. To change this culture, the region may look to Maastricht University, to see examples of how learning could be put in the centre of education, and how the power distance between teachers and students can be reduced.

To reduce power distance between teachers and students can face several problems in the implementation. It may face opposition amongst teaching staff, who would have to change their didactics. It can also conflict somewhat with centrally determined learning goals. Students may be unused to take own responsibility for their learning, which is also a challenge.

To implement this initiative, care needs to be taken such that pedagogies are developed in order to assure that learning goals are achieved, and that staff is trained in new didactic formats. This type of instruction can be costly, but the basic premise, of making students take more own responsibility for learning and even teaching,

does not necessarily mean that it would need to cost more.

Source : www.maastrichtuniversity.nl/web/Main/Education/OurTakeOnEducation.htm

Consider the introduction of Massive Open Online Courses (MOOC) in order to make more efficient use of faculty time and to avoid pedagogical challenges of mass lecturing. Integrate massive open online courses into regular degree programmes using staff for group discussions and personalised mentoring. Begin by integrating massive open online courses into regular degree programmes in pilot programmes, for example in ICT and business in VSB-TUO or Silesian University of Opava, using staff for group discussions and personalised mentoring. Gradually introduce MOOC elements to degree programmes in more traditional faculties. Ideally faculty will soon become comfortable enough to produce fast online instructional content as a substitute of their traditional lectures. The advantage of online content is that students can repeat content as often as they want to (rather than just having one chance to listen to a lecture).

Mobilise students for enterprise and strategic development of the university by strengthening the role of student associations, by encouraging student volunteering and developing credit-bearing outreach activities. Student involvement is essential for developing a vibrant campus life and enterprising mind-set. Student association activities can develop students' entrepreneurial abilities and improve the on-campus services including student canteen and cafes, language development, study support and international exchange. Students can also conduct assignments in association with small and large firms. They can drive entrepreneurial change at the university as is the case with Aaltoes in Aalto University. Students can also help raise aspirations for higher education and raise interest in engineering and science studies amongst secondary level students. This could be combined with entrepreneurship education through assignments, where students need to develop and document their leadership challenges in leading a group of secondary level pupils as has been done in the First Lego League programme at Chalmers University of Technology. University support for this type of activities has an important symbolic value for students. Interviews with students in Moravia-Silesia indicate that the university could play a much more active and encouraging role to support-student led activities at campus.

Box 29. Aaltoes – students promoting entrepreneurship (FIN)

Aaltoes is the largest student-run entrepreneurship community in Europe. It was founded in 2009 by Aalto University students to boost new enterprises and help students to work on their own ideas. Aaltoes encourages high-tech, high-growth, scalable entrepreneurship with the aim to transform itself into a leading start-up ecosystem for Finland and Northern Europe.

The Aaltoes represent another example of how students can be used to a greater extent in the HEIs in the Moravia-Silesia region. The region has a large student-teacher ratio, which has as a consequence that properly utilized the student base is the greatest resource for impacting the region and initiating change at the university.

Aaltoes is currently run by 34 dedicated students and over 300 active members. Aaltoes runs its own business accelerator Start-up Sauna. The financial support from Aalto Centre for Entrepreneurship is multiplied by the energy and enthusiasm of students who now organize some of the most interesting entrepreneurship events in northern Europe such as the Slush start-up conference. Aaltoes is one the most cost efficient organisations for student entrepreneurship in the world.

The key challenge for this initiative is to maintain the stability of the student organization, as there is a need for constant succession as students reach graduation. Aalto University have recognizes the value of student community and supports it with significant finance. Instead of paying professional managers, student projects are

supported and encouraged and implemented to a large degree by voluntary student.

It would be relatively easy to implement this at HEIs in the Moravia-Silesia region. The main obstacle would be hesitations amongst faculty to give too much responsibility for “immature” students. There seems however to be enough competent, dedicated and eager students.

Source : <http://aaltoes.com/> Contact persons: Paula Kyrö, Steffen Farny

Box 30. First Lego League

First Lego League is a robotics programme for 9 to 16 year olds, which is designed to get children excited about science and technology – and teach them employment and life skills. This exercise in robotics programming and team work is an excellent way of increasing awareness of and interest in engineering topics amongst students at secondary schools and high schools.

This project is especially relevant for VSB-TUO. Participating schools can join an international community, with hundreds of thousands of pupils, 20 000 teams in more than 70 countries. Thanks to its international component, the First Lego League would be well suited for the schools in Ostrava and Moravia-Silesia because it provides an instrument to improve English skills. VSB-TUO and other HEIs could consider sending student teams to secondary schools as advisors and coaches to pupils. Learning objectives for students would be around learning and project management.

At Chalmers University of Technology, teams participating in First LEGO League are led by their teachers as well as engineering students from mechatronics and automation. While the pupils learn robotics design, the engineering students gain improved practical experience in team management. The university benefits from the PR value, while raises interest in engineering education.

An identified future problem in Moravia-Silesia is the recruitment of students from secondary schools to the university. Currently, staff members are engaged in marketing the university directly to secondary school students as part of their job. First LEGO league is an example of an assignment university students can do to practice their leadership skills, and at the same time promote engineering to secondary school students. This frees up resources from teaching staff, as well as exposes university students to a practical leadership assignment.

There are some costs associated with implementing this competition. Secondary schools do not necessarily have these funds, but some funding probably needs to be put aside to implement the initiative. There also need to be a progressive course, ideally in the field of mechanical engineering, where this exercise fits.

Source : www.firstlegoleague.org/

Facilitate student participation in research commercialisation through introducing a special master programme in entrepreneurship education. This would increase the HEIs third mission activities, enable them to play a leading role in the region’s economic restructuring and growth, create success stories, and ensure that the research developed at VSB-TUO comes into commercial use for the big public. Create large open spaces in the science park for co-creation and start-up purposes – free of charge.

Box 31. Students boosting research results at Chalmers School of Entrepreneurship (SE)

Chalmers School of Entrepreneurship is one of the leading institutions in science commercialisation in the Swedish and Nordic context. Chalmers has engaged students in the commercialisation process to speed it and to make scientific results available to a broader market of consumers. Their work is credit-bearing and integrated into a master’s level education on technology commercialisation or entrepreneurship, and can therefore be funded by the educational budget. This arrangement brings clear benefits for both students and the society: students

learn new industry relevant skills, while the society benefits new innovations and an accelerated rate of the process of commercialisation.

Interviews with representatives of Ostrava Science Park, indicates a lack of ability to convert scientific advances developed at the university into innovations and commercial success. In general, it is expensive, risky and complicated to facilitate commercialisation of science.

Chalmers School of Entrepreneurship offers a unique model for leveraging students in the commercialisation process to reduce risk and costs of commercialisation at the same time as it is offering a unique and attractive educational content. Some 50 companies have been developed by the school, which is a top figure amongst the technology-based incubators in Sweden and represents 25% of the total value of companies spun out of the 13 technology-based incubators.

This model is relevant to VSB-TUO, as a means to work around the constrained financing, lacking activity in the science park, and low level of utilization of students. Implementation of this model is challenging, and commercial success is uncertain. Therefore it is absolutely essential to see the educational and learning benefits of challenging students to commercialise science, as part of a longer educational program.

Source : www.entrepreneur.chalmers.se/ Contacts: Viktor Brunnegård, Mats Lundqvist

Develop students as innovation resource for local companies and place regional – large and small – employers at the heart of the HEIs' entrepreneurship education efforts by carefully balancing the current focus on large corporations towards new and small firms. Focus on the employability of students by increasing work-based learning opportunities, collaborative projects with the business, and design and deliver study programmes in order to improve the relevance and quality of learning programmes and graduate employability. A closer collaboration between HEIs and local businesses that draws on students as real resources for innovation and business development is a way of strengthening the students' ability to combine their theoretical knowledge with practical experience. At the same time, mobilising students to provide practical contribution to development of local firms will improve the HEIs' linkages with the surrounding small business community. These collaborations could be carried out as internships, student projects (with a strong focus on implementation and execution rather than only on analysis and reflection), student employees and innovation workshops. A useful example in this respect comes from Jönköping International Business School in Sweden.

Box 32. Host company work at Jönköping International Business School (JIBS) (SE)

JIBS has for the past 20 years mobilised its student population for business collaboration. Each student is allocated with one "host company", from year one at the university. Students receive practical problems and assignments from their host company. The problems are close related to their course programme at a specific point in time. Jönköping International Business School fulfils its third mission, helps improve students' employability skills and outcomes, gains input into its teaching and RDI and improves the relationships with the business environment. The business community benefits from a young, well-educated consultancy and the ability to pre-screen potential new employees.

The host company program is relevant to Moravia-Silesia, because it provides an additional arena for contacts between companies and students, within the education. This helps companies to get in contact with future employees at an early stage. By doing this the likelihood of companies employing students during, or after education will increase. On top of this, the students get valuable insights into practical problems in companies that they could relate to theoretical knowledge that they may obtain in the education.

JIBS has successfully leveraged the host company model for two decades, and faces no difficulties in companies signing up year after year. Host company work offers benefits for students, the Business School and the business community. Students acquire soft skills, close contacts with the potential employers in industry, public bodies and other organisations, ideas and suggestions for the thesis work and may find summer jobs,

internships or even longer term employment.

Challenges of implementing the host company project is to keep a significant number of host companies, enabling students to access important information about the company such they could do a good work, as well as assuring that students produce high quality reports and advice to the companies.

This project should be implemented at a small scale in the beginning to make sure that enough companies are enrolled in the project, and that enough teaching resources are made available to assure the quality of reports and advice.

Source : <http://hj.se/iibs/en/education/career-prospects/host-companies.html> Contact: Astrid Löfdahl; astrid.lofdahl@iibs.hj.se

Encourage interdisciplinary study programmes that cross the faculty boundaries and bring together different institutions and promote inter-HEI collaboration around entrepreneurship education. Interaction between engineers and entrepreneurs is central for the development of a high tech, high salary jobs in the region. VSB-TUO offers the modern facilities of the incubator and a concentration of excellent faculty and engineers, but lacks entrepreneurs who are trained according to the latest entrepreneurial theories. Ostrava Business School trains entrepreneurs based on the latest entrepreneurial theories, but lacks technological understanding and research connections. Bringing the OBS and VSB-TUO students together could create high potential new ventures.

Introduce greater flexibility by adding more optional courses in study programmes. Public higher education institutions should, ideally, enable students to be able to pick and choose at least 25% of the courses, within any faculty or department of the university. This would create competitive pressures towards faculty to produce pedagogically appealing and relevant courses. Monitor new department interactions and collaborations and their importance from the student perspective. The current programme accreditation regulations should not be used as an excuse for limited pedagogical development and interdisciplinary collaboration.

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CHAPTER 4 START-UP SUPPORT

Jakob Stolt

HEIs across Europe are increasingly seen not only as education and research institutions, but as hatcheries and incubators of new knowledge-based ventures. To meet these expectations, HEIs will need to develop start-up support structures and mechanisms. This chapter examines the current framework in Moravia-Silesia for start-up support in and around higher education institutions. It concludes with recommendations to improve entrepreneurship support in the region, highlighting international good practice.

Introduction

During the last decade, the presence of entrepreneurship in higher education increased all over Europe. This is "*based upon a view that the role of entrepreneurship in society [...] provides an opportunity for individuals and organisations of all kinds and in all walks of life to cope with, provoke, and perhaps enjoy, an increasingly complex and uncertain world*" (Gibb, 2005, p. 3). Promoting entrepreneurship – understood in a broad sense as initiative taking, creativity, imagination, innovation, organisational entrepreneurship (intrapreneurship), social entrepreneurship, etc., and the related competences (attitudes, skills and knowledge) – has been reflected in new education activities (see Chapter 2) as well as in a range of hands-on support measures to help those with a concrete business idea to starting-up a new venture.

From an initial focus on entrepreneurship education, over the last years the attention of HEIs and public policy has moved on to targeted efforts in infrastructure development and the provision of start-up support services, promoting, in this way, also the role of the university as a “full service provider”. This implies close interaction and co-operation with private and public support providers outside the HEI. Establishing a well-functioning interface requires a partnership framework that defines the roles of the different stakeholders and a tailoring of external support services to the particular needs of academic entrepreneurs in order to offer the right quantity and quality of support. This has also led to the creation of partnerships, co-operations and (temporary) organisations in creating a more holistic approach to promoting entrepreneurship.

Academic entrepreneurship rates in Europe are increasing. Starting-up a business during studies or right after graduation is, however, not yet a common practice and start-up rates amongst researchers are low. Providing business start-up support within or in close proximity to higher education institutions is therefore not to be considered as a quick remedy to increase the number of new firms, but as a long-term investment that provides assisted opportunities to “experience” what starting up and running a business means in reality (see Allen, 2010; Binks, 2005 and Gibb, 2005). It is also about building role models of entrepreneurial students, staff and alumni, and about encouraging those people with first-hand experience as entrepreneurs or substantial understanding of what it takes to run a business, to act as ambassadors and mentors for academic start-ups.

Students participating in entrepreneurship education activities are often considering undertaking the additional step of starting-up a business, especially if support structures and services are available.

In response to this, the European Commission (2008) stressed the need to support entrepreneurship as part of a broader entrepreneurial programme to ensure high visibility of the university's entrepreneurial commitment. *"A high visibility of the "entrepreneurial commitment" of an institution is achieved through the presence of dedicated spaces, such as "hatcheries" or incubators, and through support for students' start-up plans"* (European Commission, 2008). The availability and presence of tools, systems, human resources, and other facilities (such as premises and labs) are a necessity for development. The motivation of students, the support from faculty and the exposure of such drive and enthusiasm towards (local and regional) businesses and society, are key enablers for HEIs to become hatcheries for new innovative ventures with growth potentials.

Successful efforts to develop competencies (attitudes, skills and knowledge) for entrepreneurship are housed in education as well as in the latter's social, economic and business environments. Effectively linking these requires a confluent interface, which provides opportunities to learn and practice. The development of such an interface involves long-term efforts. Key elements to ensure appropriate start-up support in higher education, especially in non-business studies, include: i) a policy to promote entrepreneurship in scientific labs; ii) a good institutional policy in terms of intellectual property rights; iii) dedicated and supportive incubators, or easy access to external incubators; iv) favourable business environment to ensure that incubators can create strong links with the business and financial community; and v) financial grants to support the entrepreneur, and/or access to other financial resources (EC, 2008). HEIs need to engage closely with the alumni who can act as mentors and offer access to established companies; they need to forge linkages with local businesses to reap the benefits of guest lecturing, project work, internships and access to real-life cases, and interaction with student start-ups; they need to open their campus to banks, business angels and venture capital (OECD, 2010).

Especially in local economies, which host more than one higher education institutions, economies-of-scale effects can matter for the result of entrepreneurship support offered by HEIs. Certain start-up support services, such as investment brokerage and incubation show greater results if offered to a major number of students and researchers and are likely to be less effective if organised individually by the higher education institutions.

There are wide opportunities as well as key obstacles for Moravia-Silesia related to start-up support within and in proximity of higher education institutions. Key opportunities arise from the presence of various cluster initiatives and development challenges resulting from the former focus on heavy industry (job and skills profiles, environmental stress), outward migration and an elevated level of long-term unemployed. These provide a very fertile ground for business ideas, of which many are likely to head towards high positive social impacts. At the same time, several key obstacles need to be overcome when establishing a holistic system for entrepreneurship support in Moravia-Silesia. Most pressing are the lack of coordinated efforts to use students as an innovation resource for the local industry, low interest and weak support from faculty members, the lack of visible role models of entrepreneurs in HEIs (however, many professors and researchers have/had second careers outside their HEI), and the lack of fundamental business support.

More focused and coordinated efforts to support start-ups in higher education – involving all key stakeholders – will hopefully underpin the overall ambitions of sustaining a technological and knowledge-based transition of the regional economy. Since resources (financial, human, physical and technological) are still scarce – given also the newness of entrepreneurship support efforts in HEIs in the region – collaboration of HEIs within proximity of both distance and entrepreneurial ambitions is likely to increase the outcomes for would-be entrepreneurs and start-ups. This chapter will discuss in the following how these opportunities can be acted upon and how the obstacles can be overcome.

Findings

There is a growing awareness of innovation and entrepreneurship potentials in the region.

In Moravia-Silesia, there is a general awareness of the (unutilised) innovation potentials, and the local governments, the Regional Development Agency, the Chamber of Commerce, and the Moravian-Silesian Employment Pact, all recognise the importance of innovation and entrepreneurship for a different, more knowledge-based, development path of the region. While a general tendency to disclaim responsibility of what to do and how to do it was noted during the OECD study visit, the HEIs in the region are considered (some more than others) important players in the transition towards a more knowledge-based economy. Some universities, most notably the VSB-TUO and the Business School of Ostrava, have developed elements of a start-up support system, which provides the basis for further development.

The regional economy and the diverse clusters open opportunities for collaborative efforts.

The presence of a diverse set of industry clusters opens opportunities for more co-ordinated and targeted collaboration and the involvement of all stakeholders in the definition of key development priorities, which, in the long run, will determine the choice of key areas of education and research. At the same time technical and ICT-based companies show a relatively robust growth in the region. In 2012, these companies employed 2.8% of the working population and the region ranks fourth in the country in the number of IT professionals. These businesses constantly search for highly skilled employees. Taking these developments into account can help determining where HEIs should focus their entrepreneurship support efforts.

An increased focus on social entrepreneurship and family business to address regional challenges.

The regional economy, in its current stage of restructuring and transformation, offers clear potentials to promote social entrepreneurship, with (at least) a triple impact:

- Social entrepreneurship can offer a comprehensive approach to entrepreneurship amongst a socially oriented youth.
- Social enterprises create jobs and offers role models for other types of enterprising behaviour.
- Social entrepreneurs and social enterprises can contribute to solutions for some of the social and demographic challenges that the region is struggling with.

Social entrepreneurship opens opportunities to all HEIs in Moravia-Silesia, also those which lack technological fields, including the University of Ostrava, the Silesian University in Opava and the College of Social and Administrative Affairs in Havířov, which could drive this agenda given their close collaboration with local municipalities. Social Entrepreneurship is new to the Czech Republic with no more than 2-3 years of academic attention and a consensus of the national definition of a social entrepreneur has not yet been reached.

Another focus, for the region, and the Czech Republic in general, is the attention on family business and succession management of companies established in the early 1990s. Implementing business succession in family firms requires special techniques and communication, maintaining an entrepreneurial spirit across generations of family leaders. The leadership change must be made when both junior and senior generations are ready for their respective roles of handing and taking over the firm's leadership (Hoy and Scharma, 2010). Professional education and higher education can both

play an important role in this. The Silesian University in Opava, School of Business Administration of Karvina, is already running a course on this.

MSK lacks coordinated efforts to use students as an innovation resource for local industry.

A closer HEI-business collaboration is likely to strengthen the willingness and ability of students to combine their theoretical knowledge with practical experience. Companies in Moravia-Silesia that make use of students as interns consider, in general, students as contributing real value-added to their business activities. For example, a recent survey of the Chamber of Commerce of Moravia-Silesia showed that 80% of the companies who had worked with interns from the VSB-TUO were satisfied this experience and many of these companies considered subsequent or later employment of their former interns.

These positive experiences are, however, not systematically acted upon. Currently there are no coordinated efforts to promote students as an innovation resource for local businesses. Master's and PhD students have a sufficiently high level of knowledge and competencies that allow them to be part of the companies' daily work and development. These collaborations could be carried out as internships, student projects (with a strong focus on implementation and execution rather than only analysis and reflection), student employees and innovation workshops. Regionally-based clusters could provide a platform for joint efforts amongst HEIs, public and private stakeholders. In practice, student work-based learning opportunities could be achieved through a targeted campaign to encourage the regional clusters and companies to take up more university interns and by including internships – on a broad basis – as a mandatory part of undergraduate and graduate curricula.

Faculty support for student entrepreneurship is at early stages of development.

Academic and administrative staff of HEIs can act as ambassadors for student start-up and support, especially if they have first-hand experience as entrepreneurs or substantial understanding of what it takes to run a business. Currently, faculty support is most developed at the Business School of Ostrava and at the Silesian University in Opava, School of Business Administration of Karviná, where researchers and educators engage in both formalised and more sporadic start-up support for students. Representatives from the Department of Business Administration, Faculty of Economics at VSB-TUO, emphasised that “entrepreneurship” in their courses has a strong emphasis on “opportunity seeking and finding resources to exploiting”, but that an overall strategy of how to build individual efforts into a holistic and easily accessible support ecosystem was missing.

More visibility for student start-ups.

Starting one's own company or taking over an existing firm are sufficiently exposed as career options to students – neither in study programmes, nor by HEI leadership or faculty members. Developing the entrepreneurial mind-set does not seem to play an important role in the elaboration and delivery of educational programmes, or collaboration between organisations that (should) provide start-up support together with the HEIs. While this is partly due to the current inflexibilities of the accreditation and governance systems (see Chapter 5), it also reflects the general lack of focus on entrepreneurship, not only in higher education but also in regional development actors.

Student start-ups in Moravia-Silesia have not (yet) achieved the critical mass that would allow them and their HEIs to take either advantage of the European wide growing trend of entrepreneurship promotion in higher education or having the possibilities to form coalitions that would qualify them for more public support and guidance. There is a lack of visible student start-ups that could provide role models for other students. The few student start-ups existing are more engaged in their business

development than taking on the role as models, and the HEIs are in early stages of developing mechanisms to reward and showcase these examples.

Enhancing fundamental business support provision in and around HEIs.

Exposure, support and early incubation can and should be provided in and around HEIs. There is not enough fundamental start-up support throughout the region with exception of isolated initiatives that lack impact and sustainability. The HEIs lack prioritised or coordinated structures for exposure, support and early incubation of student start-ups apart from some exceptions in the region. Some universities, most notably the Ostrava Business School and VSB-TUO, have developed elements of student start-up support; both have incubation facilities. Also, efforts are underway at the Silesian University in Opava and its School of Business Administration in Karviná. On their own these initiatives, however, lack critical mass, quantity and quality, and sustainability.

There are promising efforts to address this, such as, for example, the co-ownership of Ostrava University, VSB-TUO and the Silesian University in Opava of the Ostrava Science and Technological Park. The limited activity of the Park is, however, a concern. With vacant office space it could be tempting to take a market-oriented decision to accept any paying customer. It is, however, important to maintain the scientific part; otherwise the park will run a risk of degrading into a business park. The key idea of the close proximity of the science park and the VSB-TUO is to ensure that the Science and Technology Park will benefit from access to high quality labour and to the latest research.

Box 33. Promising start-up support initiatives in Moravia-Silesia

Entrepreneurship Incubator at VSB-TUO and the Green Light Accelerator Programme

The VSB-TUO Entrepreneurship Incubator runs an Incubation Programme for start-ups and offers other activities and schemes aimed at entrepreneurs, such as Apple Juice Meetings (informal meetings attended by current and future entrepreneurs) as well as motivational workshops and seminars. The VSB-TUO (jointly with CPI-Innovation Support Centre and the University of Ostrava) runs also the Green Light Business Accelerator, which directly targets students. The Accelerator supports any student who is self-motivated to start his/her own business. Students have access to business support services focusing on marketing, legal support and intellectual property issues such as patent applications. They also have the possibility to compete in the Green Light Start Up Show. The winner of the start-up show is awarded EUR 6 000-7 000 and a free location in the incubator for one year. The programme has a relatively short duration of two months, and it is unclear to what extent office services and office space are included in the offer. Currently approximately 60 ideas have gone through the Green Light programme. The programme has developed international partnerships, such as, for example, with Start-up AU in Tel-Aviv. This collaboration is seen as promising as Israeli start-ups are successful in accessing Russian and Asian markets. Occasionally also business students from the Silesian University in Opava participate in Green Light. The well-established business accelerator could be developed into Moravia-Silesia springboard for entrepreneurs from all HEIs.

The focus on entrepreneurship at Ostrava Business School

The Ostrava Business School has several initiatives that nurture enterprising behaviours amongst students. OBS encourages the entrepreneurial spirit and start-up creation through diverse means and mechanisms such as progressive pedagogy, business experienced educators, internships, mandatory idea generation, professional coaching for the business plan, weekly presentations by entrepreneurs and the physical incubator which encourages students to start their own business during study. OBS also rewards start-up activities: Students who have proved qualified in starting up a business receive the “Professional Diploma”, while those who keep their business alive two years after graduation receive the “Best Diploma”.

Ostrava Science & Technology Park

One of the important players in the MSK entrepreneurship support is the Ostrava Science & Technology Park. The founders and co-owners of the Park are the City of Ostrava, the Ostrava Regional Development

Agency Ltd., VSB-TUO, Ostrava University, and Silesian University Opava. The Park is an example of joint regional collaboration for specialised entrepreneurship support. While the science and technology park follows best practises for incubators and science parks, it currently has only limited activity.

The Regional Innovation Strategy 2010-2020 launched in 2013 a specific programme to support business start-ups which are located in regional business incubators and technological parks. The programme covers up-to 50% of investment and running business costs for newly established tenant companies. This is a promising initiative. At present there seem to be, however, no support measures for those new firms that are not located in the above mentioned premises, which means that a high number of new businesses and companies wanting to grow/expand do not have formal access to support and guidance in a formalised manner.

Furthermore, there is a lack of local, regional or national schemes that provide fundamental seed money for start-ups. Also lacking is non-financial support, such as help and/or guidance regarding legal aspects, proof-of-concept, sales, forming of teams, access to networks etc. These services are offered only for tenant firms in the regional business incubators and technological parks.

Recommendations

Unfold the innovation potential of the region and involve students. The key regional stakeholders should collaborate to strengthen the university-business links, for example, increasing internships opportunities and their take-up, utilisation of innovation vouchers, and expose students to and involve them in the real-life challenges of local companies. Greater publicity should be given to the performance of Moravia-Silesia in the national contest “Innovative Companies of the Region”, where recently twice winners came for the region, also to create a more conducive environment for innovative young firms in Moravia-Silesia.

Encourage social entrepreneurship. Social entrepreneurship can be a lever for promotion of entrepreneurship. Social challenges and change tend to have the youth’s attention. It is often easier for many students to identify themselves as social entrepreneurs or change agents in a local setting than as “big time” entrepreneurs, creating the next million-dollar-winning product or service. Municipalities, local and regional governments could regularly open a "Call for Social Solutions", involving a wide range of stakeholders, in search of innovative, bottom-up solutions some of the region’s key challenges. Combined with a greater focus on soft skills, social entrepreneurship can create awareness of, and interest in entrepreneurship and enterprising behaviour, while at the same time contributing to social change and local development. One way of implementing a social entrepreneurship project in higher education is replacing traditional exams by an enterprise project in the social sector, such as, for example, organising a charity event.

Box 34. Organising a charity event instead of sitting an exam at Dublin Institute of Technology (IE)

A DIT degree programme offers an opportunity for students to organise a charity event instead of sitting an exam. Students, who organise themselves into groups of three, need to accomplish ten key tasks, covering every aspect of event organisation during a three month period: 1) identification of a charity that they wish to support; 2) generation and selection of an idea for the charity event; 3) securing a suitable venue; 4) finding sponsors for the event; 5) development and implementation of a marketing strategy; 6) selling of tickets for the event; 7) organisation of every element of the operations; 8) budget determination for the event and management of the finances; 9) evaluation of the success of the event; and 10) writing of an individual report on the learning experience.

The DIT initiative has provide several results so far:

- Students appreciate the opportunity to help people and the fact that entrepreneurial skills can be used to help the community
- Students report enhanced learning outcomes and generally appreciate the opportunity to engage in an real life project
- Student demand for and interest in the course has increased significantly each year since its inception.

Some difficulties were found to implement the initiative. It took the faculty members involved in developing this course two years to persuade management that this form of assessment was worth doing, particularly given that the course was “entrepreneurship”. The hardest thing was to get the exam approved as being the whole planning and running of the event combined with a written report. Finally the management agreed to try it out

Two key aspects should be taken into account when implementing the initiative in Moravia-Silesia:

- Joining forces with public entities as to address relevant areas as targets for possible attention within the society, but make sure that the students in the end choose by themselves what areas to work with.
- Agreement amongst faculty on how to assess and evaluate the obtained competencies and skills in social entrepreneurship courses/activities.

Contact: Thomas Cooney, thomas.cooney@dit.ie Dublin Institute of Technology (DIT)

Source: http://ec.europa.eu/enterprise/newsroom/cf/itemdetail.cfm?item_id=3366

Increase the attention on business development and succession issues for family businesses. Family businesses that emerged after the revolution have contributed to entrepreneurial drive in Moravia-Silesia. HEIs in the region should develop courses – ideally in collaboration with the Regional Development Agency Ostrava and the Chamber of Commerce – that focus on the regeneration and succession of family businesses.

Box 35. Education programmes and online resources for family businesses

Four internationally renowned higher education institutions – IMD, INSEAD, Kennesaw State University and Harvard University – offer diverse education and training programmes on family business. Their experience, approaches to curriculum, resource material and contact persons can serve as inspiration for the development of similar courses in Moravia-Silesia.

- The IMD Leading the Family Business (LFB) programme is targeted at members of a business-owning family or non-family executives. LFB is offered in two formats, a four day stand-alone LFB programme and a six day Orchestrating Winning Performance programme.
- INSEAD’s Family Enterprise Challenge programme helps individuals to learn and understand their specific family business issues and management strategies.
- Cox Family Enterprise Center is a dedicated institute for family businesses related to executive courses and research. It offers executive MBA programmes for family businesses. Cox Family Enterprise Center MBA was rated the best in the US by CEO Magazine’s Global MBA ranking.
- Harvard Business School’s Family Business Educational Program is offered exclusively for business family members and non-family managers of family businesses. The Families in business: Generation to Generation programme is a six-day programme offering detailed insight into issues and challenges.

The programme provides families with a practical hands-on learning experience.

These programmes are presented at The Trusted Family website, an online platform that enables family businesses to organise information and training related to business development and succession. A highly secure intranet tool protects the family's privacy while allowing affluent and influential individuals to improve the social cohesion of the cluster they belong to.

Source : www.trustedfamily.net/about/; <http://www.trustedfamily.net/2011/02/07/the-best-family-business-education-programs/>

Promote Erasmus for Young Entrepreneurs. Erasmus for Young Entrepreneurs is a cross-border exchange programme, which gives new or aspiring entrepreneurs the chance to learn for a couple of months from experienced entrepreneurs running small businesses in other participating countries. The programme has been designed to offer strong added value to business of both new and experienced entrepreneurs. Possible benefits include: exchange of knowledge and experience, networking opportunities across Europe, new commercial relations or markets abroad. Since programme start in 2009, around 2 000 successful relationships have taken place, the number of Czech new or host entrepreneurs, however, remained low. Erasmus for Young Entrepreneurs could be a relevant initiative for cluster firms in Moravia-Silesia, it could be organised as part of the RIS3 strategy. The Innovation Support Centre at VSB-TUO (CPI) could play a leading role in this. The involvement of students, from a very early stage on, will be important. An inspiring practice is Gate to Create in Denmark, a national student entrepreneurship organisation that includes the eight Danish universities.

Develop an easily accessible system of fundamental business start-up support. The present system of business support does not provide specific and tailored support for academic start-ups. There are no easy access points, except for the business incubators at the VSB-TUO and the Ostrava Business School. It is not clear whether these are also open for students and researchers from the other HEIs in the region. Fundamental start-up support is crucial for the initial exploitation and development of entrepreneurial behaviour in any geographical or structural set-up. Innovation and entrepreneurship centres, science parks, and incubation facilities are suitable locations for the provision of such support. Important is that a local system involves all organisations and provides easy access for would-be-entrepreneurs. When start-up support is shared and delivered in multiple locations, the region can optimise the use of common resources, while not taking up too many resources from the involved stakeholders. On the other hand, if would-be-entrepreneurs do not know what to do or where to go, the motivation can soon be destroyed, as the way to get things going seems hopelessly long and burdensome. A successful example of specific support for academic start-ups is the Copenhagen School of Entrepreneurship. The involvement of students, from a very early stage on, will be important, too. An inspiring practice is Gate to Create in Denmark, a national student entrepreneurship organisation that includes the eight Danish universities.

Box 36. Copenhagen School of Entrepreneurship, CSE (DK)

Copenhagen School of Entrepreneurship (CSE) is a part of Copenhagen Business School. CSE develops practical, diversified and knowledge-based entrepreneurship through collaboration with students, teachers, researchers and the corporate sector. CSE offers fundamental start-up support for students and works in close collaboration with other support schemes so that all students – including those in the student incubator or others who just drop by – can access a wide range of support.

Ostrava needs joint action and efforts within the area. Even though CSE initially was founded at one institution (Copenhagen Business School), students from many other HEIs in the Copenhagen area use the premises and attend events and activities arranged by and taking place at CSE

Amongst the achievements of the initiative to date are:

- More than 150 students companies started since 2007
- Weekly events attracting between 50-100 attendees every time
- Gone from student-bottom-up activity to recognition and financial support from university management and participation by faculty
- Ranking on almost equal terms with professional science parks and incubators
- Has had substantial influence and effect on entrepreneurship awareness amongst HEIs in Denmark

One of the main challenges for implementing an initiative like this is getting organisational and financial back-up. CSE were initially developed and put together by different organisations engaged in entrepreneurship, but all supported by external funding. The successes and targeted communication of the achievements and interaction with relevant stakeholders eventually came to the management's attention, and thus a joint application with two other universities in the region made way for substantial funding by the European Social and Regional funds.

One of the keys to success of CSE is its truly inter-disciplinary nature. So any similar initiative has to ensure participation from as many relevant academic domains and institutions as possible. The physical premises can be multiple amongst the participating universities so that the overall brand (name) is merely "virtual" and not bound to one physical place. Taking turns in arranging events and being host for initiatives could secure cross-campus ownership.

Source : <http://cse.cbs.dk/>

Box 37. Gate to Create – the power of entrepreneurial student organisations in Denmark

Gate to Create is the national student entrepreneurship organisation in Denmark that aims to strengthen entrepreneurship at Danish universities starting from the student perspective. Gate to Create was initiated in the spring of 2010 by four different student entrepreneurship associations. Since then the Gate to Create has grown to nine member associations, which operate in Denmark's eight universities. Gate to Create is a volunteer student-driven NGO that works with Entrepreneurship at Danish Universities. The members are local student-driven networks and societies in Universities – all focusing on Entrepreneurship. These networks and societies work through Gate to Create by establishing and maintaining contact across universities, gathering and distributing knowledge and developing new best practices. Gate to Create works as a gateway to the rest of the entrepreneurial ecosystem.

The initiative is of interest for MSK since trying to create a common platform/arena for entrepreneurship interested students could help creating the critical mass of students that is often insufficient at one single institution; it helps create common awareness, the possibility of creating joint funding applications instead of competing for the same money and develop inter-disciplinary contacts and networks that are drivers for innovation.

The biggest achievement of this initiative is the invaluable network that is created amongst students from different disciplines, universities and even different parts of the country.

As students (naturally) only are enrolled for a limited period of time, the initial negotiations and talks of how and why to create such a thing took years, because there were almost constant changes in the people taking part in the development. Also the fact that the participating organizations still were under definition and construction, made it hard to find common ground.

The success of Gate to Create resides in that it is a bottom-up initiative. Universities should support student organizations with access to premises, some basic resources (funding) and visible and formulated support, but

the agenda has to be the students' own.

Source : <http://gatetocreate.dk/>; info@gatetocreate.dk

Enhance commercialisation of research through start-up efforts. The energy spent on technology transfer efforts at universities worldwide seems to have far less effect than the resources put into support for business start-up and early development. International experience shows that the effort used on intellectual property rights (IPR) and licensing does not in the long run provide sufficient outcome and financial output that justifies the attention given on them. Greater emphasis should be given on the commercialisation possibilities and establishing of start-ups and spin-outs, as these are the real value-makers and job creators in the short and the long run. The support should ideally be offered in collaboration with, and physically located in the incubators facilities and science parks, with regular activities, such as technology scouting events, taking place at HEIs, and in collaboration with the industry clusters in the region. Specialised support demands personnel with special skills, knowledge and contacts. It will be important to focus as well on the (initial) commercialisation of research and on IPR and licences, rather than overly focusing on the latter.

Increase accessibility and effectiveness of incubation services. Incubation facilities in the region should be open to students, researchers and alumni, who would like to start-up a business, regardless of their HEI affiliation. Enable the incubator to offer office space (for example in the vacant space in the Science Park), and run large-scale market campaigns to raise interest in locating in the incubator. Consider providing student associations with funding incentives to scale up the incubator work and reach out to larger numbers of potential tenants. One possibility could be to have student-run canteen or café services. Useful information on how to set up successful innovation-based incubators and start up support can be found in the “Smart Guide to Innovation-Based Incubators” and the included case studies (EC, 1010)²⁴. The EC Smart Guide aim is to provide local stakeholders of a region an insight on the scopes of Innovation-Based Incubators and on the paths and steps needed to set up successful incubators and start-up support. Part 1 provides useful information and advice on how to create successful Innovation-Based Incubators, covering the necessary conditions, partnerships and services. It also provides information on the cost structures of the operations and the measurement of the targets. Part 2 describes case studies in Europe and beyond. The Smart Guide is an extremely well-documented and easy-to-apply guide of how to set up (and develop) an incubator. Even though the existing incubators of MSK are on their way and well established, the guide offers many insights and tips of how to move forward. Elements of the guide can also be used at the single institutions when setting up minor initiatives and local-based incubators with a smaller and more campus-specific focus. The case study part offers insight into established incubators, including contact details that are valuable for further inquisition as some of the incubators may mirror the ones in Ostrava thus giving way for dialogue.

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CHAPTER 5

NATIONAL HIGHER EDUCATION POLICY FRAMEWORK AND INSTITUTIONAL-LEVEL EFFECTS

Jaana Puukka

This chapter examines the national policies and their impact on the performance of the higher education institutions in Moravia-Silesia. It highlights where these policies and practices could be improved in order to drive internationally competitive and entrepreneurial institutions. Drawing from examples in other OECD countries, the chapter concludes with policy recommendations for national, regional and local governments, and higher education institutions.

Introduction

The economic crisis, long term demographic change and competition from emerging economies require a socio-economic transformation in Moravia-Silesia with greater emphasis on knowledge, new enterprise and access to relevant skills. The rapid expansion in higher education student enrolments has now levelled off, and the HEIs need to diversify their funding streams by building their R&D capabilities and stronger linkages with the local industry. While investments from the European Structural Funds have made possible significant improvements in Moravia-Silesia and its higher education sector, and while the European funds will continue to flow in the new programming period from 2014 to 2020, Moravia-Silesia and its higher education institutions will need a more strategic innovation and entrepreneurship orientated approach, including better connections between the higher education system and the local economy and stronger focus to the quality and relevance of education and RDI activities.

The Czech Government has in recent years embarked on a number of initiatives to reform the higher education system, but so far profound changes have not yet been made. This chapter examines to what extent the current policy framework facilitates the development of internationally competitive HEIs which are responsive to the industry needs, deliver relevant skills and have the capacity to lead the new business formation and contribute to the restructuring of the local economy. It highlights many of the issues identified by the OECD Review of Tertiary Education (OECD, 2009) and where appropriate updates this information. It examines whether the current higher education system, particularly governance, funding and quality assurance mechanisms, are sufficiently robust to modernise the governance and management of higher education institutions. In this context, this chapter examines the following questions:

- Do the current policies support and incentivise industry collaboration, local engagement and entrepreneurship of universities in Moravia-Silesia?
- Are the existing funding, governance and co-ordination mechanisms effective and do they help higher education institutions play their regional role?
- What lessons can be learnt from international experience?

The chapter concludes with recommendations emphasising the need to continue the higher education reform by carefully engaging with the HE sector and the key stakeholders. It will be

important to ensure that the changes will drive more entrepreneurial HEIs which play an important role in the local and regional development and at the same time improve the quality, relevance and international prestige of the universities.

Findings

Leadership and governance

A lack of external influence in governance encourages supply-driven education and research.

Public universities in Moravia-Silesia as elsewhere in the Czech Republic have robust academic self-governance with a low level of direct involvement of stakeholders outside the academia. The Academic Senate with elected staff and students decides on all important matters.^{25,26} While the inclusion of external members forms an important part of autonomous universities' accountability towards stakeholders and society at large, the Czech higher education act does not require stakeholder involvement in the Academic Senate. The establishment of the Boards of Trustees has introduced external stakeholders into the university governance but – apart from their role in real estate transactions – they play only a limited advisory role in the public universities.

In governance models which give limited influence to external stakeholders, universities' third mission role and entrepreneurial activities are often weakly developed. The choice of the study programmes and their contents are more likely to be supply-driven rather than reflecting the demands of the labour market. Industry involvement in curriculum design and implementation, educational processes or research activities is also limited. In Czech HE, these tendencies are strengthened by the academically-driven Accreditation Commission with no external members from the labour market. (See below for details).

Decentralised institutional governance reduces the ability to launch HEI-wide reforms and contributes to the under-resourcing of central and horizontal activities.

The Rectors have the formal responsibility for their universities, but their ability to exercise effective leadership is limited. The strong position of the Academic Senate is underlined by the regulations for the Rector's appointment and dismissal.²⁷ The Rector can be dismissed by the President of the Czech Republic on the basis of the proposal of the university academic senate. The Rector's term of office, four years, is determined by law and renewable once.

The system is characterised by limited institutional capacity in strategic decision making, challenges in the prioritisation of activities and a general difficulty in creating financial headroom for new strategic openings. Important functions remain under-resourced or are at early stages of development, often boosted by external funds, particularly from the European Union.

²⁵ The Academic Senate approves the budget and monitors the financial management of the institution, the strategic plan, annual reports on the activities and financial management of the HEI, and the evaluation of its activities. It decides on the establishing, merging, splitting or dissolving constituent parts of the institution, and approves all internal regulations of the HEI and its parts.

²⁶ Students form at least one-third and at most one-half of the Academic Senate membership.

²⁷ The Rector is appointed and dismissed by the Czech President following the proposal of the Academic Senate based on secret ballot and subject to HEIs' internal regulations.

In the decentralised institutional governance system individual faculties and departments are relatively autonomous in relation to the university centre.²⁸ In order for the decentralised matrix organisation to function well in HEIs and to boost their entrepreneurial activities, each component of the institution would need to be complicit in its role and responsibilities within the whole. While this system can incentivise entrepreneurial activities at the individual and faculty level, it can also reduce the ability to pursue and implement university-wide reforms or develop new interdisciplinary programmes because independent faculties may be less inclined to consider inter-faculty co-operation or the functioning of the university as a whole.²⁹ Similarly the decentralised institutional governance systems also contribute to the lack of strategic collaboration between HEIs which leads to duplication of efforts and sub-optimal use of public resources.

Currently the public HEIs in Moravia-Silesia are each at early stages of developing internal processes capable of knitting the different strategic agendas together, and the progress in developing important central services and functions remains uneven (Box 6.1). While the situation varies from one institution to another, typically under-resourced functions and services include: students' career centres, knowledge transfer and industry collaboration, entrepreneurship support, support for language learning and internationalisation, student's academic and social support, quality assurance and support for quality teaching, new modes of learning, and lifelong learning. As noted earlier, collaborative efforts remain limited amongst public institutions and between the public and private HEIs.

.Box 6.1. Strategic openings of the MSK HEIs

The current Rector of the **VSB-TUO** has a strong backing of the academic senate and is overhauling the VSB-TUO research infrastructure with a EUR 200 million investment from the EU. The university is building its R&D effort to balance the ongoing national changes and alterations in the level per-student funding. VSB-TUO is expanding its R&D effort to fields that require multidisciplinary expertise such as clean mining or integrated safety systems. Its focus on inter-operability between traditional areas and new technologies provides competitive advantages for regional smart specialisation. By matching mining, metallurgy, mechanical and material engineering with supercomputing, nanotechnology and ecology VSB-TUO aims to provide a leadership role in the economic and industrial restructuring of Moravia-Silesia. Despite strong support for the rector, there are currently no attempts to merge faculties or programmes which would probably come to a halt in the academic senate. VSB-TUO has significant potential to boost interdisciplinary learning by bringing together the seven faculties that span the fields of engineering, technology and business. Currently VSB-TUO has two interdisciplinary "all-university programmes" across faculty borders, but none that would bring together business and technology, reflecting the difficulties in making changes in the current decentralised governance system. Key central services for knowledge transfer and student employability have been established, but are either poorly resourced or rely entirely on external funding. VSB-TUO's Innovation Support Centre has a broad portfolio (entrepreneurship, tech transfer, projects) which it delivered through 45 staff. It operates entirely on external funding which shows the success of this centre in tapping to EU funds but also difficulties to source university funds for horizontal services. VSB-TUO's well-equipped campus caters for over 20 000 students and a growing R&D base. The campus will soon also host also a space for the career services, which requires strengthened human resources given the large student population.

The University of Ostrava is the second largest public university in Moravia-Silesia in terms of student enrolment. Originally founded on the basis of a teaching college, it has developed into a broad-based university complementing the technologically oriented offer of VSB-TUO with fields such as medicine. Attractive amongst

²⁸ The faculty has the right to make decisions and act on behalf of the public HEI in the design and implementation of degree programmes, the objectives and organisation of its core activities, internal organisation of the faculty, international relations and use the financial resources allocated to the faculty. It hires its staff and can initiate the procedures for the appointment of professors. Each faculty has a governance structure and competencies analogous to the mode applicable to the self-governing bodies at the level of HEI.

²⁹ It is worth noting that with the 1998 Higher Education Act the Czech university faculties lost the status of a legal entity. Consequently, faculty leaders can think that do not enjoy sufficient independence.

both Czech and international students, UO can select its degree students amongst a large pool of applicants but faces challenges with the decreasing per-student funding. Acknowledging that in the current governance and funding framework, structural changes are difficult to make and the only way to survive is to build R&D capabilities, the university has embarked on a road of incremental steps to develop centres of excellence in Fuzzy Modelling and Applications and Genomics and Biomedicine, which also provides opportunities for industry collaboration. Strategic openings include discipline-based partnerships in education (a fee-based study programme in physiotherapy in Switzerland) and evolving partnerships with Masaryk University.

The Silesian University of Opava operates in two campuses in Opava and Karvina offering degree programmes in business, public policies, nursing, tourism and hospitality, science and arts. It is starting to take advantage of interdisciplinary opportunities and has established a Centre for Empirical Research and a Centre for Audiovisual and Creative Industries. Challenges focus on the lack of critical mass and attractiveness.

The two **private institutions** in Moravia-Silesia are much smaller institutions which do not benefit from state support but draw their funding mainly from student fees. Their fee-based study programmes, just like any other degree programmes in Czech institutions, need to be nationally accredited by the Accreditation Commission. The Business School in Ostrava is following progressive competence-based pedagogies with a strong focus on entrepreneurship and could potentially play an important role in bridging the gap between business and higher education. The College for Social and Administrative Affairs in Havířov features some interesting examples in lifelong learning and up skilling public sector employees but faces challenges of sustainability due to small enrolments.

The Ministry of Education, Youth and Sport (MEYS) exercises its strategic leadership in higher education mainly through five-year strategic plans, the current one covering the period of 2011-2015. Each individual public university is required to elaborate a strategy for its own development for the same period. These strategies are annually updated which in principle provides an opportunity to respond to new trends and development needs. The fact that the institutional funding is defined only on an annual basis does not provide strong enough incentives for HEIs to modernise themselves or to provide a robust guide to institutional resource allocation based on collectively agreed priorities.

Funding policies

A complex funding policy lacks stability and gives no rewards for graduate production.

Funding policy is the most influential policy tool that governments can use to affect the behaviour of autonomous higher education institutions and their faculty. The funding system for HE educational activities is complex, provided mainly as block grants and as institutional formula-based funding, and to a lesser extent on a competitive and contractual basis (Box 17 below). The system lacks predictability which has a negative impact on public institutions.

Public HEIs receive the annual funding which is predominantly based on student numbers while HE graduates are no longer included in the criteria. In 2013, about 77.5% of a HEI's funding is based on numbers of students, 22.5% on performance criteria. The formula is different for bachelors, masters and doctoral degrees with a progressively higher weight of the performance criteria at doctoral degrees (only the standard length of a study programme plus 1 year is taken into account). As for 2013, the graduation rates or number of graduates are not included in the formula. HEIs receive a certain number of funded study places per year i.e. the limit number of students (LNS). If the university takes in more students it will receive only the funding equal to the LNS funding. If it takes in less, there is a bonus.³⁰

³⁰ For example if the university takes in 10% less than the LNS (maximum of 90% of the LNS), it will receive the funding equal to the LNS funding. If it enrolls less than 90% of LNS, for example 85%, it will receive funding equal to the 85% of LNS funding plus a bonus of 10% of the LNS funding.

Box 38. Funding for public HEIs for educational activities

The total budget for public HEIS (excluding R&D funding) administered by MEYS was CZK 21 803 billion in 2013. About 9% (CZK 1 995 billion) was allocated “to programme financing” for investment into buildings and facilities, while 91% (CZK 19 809 billion) funds HEIs’ activities.

There are four basic parts of state funding of HEIs:

Institutional formula-based funding (80% of total funding for educational activities) constitutes the basic part of the budget of public HEIs for education activities and is distributed as a block grant (lump sum). The formula consists of two parts: i) The Study Programmes Part that involves the number of funded students and the cost of provided degree programmes (80% of the formula funding). The number of financed students in the particular types of study programme is adjusted by a set of performance criteria including: institutional research output (weight differs from Bachelor’s to doctoral study programmes from 29.5% to 44.5%), the qualification structure of academic staff (weight ranges from 30% to 10%), student international mobility (weight 10%); and ii) Qualitative performance-based part (20% of the formula funding) is based on a set of qualitative indicators: institutional research output (weight 29%), HEI’s own income from external sources, the qualification structure of academic staff, employment of graduates (weight 32%), student international mobility (weight 22%).

Development of HEIs (6% of public HE funding for education activities in 2013) is competitive and contract-based targeted state subsidy that depends on the institution’s strategic plan and the long term strategic plan of the Ministry. The financial support to successful development projects is allocated on the basis of public tenders.

Student social affairs (11% in 2013) covers subsidies for meals, grants for student accommodation and various need and merit-based scholarships. The HEIs distribute these grants directly to students.

Internationalisation and other activities (2.5% in 2013) consists of funding for international programmes (CEEPUS, Aktion, co funding of student and staff mobility in ERASMUS programme, international agreements etc.) and various specific targeted subsidised activities and initiatives (e.g. for the University of the Third Age, for students with specific educational needs etc.)

Source : Kolar and Komensky (2013), based on MEYS data.

R&D funding and evaluation system provides perverse incentives.

The current R&D funding policies drive a uniform HE system where all public HEIs need to compete for research money, otherwise they will lose not only other funding but also the accreditation of study programmes in the fields in which the HEIs cannot prove their research activities.

The funding system for R&D uses mainly competitive measures, whereas about 40% of the funding, the Institutional Funding is allocated on the basis of the “Evaluation Methodology”. The methodology was created in order to ensure fair and transparent funding allocation based on research results. The Evaluation Methodology relies on National Information Register of R&D Results (RIV), in which universities and other research organisations list their research outputs across a range of publication types and innovation outputs such as patents, prototypes, software, methodologies etc. Each output earns a category-specific number of points for the organisation concerned. These evaluation results are then used to determine institutional funding, with the institution receiving a certain amount of funding (this varies by year) for each point.

The Evaluation Methodology is essentially a one-size-fits-all methodology which treats all institutions in the same way, against the goal of developing mission diversity. The methodology has many unintended effects on HEIs and individual researchers which also affect their Third Mission activities. The output-focused evaluation discourages demand-led R&D because it measures the immediate research outputs rather than the societal impact or usefulness of the research. The approach

favours basic sciences, but punishes social sciences and humanities as well as applied and innovation-relevant efforts. The approach also works against the development of new fields and capacities that have limited short-term outputs. The system encourages opportunistic behaviour by researchers. Long articles are split into smaller ones, patents are broken down into utility models and academics use their connections to influence or shape the boards of journals etc. The system supports fragmentation of research efforts, discourages collaboration and impedes the creation of university-industry links (Arnold, 2011).

The Evaluation Methodology is also used in the allocation of institutional funding. One of the key weaknesses of the funding system based on the Evaluation Methodology is that it reallocates the entire flow of institutional funding annually based on the outputs of the five preceding years, making the institutional funding both unstable and unpredictable. The results impact the public university formula-based funding.

Finally, the Evaluation Methodology has led to the “inflation of the points”. HEIs produce every year a larger number of articles and scientific outputs, whereas the quality does not necessarily improve but the funding per point decreases.

Non-strategic processes dominate in internal funding allocation.

The processes of internal budget allocation are the main tools for developing and driving the development of any modern HEI. By budgeting and planning, resources can be allocated against clear priorities which in turn helps avoid inertia and supports agility and transparency that are needed for dynamic change management. Institutional budget allocation becomes increasingly important when the institutions diversify their funding streams.

The high degree of faculty autonomy in the public HEIs has led to a tendency to limit the central university resources in favour of maximising faculty income and topping up the academic staff salaries. To avoid institutional inertia HEIs mimic the national funding allocation system or pass on the state funds to the faculties with only minor modifications, approaching budgeting as a purely technical exercise. The budget allocation within public HEIs implies that the income remains where it is “earned”, while a modest overhead is collected to support central services. In VSB-TUO, a 5% overhead has been fixed to support the university centre and institutional activities, whereas 45% is channelled to the faculty. In the University of Ostrava, lifelong learning offer is produced by faculties who pay no overheads on the income to the university centre.

HEIs are facing growing risks because of decentralised budget allocation.

The decentralised budget allocation system includes opportunities and challenges for institutional development and change. The system can incentivise income generation, entrepreneurialism and competition since the budget centre can be certain that for every additional sum it earns it will keep a high proportion for its own purposes.

The disadvantages of the decentralised funding allocation centre on challenges to induce institution-wide development, institutional fragmentation and financial and reputational risks. When the rate of overhead is set at a low level, the HEI lacks the ability to support the development of quality central services and the implementation of university level strategies. The decentralised funding model can lead to a fragmentation into a large number of self-standing units which each pursue their own interests rather than those of the university as a whole. The decentralised funding model also poses significant risks related to financial and reputation management which are related to national and increasingly EU legislation. Most notably these include equality and diversity issues and international accountancy standards.

Quality assurance: programme accreditation and academic career system

The Accreditation Commission plays a steering and monitoring role in the HE system which impacts the agility and ability of the HEIs to create their learning programmes. The accreditation system drives a uniform education provision focusing on academically oriented programmes rather than programmes that are labour market relevant, interdisciplinary or supportive of entrepreneurship. The current system also determines the mode of delivery of study programmes (including contact hours) and thereby reduces the HEIs' flexibility to take advantage of new and experiential modes of learning.

Public and private HEIs can admit applicants, hold lectures and examinations or award academic degrees only in study programmes that have been accredited by the MEYS on the basis of a positive statement from the Accreditation Commission.³¹ A HEI can obtain an accreditation for a study programme if the programme is taught by a certain number of professors or associate professors.

The Accreditation Commission has wide authorities in terms of programme accreditation, the shape of the HE system, internal structure the universities and the academic qualification and career system (Box 6.3). The Accreditation Commission is academically oriented in representation and orientation. Out of the 21 members, 2 members are from Academy of Science with part-time appointments at universities, 2 members are academics from abroad; and the remaining 15 members are academics from public Czech HEIs (one member who was external to higher education recently got a fulltime appointment in a university). It is supported by permanent and special working groups, organised by disciplinary groupings. Most members of disciplinary-based working groups are drawn from public universities, while those serving on the committee for the recognition of non-university institutions came from the established private non-university institutions. Working groups implement a peer review methodology that includes: an institutional self-evaluation, a site visit, a draft report prepared by a working group and reviewed by the institutional leadership, a presentation of the working group's findings to the Accreditation Commission, and publication of the conclusions and recommendations.

Box 39. The Role of the Czech Accreditation Commission

In the degree programme accreditation, the Accreditation Commission can either recommend accreditation (which the MEYS may choose to accept or reject) or recommend refusal, which the MEYS must accept. In the case of application for a re-accreditation, the Commission can recommend that re-accreditation is awarded, rejected or re-awarded on a condition, e.g. for a shorter time than the legally stipulated maximum.

The Accreditation Commission plays a system level steering role in determining the type of a higher education institution. In the establishment of private higher education institutions, the Accreditation Commission can recommend to the MEYS either to accept or refuse the application for the state permission (the application for the state permit costs currently CZK 25 000 or close to EUR 1 000). The Commission can also influence the governance of universities as it provides recommendations to MEYS on the establishment, merger, amalgamation, splitting or dissolution of a faculty (the final decision is made by the Academic Senate; there is anecdotal evidence of more splitting than mergers of faculties).

The Accreditation Commission plays a role in the Czech academic qualifications and career system because it recommends to the MEYS to award a university the authorisation to carry out procedures for habilitation and the appointment of professors. The doctoral degree programme accreditation, the accreditation of habilitation procedures and procedures for the appointment of a professor can be awarded only to universities. These procedures, determined by the HE Act, have to be accredited by the standards of the Accreditation Commission. For the accreditation of the procedures for conferring habilitation (*venium docendi*) and for the

³¹ The accreditation is awarded by the MEYS. Upon the recommendation of the Accreditation Commission, the Ministry can limit, temporarily terminate or revoke the accreditation.

appointment of professors, the Accreditation Commission evaluates chiefly the quality of doctoral studies and research output in the given field at the institution.

The Accreditation Commission evaluates activities pursued by higher education institutions and the quality of accredited activities. It also assesses other issues concerning the system of higher education presented to it by the MEYS.

Accreditation system drives academically oriented provision and limits the flexibility in delivery

The current accreditation process is not fit for purpose and requires reform. The background report notes a number of shortcomings: i) The model allows the Accreditation Commission to pursue its own HE policy independent of the MEYS policy, because of the “negative veto” when issuing a negative standpoint; ii) The recommendations of the Commission are prepared by the working groups whose functioning is not transparent; iii) The recommendations are not based on any existing complex system of accreditation criteria or indicators; iv) The accreditation and re-accreditation of over 8 000 study fields is beyond the capabilities of a body of 21 members and 5 administrative staff.

From the perspective of HEIs’ third mission and entrepreneurship education, the system drives a uniform academically-oriented provision which is weakly aligned with the labour market needs. Due to the non-existent representation from the labour market and from students the commission and its working groups give significantly more weight to considerations of academic staffing and physical resources than meeting the labour market demands or learning and employment outcomes.³² University faculty members play a strong role in the approval of professionally oriented programmes in which their expertise is questionable. The introduction of entrepreneurship programmes appears to be cumbersome. The programme accreditation puts weight on the traditional research outputs by the professors rather than industry relevant R&D. This has led to the problem of “flying professors” as academics “lend” their academic credentials to several institutions. While there appears to be no transparent criteria on what counts as a research output, there is anecdotal evidence that applied research is only recognised if it is undertaken on behalf of government or state agency or under a multinational research programme. Private HEIs pointed out that only two types of journals are accepted in the criteria: international journals and Czech journals which belong to the Research, Development and Innovation Council RIV database and that are in practice controlled by public universities.

The current programme accreditation system also determines the mode of delivery of study programmes and thereby reduces the HEIs’ flexibility to take advantage of new and experiential modes of learning. Programme accreditation appears to be smoother for those study programmes that emulate the existing programmes in the prestigious Czech universities. This acts as a disincentive for developing a more diverse offer as HEIs tend to focus on “safe” options prioritising the stand-and-deliver lecture model with limited experimentation. Czech HEIs cannot take advantage of “flipping the classroom” by integrating MOOCS (massive open online access courses) into their existing programmes and focusing on more personalised teaching, group projects, discussions and personalised tutoring that would help develop more student-centred learning and reduce the high dropout rates.

³² The level of student participation in quality assurance is limited. Students are not present in governance structure of the Accreditation Commission, they do not take part in the decision making processes for the external reviews. Usually they do not participate in the preparation of self-evaluation reports but this is up to the faculty to decide. Students may participate as members of external review teams of the reviews of the Accreditation Commission and sometimes in internal follow-up processes. (See EURYDICE (2012), The European Higher Education Area in 2012: Bologna Process Implementation report.)

Private HEIs face additional hurdles to gain accreditation for their programmes. While private universities in principle can become more closely aligned with labour market needs, they can operate only after being awarded the state approval from the Ministry of Education which is based on the positive opinion of the Accreditation Commission confirming that the private HEI is able to provide at least one degree programme. The application for the state permit for a private HEI has been charged by CZK 25 000 (slightly less than EUR 1 000). Accreditation of study programmes is free for all HEIs.³³

Career system with habilitation and strict career requirements reduces flexibility of institutions.

The Czech HEIs are in principle highly autonomous in staffing matters.³⁴ The system of decentralised governance within public universities means that the faculties are in charge of the staff recruitment, development and remuneration. The freedom of academics can ensure financial incentives for those academics who can supplement their capped salaries by taking on industry collaboration or additional employment in private universities.

In practice, however, the Czech HEIs' are constrained by the current academic qualifications and career system. The Czech career system with habilitation and strict career requirements involves a number of weaknesses that affect public and private higher education institutions' flexibility. Key issues include: i) The right of habilitation has been awarded to only public universities³⁵, ii) External professionals who teach at HEIs remain in the position of assistants, ii) The system limits the supply of available professors and associate professors and leads to a practice of holding multiple appointments by "flying professors."

Attraction and motivation of academic staff is complicated also in the HEIs in the Moravia-Silesia. For example academic staff members of University of Ostrava have predominantly pedagogical faculty backgrounds with limited tradition in R&D. The Silesian University of Opava's large business administration school (4 000 students) lacks the rights to internally promote its professors and PhD students, remaining dependent on recruiting faculty from other universities. Private HEIs face also difficulties. Ostrava Business School reports challenges in attracting educators with the academic qualifications required by the national accreditation system.

Recommendations

Recommendations for national government

Continue the efforts to reform the higher education legislation and the higher education system. The implementation of controversial HE reforms has a higher probability of success when decision-makers manage to: i) assess the social and political context in order to review the needs and preoccupations of all major stakeholders; ii) build a consensus amongst the various constituents of the HE community through a consultation process; iii) mobilise additional resources to provide tangible incentives in support of the reform and iv) Time and sequence reforms using a roadmap over a longer period to allow time to build a consensus.

³³ MEYS has planned to introduce costs for programme accreditation for private HEIs, while the door for introducing accreditation costs to public HEIs has also been left open.

³⁴ Only the appointment of some senior academic staff members in public universities must be confirmed by an external authority.

³⁵ All public universities (and all their faculties) have been awarded the habilitation right in some fields, but not necessarily in all the fields in which they provide education.

Provide incentives for HEIs to play an active role in regional innovation, human capital development and community engagement. Consider a diverse range of mechanisms that combine long term core funding and/or additional strategic and competitive funding, such as: i) Formula for block grant funding against outcomes could include higher weights for student completion as well as enrolment of students from within the region, from special populations such as minorities, or for enrolment in degree programmes related to regional labour market needs; ii) cost-sharing in higher education could facilitate equity and relevance if policies governing tuition fees would allow for lower fees for students from region and if in-region students and special populations could benefit from higher student support; iii) Targeted competitive funding contingent on evidence of regional engagement and focus on industry collaboration and entrepreneurship; iv) Targeted funding to match funding obtained by HEIs from contracts with regional employers for education and training services; v) public-private regional investment fund that could help build capacity for regional/local engagement and provide incentive funds to institutions and individual faculty members for regional initiatives; and vi) competitive funding schemes that could boost challenge-driven RDI-projects and new solutions to address challenges such as pollution, ageing and minority issues.

Consider introducing a national level funding mechanism to support university business and community engagement and entrepreneurial activities and strengthen the accountability of higher education institutions to society by developing indicators and monitoring outcomes to assess the impact of their teaching and research on business, the labour market and civil society locally and nationally. Include a self-assessment of these impacts in regular institutional evaluations.

Box 40. The Higher Education Innovation Fund, HEIF, and Higher Education and Business Interaction Survey, HE-BCIS (UK)

The Higher Education Funding Council for England (HEFCE) launched the Higher Education Innovation Fund (HEIF) in 2001 to support and develop a broad range of knowledge exchange activities that result in economic and social benefit to the UK. HEIF provides special funding to universities to support activities which increase their capability to respond to the needs of business (including companies of all sizes and sectors and a range of bodies within the wider community) where this will lead to identifiable economic benefits. Early rounds of HEIF built capacity and provided incentives for all English higher education institutions to work with business, public sector bodies and third sector partners, with a view to transferring knowledge and thereby improving products, goods and services. Following ten years of capacity building, from 2011 HEIF became performance based and was awarded to 99 English HEIs. The Higher Education and Business Interaction Survey HE-BCIS support the allocation of HEIF funding. It covers a range of activities, from the commercialisation of new knowledge, through the delivery of professional training, consultancy and services, to activities intended to have direct social benefits. "Business" in this context refers to private, public partners of all sizes and sectors, with which HEIs interact in a broad range of ways. "Community" refers to society as a whole outside the HEI, including all social, community and cultural organisations, individuals and the third sector.

HEIF and HE/BCIS are relevant for the Czech Republic as they provide an example of a long term government incentive and accountability system to HEIs to engage in innovation. While HEIF represents only a small portion of HE funding, it has contributed to exponential growth of university-industry engagement. The evaluation in 2011 showed a minimum return on investment of GBP 6 for each GBP 1 spent. HEIF is relevant for the HEIs in Moravia-Silesia and other Czech regions as both individual HEIs and thematic and regional consortia have been able to apply for HEIF funding.

The challenges in implementing HEIF have been solved through several iterations (2001-2003, 2004-2006, 2006-2008, 2008-2011, and 2011-2015); changes have been introduced in the forms of allocation reflecting the increasing capacity of HEIs to engage in innovation. There has been a gradual move from projects funded by competitive funding to combination of collaborative competitive projects and formula-based funding, and to the current performance-based funding model. Unlike many other programmes, HEIF has sustained the test of times and the economic downturn. For the ongoing round 5 (2011- 2015) the funding has been maintained at GBP 150 million per annum. Allocations are performance-based: institutions are eligible to receive an allocation if they exceed GBP 250 000 allocation threshold related to their external income earnings and the performance of the

sector over all as captured in HE-BCI survey which is an integral part of HEIF.

When funding knowledge exchange activities MEYS could consider a similar progressive approach as HEIF has done, gradually moving towards performance-based funding, while the capacity amongst HEIs in industry and community engagement is developing. For example in the interim period MEYS could utilise allocation by a combination of formula funding to all HEIs based on data collected via a survey similar to HE-BCIS and collaborative competitive projects. The elements of the formula could include: i) potential and capacity building; ii) external income as a proxy for demand; and iii) activities not best measured by income. Institutional accountability should be ensured via submission of institutional plans and annual monitoring. Large scale projects including several HEIs and external partners from business and community organisations as well as development of Centres for Knowledge Exchange could be supported. Developing a survey and reporting system could help HEIs to demonstrate their public accountability through diverse range of external engagement. HE-BCIS provides a good example because it takes into account the different types and sizes of institutions and broadens the focus of university engagement from industry engagement to social, community and cultural development. This type of a survey could also complement the one-size-fits-all approach of the Czech Evaluation Methodology and support the Czech authorities aim to enhance diversity in higher education. In order to ensure an institutional buy-in MEYS should engage HE community in the development of the survey.

Source : HEFCE (2012), Funding for knowledge exchange - Higher Education Innovation Funding (HEIF), HEFCE, Bristol, www.hefce.ac.uk/whatwedo/kes/heif; HEFCE, 2012, Higher education-business and community interaction survey, HEFCE, Bristol, www.hefce.ac.uk/whatwedo/kes/measureke/hebcj; PACEC (2012), Strengthening the Contribution of English Higher education to the Innovation System: Knowledge Exchange and HEIF Funding, Cambridge, Public and Corporate Economic Consultants, report for HEFCE.

Provide incentives for HEIs to play an active part in the smart specialisation process. International models come from Austria where the Federal Ministry of Science and Research has taken an advantage of the universities' three year performance contracts and the internationalisation strategy for research that help HEIs position themselves in their region.

Box 41. Performance contracts in Austria mobilise universities for regional RIS3

The Austrian Federal Ministry of Science and Research has encouraged universities to take a proactive and leadership role in regional smart specialisation strategies. As part of the universities' three-year performance contracts the Ministry has invited Austrian universities to position themselves in their region in order to integrate their regional role into the internationalisation strategy for research. With the help of the "location concept" (*Standortkonzept*) the university is able to highlight its position within a critical network of excellence with strategic partners in industry, business and academia in a self-selected area of close collaboration and will also be able to attract private and public funding including EU cohesion funding.

The use of location concepts embedded in the three-year performance contracts is relevant for MEYS because it is in charge of the development of smart specialisation strategies in the Czech Republic and will need to encourage HEIs role in these strategies. While it is too early to evaluate the success of this initiative, it has already highlighted the importance of regional development amongst the public HE system in Austria. It has also managed to mobilise 15 out of 22 universities in the ongoing process of capacity development which involves self-assessment, identification of key partners/networks, target setting and monitoring by mid-2014. No additional funding has been allocated for HEIs for the process, but the outcomes may impact national funding allocation in future.

The practical implementation of this approach would require an active role by MEYS. As in Austria, the Ministry should negotiate with the HEIs and monitor the implementation of the strategies, for example using the 5-year strategic plans for this purpose. It should also provide feedback on the strategic outcomes and, where necessary, broker between the players in higher education and research sector at the regional and national level.

Consider mobilising private funding for HEIs including charitable donations, trusts and alumni. Investment in the fundraising infrastructure can also support regional engagement. The HEIs in Moravia-Silesia have not yet taken action to diversify their funding streams through voluntary giving.

Box 42. Stimulating voluntary giving. Matched funding scheme for charitable donations to universities (UK)

Recognising that the investment in the fundraising infrastructure can generate real rates of return for HEIs, the UK Government launched a GBP 200 million matched funding scheme for voluntary giving in 2008. The matched funding scheme began in August 2008 for a three year period. Funding was available to match eligible gifts raised by English higher education institutions and directly funded further education colleges. There were three levels of funding:

- First tier 1:1 private to public: intended for the least-experienced fundraising institutions and those looking to build capacity from a low base. Every GBP 1 raised will be matched in full.
- Second Tier: 2:1 private to public: intended for the majority of institutions with existing development programmes. Every GBP 2 raised will be matched by GBP 1.
- Third Tier: 3:1 private to public: intended for the most experienced fundraisers. Every GBP 3 raised will be matched by GBP 1.

Higher education institutions were able to request their own tier, with the exception of the Universities of Oxford and Cambridge, which were included in the third tier. All directly funded further education colleges wishing to participate in the scheme were automatically included in first tier. Each institution's tier and cap level was confirmed by the Higher Education Funding Council (HEFCE) prior to the start of the scheme.

The following forms of giving were eligible for match funding: actual gifts of cash, gifts of shares, gifts from small/medium-sized charitable trusts and foundations, gifts through higher education institutions own non-consolidated development trusts, corporate gifts, and overseas gifts. Legacies and gifts in kind were not eligible for matching. Higher education institutions had the freedom to decide how match funding was spent.

The matched funding scheme is relevant for the Czech Republic because it provides an example on how to diversify higher education funding streams in a structured way but acknowledging that all HEIs do not have a similar capacity to raise funds. The HEIs in Moravia-Silesia and elsewhere in the Czech Republic are facing financial constraints due to the declining youth cohorts and therefore need to diversify their funding streams. So far most Czech HEIs have not developed robust fundraising experience. MEYS could help mobilise HEIs to raise private funding with matched funding schemes drawing on the experience from Finland, UK and Singapore, where governments have recognised that the investment in the HE fundraising infrastructure can generate significant rates of return and have sought to stimulate this activity by matched funding schemes. The UK experience is particularly useful for MEYS as it provides an example of a system which recognises institutional diversity: In the UK system HEIs of different capacity were treated in a different way. The UK system has also recognised the diverse forms of giving.

For practical implementation it would be important to maintain the tier system and ensure that HEIs are able to request their own tier, with the possible exception of the leading universities, which could be automatically included in the top tier. Each institution's tier and cap level should be confirmed by MEYS prior to the start of the scheme. HEIs should also have the freedom to decide how the match funding is spent.

Source : HEFCE (2008), "Matched Funding Scheme for Voluntary Giving 2008-2011", Circular Letter, No. 11/2008, HEFCE, Bristol, www.hefce.ac.uk/pubs/circlets/2008/cl11_08/

Encourage collaboration between HEIs to improve the supply and demand of HE/research training provision through the development of joint programmes, RDI activities, and shared services and facilities, in order to make better use of resources and to achieve greater impact. Incentivise

rationalisation of programme offer within individual HEIs and across HEIs. Eligibility for targeted competitive funding could be made contingent on inter-institutional and intra-institutional collaboration. This could provide incentives for HEIs to facilitate mobility of students (credit transfer within the region) and share programmes and resources in efforts to serve the region.

In the allocation of research funding, replace the Evaluation Methodology by a system of performance contracts with both prospective and retrospective components, supported by objective indicators and international peer review. Develop a performance-based model that has multi-year time constants and reallocates only small proportions of institutional funding from weakly performing groups to the better performers, allowing improvements to be made over time.

Consider distinguishing the quality assurance for improvement purposes from the quality assurance for accreditation. The current system combines these two elements with the result that HEIs do not seek or receive constructive feedback for quality improvements because this will result to a non-accreditation or cancellation of the programme. Transfer some of the current responsibilities of the Accreditation Commission to HEIs. These responsibilities include: the accreditation of study programmes and fields of study, and the qualifications and career system, including professorial positions. Transferring these responsibilities to the HEIs would ensure that organisation in charge of quality assurance could focus on the institutional accreditation.

In anticipation of a more profound reform of the quality assurance system, tweak the quality assurance system to ensure fitness for purpose and greater labour market relevance. Important steps include ensuring that the Accreditation Commission: i) would focus on reaccrediting larger group of study programmes at the same time, ii) would become more developmental as a facilitator of quality improvements; iii) would include labour market representatives as a standard feature. Finally, criteria emphasising engagement, local labour market relevance and entrepreneurialism could be included in the programme review.

Take steps to develop a more diverse academic career structure on the basis of a tenure system, rather than the existing system of habilitation. Revise academic recruitment/career structure to reflect a broader range of research outputs, impact and engagement in order to incentivise faculty to engage in teaching and research that meets the needs of the Czech Republic. Ensure that PhD holders with appointments in HEIs can advance to the rank of a professor. Ensure that business/industry/public professionals who teach in HEIs are granted appropriate compensation, advancement and status.

Recommendations for local and regional governments

Consider the establishment of a special regional investment fund (funded from public and private resources) to build capacity within HEIs for regional engagement and entrepreneurship. It could also provide incentive funds to institutions and individual faculty members for regional initiatives, such as engaging faculty members and students in teaching and learning and applied research projects related to regional priorities.

Box 43. Kentucky Regional Stewardship (US)

The Regional Stewardship Initiative of the Commonwealth of Kentucky is a comprehensive strategy to provide incentives for universities and other tertiary education institutions to support regional engagement. The goal of the Regional Stewardship Program is to promote regional or state-wide economic development, liveable communities, social inclusion, improved K-12 schools (primary and secondary schools), creative governance and civic participation through public engagement activities initiated by university faculty and staff. To help accomplish this goal, campus administrators are expected to design and implement programmes that align institutional resources and infrastructure to support their missions as “stewards of place”, and to create partnerships and

undertake engagement activities that address regional and state needs. The programme supports infrastructure, comprehensive university efforts to build intellectual capacity in stewardship priority areas and specific public engagement activities.

The Kentucky Regional Leadership is relevant for Moravia-Silesia because of its broad focus on sustainable environmental development, improvement of quality and relevance of education at schools and active civic participation which are all challenges in Moravia-Silesia. The difficulties in implementing the initiative derived from the diversity of eligible institutions with different strengths and focus areas. These challenges were overcome by providing three forms of funding incentives to institutions: i) infrastructure funds to support the development and maintenance of organisational structures, personnel, information systems and community relationships directed towards the identification of regional needs, opportunities and stewardship priorities; ii) regional grant funds to support comprehensive university efforts to build intellectual capacity in stewardship priority areas; and iii) the stewardship initiatives pool to support specific public engagement activities at the institutions that improve economic prosperity, quality of life, or civic participation in the region, while furthering the goals to increase the educational attainment of the regional population.

An application of this approach in Moravia-Silesia could be the establishment of a special regional investment fund (funded from public and private resources) to build capacity within universities for regional engagement. The regional investment fund could provide incentive funds to institutions and individual faculty members for regional initiatives, such as engaging faculty members and students in teaching and learning and applied research projects related to regional priorities. Public accountability would need to be respected. For example in order to qualify for regional grant funds, each institution should submit a strategic plan for stewardship activities and a priority area proposal to the regional government.

Source : Kentucky Council of Postsecondary Education "Kentucky Regional Stewardship",
http://cpe.ky.gov/policies/budget/reg_steward_program.htm

Work with the universities in preparing an integrated regional and local place-based strategy. Such a strategy should incorporate the contribution of higher education to all facets of economic, social, cultural and environmental development, foster co-operative projects in regional and local development, and facilitate closer co-operation between the public and private sector and academia.

Ensure that HEIs have a strong voice on the committees established to shape and oversee the implementation of the new round of the European Structural Funds and clarify the roles of different institutions in the regional innovation system.

Improve the capacity for local and regional engagement amongst key public and private stakeholders and higher education institutions through forums for communication and programmes where good practices can be fostered and through targeted training programmes with focus on practical problem solving. Consider launching a Leadership Development Programme with the HEIs to develop people able to work between the higher education and business and industry and the local civil society.

Invest jointly with higher education institutions in programmes that bring benefit to regional businesses and community. For example translational research facilities which are aligned with the needs and opportunities of the region, advisory services for SMEs, professional development programmes, capacity building programmes for public and third sector employees, graduate retention and talent attraction programmes.

Recommendations for HEIs

Address the challenges of shrinking age cohorts by lowering the institutional costs structures, introducing a more strategic approach into the internal funding allocation and diversifying funding streams to lifelong learning activities, entrepreneurial activities, collaborative research with industry

and national and EU grants. With the ageing population and shrinking youth cohorts, Moravian-Silesian HEIs face a critical juncture in the development of their business models that need to fundamentally change to achieve long term financial sustainability. Public HEIs' national revenue streams may be further reduced with the decreasing per-student funding while private HEIs face continuous financial pressures in order to provide financially sustainable options to government supported higher education.

Choose to focus on some areas of activities on the basis of the identification of institutional strengths and the needs of the region and the society at large. While the national policies and incentives drive a uniform higher education, the Moravian-Silesian HEIs cannot do everything in an equal measure in order to reach global levels of excellence. By collectively agreeing on its priorities a HEI can translate these priorities into: resource allocation, faculty and department level aims and objectives, performance measurement and monitoring, continuous assessment and control of risks, and strategic reflection on the institutional strengths and weaknesses, academic character and aspirations.

Depending on the institutional profile, identify civic and/or industry engagement as part of the university's mission. Establish mechanisms to monitor not only the outputs but also outcomes of city and regional industry and civic engagement and entrepreneurial activities. Develop senior management teams to deliver the institutional "corporate" response expected by regional and local stakeholders without discouraging entrepreneurial academic.

Complement the decentralised budgetary system with a clear strategic planning framework. This requires three key elements: i) the institutional leadership that has a vision and the mission and is able to inspire institutional commitment from faculties and students, ii) robust and transparent management and information systems for budget allocation, and iii) close communication between the Rector and the constituent budget centres, ensuring that the budget centres operate within a clearly defined strategic plan to pursue priorities to which they all subscribe.

Review recruitment, hiring and reward systems to include regional development agenda and entrepreneurial activities. In order to strengthen the research base, to make universities more relevant for the region and to provide stronger incentives for regional engagement and entrepreneurship, criteria for faculty promotion could emphasise: i) research on issues relevant to the region; ii) service to community, while requiring evidence that contributions to the community and the region are documented and externally validated; and iii) collaboration between the institutions in the region. Create mechanisms to monitor and evaluate the activities in this area to share good practice within their institution and benchmark this experience with other organisations and localities.

Box 44. The University Rovira i Virgili - a long-term commitment to the economic transformation and industry specialisation in Southern Catalonia (ES)

The University Rovira i Virgili (URV) has for the past 15 years systematically built the capacity for regional development. Following a strategic decision in 2001 URV has focused on areas of specialisation important to the region and aligned its education, RDI and service with the regional priority areas. URV has an active agenda in "third mission" activities, such as entry points for SMEs to the university knowledge base as well as social and cultural programming in 22 cities in Southern Catalonia. Its long-term co-operative relationship with the chemical industry incorporates both research and human capital development programmes that are relevant to the industry needs. Its industry-centred model is oriented toward increasing the productivity and competitiveness and innovative capacity of local industry firms, both large and small. URV emphasises the development of skills and human capital resources that can bring new ideas and business practices to local firms. Skills are developed at every level, from the technical operative workforce to executive management. There are strong alumni connections and students participate in internships and co-operative programmes within the local firms. Both advanced technical vocational skills and higher degree based skills such as in engineering are designed in co-operation with the local industry representatives. An important element that supports URV's regional engagement

and strategic goals are its HR policies and mechanisms that enhance, recognise, reward and evaluate regional engagement along with excellence in teaching, research and management. The university staff contracts recognise the importance of and give value to the staff participation in these outreach efforts.

The URV example is relevant for HEIs in Moravia-Silesia and the Czech Republic in general because URV operates in the Spanish higher education system which shares some of the key features of the Czech system including strong representative decision making bodies and weak representation of external stakeholders in the university governance. The URV example is relevant for HEIs in Czech regions also because it demonstrates how universities can play a leading role in regional development in peripheral regions.

The URV achievements are clear. During the economic crisis, URV has been the only Spanish university with no deficits. URV has developed a strong institutional specialisation in the HE system which is characterised by lack of diversification. URV has assumed a leading role in Southern Catalonia's transition to knowledge-based economy: in 2010, capitalising on the Spanish HE reform and the Campus of International Excellence call URV launched the Campus of International Excellence of Southern Catalonia (CEICS) as a tool for coordinating the knowledge and innovation ecosystem in Southern Catalonia. URV now coordinates the CEICS with 22 strategic partners (5 research centres, 6 technological centres, 5 research hospitals and 4 enterprise associations) in five strategic areas: i) chemistry and energy, nutrition and health, tourism, oenology, and culture and heritage. URV has played an important role in setting the CEICS agenda that operates through a broad range of transformative projects, renewal projects and incremental projects. The CEICS portfolio includes technology centres, networks of doctorates, joint doctorates, programmes of talent attraction, scholarships, cooperative strategic projects, Innovation Hub, Innovation Communities and enhanced VET collaboration.

URV has overcome the challenges of HE governance system, the fragmented regional leadership and the issues of motivating HE staff in engagement by leadership which has created consensus amongst competing local authorities, key employers and trade unions and the URV governance bodies. URV has encouraged staff engagement in regional development by developing HR policies and mechanisms linked to academic research contract. These contracts set a base expectation for the staff performance and an evaluation method which creates the flexibility to allow all staff members to contribute to regional engagement activities.

In implementing similar approaches in the HEIs of Moravia-Silesia it is important to focus not only on developing a strong research base, but also a broad outreach agenda including technology transfer, skills development for industry and cultural outreach in communities. In terms of practical implementation the URV experience highlights the importance of creating concrete incentives for staff for engagement beyond research and teaching, and methods to evaluate those contributions. As in URV, HEIs in Moravia-Silesia could consider developing staff contracts which are organised around a system with a ten-point base. All staff members are expected to do research and to teach, with the minimum contractual obligations constituting six of the expected ten points. To reach the expected ten points, university staff member can contribute in a variety of ways, according to their interests and expertise.

Source : Source: OECD (2011).

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SUMMARY OF FINDINGS AND RECOMMENDATIONS

The concluding part of the report summarises the key findings and presents policy recommendations – introduced in the previous chapters – in a way that follow-up actions can be discussed by the HEIs in the region together with the wide range of development stakeholders at local, regional and national levels.

It is structured in four parts, of which the first three focus on the role of HEIs in (i) human capital and skills development in the region, (ii) research, development and innovation, and (iii) entrepreneurship development. The fourth part summarises the national higher education framework pointing towards key barriers and institutional-level impacts and responses.

The role of HEIs in human capital and skills development in the region³⁶

Moravia-Silesia's population is shrinking because of out-migration and ageing. This is negatively impacting on labour market and dependency patterns causing growing skill shortages, rendering difficult the ongoing transition of an economy, formerly based on heavy industry to one that is based on knowledge, innovation, entrepreneurship and networks.

A key development opportunity is the presence of five higher education institutions with students accounting for approximately 10% of the population of Ostrava city and 3.5% of the regional population. The regional mix of HEIs with different ages, cultures, history and academic focus allows for diverse approaches and significant potential for development in terms of blending domains and competencies. There are abundant possibilities to increase collaboration and to enhance their individual and collective co-operations with regional employers.

Signs of a mismatch between the supply and demand of high skills

The regional economy is showing signs of an increasing mismatch between skills supply and demand in the high skills sector. The last years of information (2002-2013) show that unemployment rates for Bachelor-level graduates are at the same level or below compared to graduates from master and doctoral programmes. This suggests a shift towards qualified but cheaper labour force amongst the regional employers. Focus groups with students and alumni provided confirming information. Whereas this development could partly also be explained by an increase of bachelor graduates who continue in higher education, it still points towards a mismatch between skill supply and demand.

There are also signs of a mismatch in the development of technical professional skills. Under the present conditions it is difficult for HEIs to fulfil industry expectations in the development of technical professional skills. The types of programmes offered by tertiary-level professional schools do not seem to match the skills needs of the regional industry, and Bachelor degrees do not meet the needs for more professional and experience-based skills. Whereas secondary level VET has a long tradition in the Czech Republic, tertiary professional schools were introduced only in 1995 to develop the

³⁶ This section is a summary of Chapter 1 by Maite Martinez-Granado.

tertiary-level vocational sector. It lacks tradition and suffers from reputational difficulties. This, and the fact that students have to pay tuition fees, makes non-university vocational higher education unattractive to both students and employers.

Recommendation: *Respond to emerging signs of a mismatch in the high skills sector.*

The signs of an increasing mismatch between supply and demand in the high skills sector should be investigated further. This should include a skills and labour market observatory, which provides robust information on current tendencies and future development trajectories.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • Regional Employment Agency • MS Pact • Ministry of Education, Youth and Sports
An international example that could provide inspiration:	LANBIDE and the Basque Observatory for employment of graduates (ES) (see Chapter 1)

Opportunities for educational pathways

There are several examples of links between HEIs and secondary schools. Various initiatives aim at addressing the low interest in engineering and science studies amongst secondary school students.

Recommendation: *Encourage student volunteering and introduce credit-bearing outreach activities*

Interviews with students in Moravia-Silesia indicated that the university could play a much more active and encouraging role to promote students-support-students activities on campus and beyond. Students can also help raise aspirations for higher education and raise interest in engineering and science studies amongst secondary level students. HEIs support for this type of activities has an important symbolic value for students.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Secondary schools • Ministry of Education, Youth and Sports
An international example that could provide inspiration:	First Lego League (DN, worldwide) (see Chapter 3)

No institutionalised strategic links exist between tertiary professional schools and HEIs (with the exception of CoSaAA. Cooperation is possible but, in practice, HEIs perceive that joint study programmes and/or high permeability of students and programmes would devalue university education, given the less strict legal framework that applies to tertiary professional schools. Pathways or permeability between tertiary professional education and higher education would enhance the relevance of higher education in life-long learning. Given its ageing population and out-migration, Moravia-Silesia cannot rely only on young people as the primary suppliers of skills. A wide spectrum of full- and part-time adult learning activities is needed.

Recommendation: Enhance permeability between tertiary professional education and higher education.

The RIS3 strategy and the initiatives started by the MS Pact for Employment could be an umbrella for enhancing permeability. The scope for collaboration should be reviewed and focused more on technical training, management studies, and life-long learning in core regional industry sectors and clusters.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • MS Pact • Ministry of Education, Youth and Sports
An international example that could provide inspiration:	<p><i>Joint programme “Innovation Engineering in Processes and Products” recently inaugurated by the University of the Basque Country and the Machine Tool Institute (ES)</i></p> <p><i>(see Chapter 1)</i></p>

Addressing dropout rates

For all public HEIs in Moravia-Silesia dropout rates are persistently high, especially for first year students. Also, large numbers of students extend their studies beyond scheduled time. Due to the lack of sufficient student tracking there is limited robust information at the regional HE system or institutional level about the actual dropout reasons of student-related characteristics. This makes it difficult for governments and HEI managements to allocate resources, which are, however, much needed to counteract the negative effects at regional and national levels due to the postponement of the students’ entry to the labour market, and the potential scarring effects for learners.

Measures to address the dropout phenomenon do not appear high on the agenda of HEIs in the region. Anti-dropout measures are generally left to individual faculties. Long-term measures (e.g., tutoring in small groups, student tutoring) are missing with the focus of current measures on supplementary and often fee-based courses in the most problematic subjects prior to enrolment.

Recommendation: Systematically provide early intervention measures to enhance academic performance and monitor student progress.

HEIs should develop support systems to reduce persistently high dropout rates. Support measures should be targeted at students who are academically weaker, come from lower socio-economic backgrounds or minority groups or who combine work and study. This can be achieved through orientation, information and guidance to prospective students on learning programmes (e.g. using alumni or current students as ambassadors), and preparation efforts prior and during the first year to allow students to catch up in the basic subjects of the study programme (e.g. mathematics, physics). Students would also benefit from courses on time and stress management and career counselling. Such a support system should be built into and based upon a HEI-based system, which monitors student satisfaction with the quality of higher education, encompassing teaching and learning, curriculum and student life.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Secondary schools
An international example that could provide inspiration:	Access & Civic Engagement Service of the Dublin Institute of Technology (IR) (see Chapter 1)

Students do not have enough activities to develop soft skills

Ensuring that students gain transferable soft skills during their university studies is a key challenge for HEIs in the region. There are efforts underway to promote soft skills development in earlier levels of education, and the MS Pact for Employment is very actively involved, but at higher education level, soft skills are – except for a few initiatives – not systematically integrated into study programmes, but considered as falling under the responsibility of career services.

Recommendation: Enhance the attainment of soft skills as an integral part of study programmes.

Soft skills are crucial for employability. Soft skills have been promoted in a VSB-TUO pilot initiative as part the “Engineering and Computer Science” degree. This should be expanded into other study programmes. Also the “Competencies for Life” work of the MS Pact for Employment should be scaled up and mainstreamed in all HEIs.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • MS Pact • Ministry of Education, Youth and Sports
An international example that could provide inspiration:	Mendeberri at Mondragon University (ES) (see Chapter 1)

HEI do not sufficiently expose their students to internationalisation

All HEIs in the region are actively involved in internationalisation with a focus on mobility of students and staff. Institutionalised academic co-operation remains low with international contacts fragmented and focused on individuals and not linked to an overarching institutional strategy that comprise teaching, research and knowledge exchange.

A key barrier for internationalisation is the low level of foreign language skills amongst HEI students, staff and graduates. If not addressed, this can reduce attraction of foreign investment as well as the capacity of local firms to expand internationally. A good command of a foreign language seems to be perceived by the HEIs as the student’s responsibility. Institutional efforts to support foreign language(s) acquisition are still at early stages of development. Although HEIs offer degree programmes in foreign languages, these are fee-based for Czech students, thus discouraging participation. To remedy the limited offer of study opportunities in foreign languages – which is partly also due accreditation – some HEI leaders allow educators to teach in a foreign language if students in class demand this.

As mobility is limited to a small percentage of student and staff population, the HEIs will increasingly need to focus on “internationalisation at home”. Integrating a global dimension into the design, content and delivery of study programmes and teaching/learning processes could ensure that

the 80%-90% of students who do not take part in international mobility acquire internationally relevant skills.

Recommendation: *Develop comprehensive internationalisation strategies and resources.*

An important step towards more and better internationalisation is to enhance the foreign language skills of students and staff. This can be facilitated by attracting foreign teaching and research staff, taking advantage of massive open online courses (MOOCs), participating actively in (multi)disciplinary international networks and establishing on-campus language learning centres with a wide offer of language learning facilities for individual and group learning which help to move away from the current grammar-based education to international communication skills.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Ministry of Education, Youth and Sports
An international example that could provide inspiration:	System of Language Provision at the University of Warsaw (PL) <i>(see Chapter 1)</i>

HEIs do not sufficiently track employment outcomes

None of the HEIs in Moravia-Silesia has developed a robust system to monitor the labour market outcomes of their graduates. The Ministry of Education, Youth and Sport is monitoring graduate unemployment per HEI but there is no information about satisfaction with the competences (attitudes, knowledge and skills) acquired in higher education. Furthermore, the information is not readily available for HEIs but collected and stored centrally. An HEI-based systematic tracking of students' progression could help to identify drop-out causes and correct the high drop-out rates and facilitate retention if effectively supported by early intervention measures.

Recommendation: *Introduce HEI-based systems to monitor employment outcomes of graduates.*

A HEI-based system should be developed, which monitors the employment outcomes of graduates. All-campus or faculty-alumni associations should be used to get and keep in touch with graduates and regularly gather data through short online surveys and social activities.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Alumni • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • MS Pact • Regional Employment Office • Ministry of Education, Youth and Sports
An international example that could provide inspiration:	LANBIDE and the Basque Observatory for employment of graduates (ES) <i>(see Chapter 1)</i>

Employers are not sufficiently involved in the design and delivery of study programmes

Higher education remains largely supply-driven rather than demand-based with little evidence of co-constructed study programmes. Aligning study programmes with the needs of regional employers proves difficult to organise. A systematic approach to increase alumni links is also absent. Most of the links to alumni and external stakeholders remain at individual levels, and thus remain un- or underutilised potential for the HE, not reflected in their education, research and third mission activities.

Work-based learning through internships is not an entitlement for all students. Internships fall within the autonomy of faculties and rely largely on individual contacts. There are no provisions for students to dwell on their internship experiences within the study programme or course or to share their experiences with other students. Most HEIs in the region have recently developed career services. These services are at early stages of development and are often under-resourced considering the number of students and the labour market reality.

Recommendation: Increase involvement of regional employers in the design and delivery of study programmes.

The involvement of regional employers and other stakeholders in dovetailing study programmes to regional needs can take many forms: (i) participation in curricula reform, (ii) participation in lifelong learning strategies, (iii) involvement in teaching, especially in experiential and problem-based, and project-based learning, (iv) systematic internship collaboration.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none">• HEIs• Local and regional governments• Chamber of Commerce and other key economic development stakeholders• Regional Development Agency• Regional Employment Agency• MS Pact• Ministry of Education, Youth and Sports
An international example that could provide inspiration:	<i>World of Work at Liverpool John Moores University (UK)</i> (see Chapter 1)

Recommendation: Make internships and other work-based learning opportunities an entitlement for students.

Ideally internships should be an entitlement for all students. Internships need to be supported by HEIs in terms of (i) spreading information, since hosting organisations prefer to have single interlocutors which provide them access to several candidates and routine procedures, (ii) facilitating the supervision of interns, especially if related to academic requirements and co-tutorship arrangements, (iii) providing assistance to the intern during the internship, (iv) making sure that experience reports are prepared for the double purpose of reflecting about the learning experience off campus, and informing other students and teachers. Host organisations, in particular small and medium-sized firms, will welcome greater accompanying support as this reduces costs and resource allocation on their side.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • Regional Employment Agency • MS Pact • Ministry of Education, Youth and Sports
An international example that could provide inspiration:	<i>Excellence Tandems at the Beuth Hochschule in Berlin (DE)</i> <i>(see Chapter 1)</i>

The role of HEIs in research, innovation and development in the region³⁷

Framework conditions in the region for research, development and innovation (RDI) are mixed. The region is one of the few regions, which have a cluster policy framework in place, and since recently also a RIS3 strategy. Public HEIs in the region obtained a robust position in a number of technology niches. Nevertheless, the region ranks relatively low in the 2014 European Regional Innovation Scoreboard in terms of its RDI performance, belonging to the moderate performers within the group of low innovation regions, i.e. between the ranks 126 to 132 of 190 selected EU regions.

Also the Scimago international research ranking indicates a relatively modest R&D performance for the public universities in Moravia-Silesia in comparison with other universities in the country and neighbouring Poland. The Scimago ranking confirms increased activity international collaborations and a relatively good citation performance. However, funding from international sources, though increasing, is still marginal (about 4% of total national public funding in 2012 against 1% in 2003).

Developing a solid basis for RDI is a challenge for the HEIs in the region: they lack funding and critical mass. R&D outputs are produced by a small number of people who, often, work in separate research centres. The proportion of researchers in Moravia-Silesia's higher education sector is a little above the national average placing the region at the third rank in the country. The volume of (national) public funds allocated to public universities for R&D is low and the two small private HEIs have ambitions to transform themselves into research-based institutions but are developing their capacity from a low base and lack critical mass and R&D traditions. On the business side, R&D expenses are concentrated in a small number of large international corporations. The Science and Technology Park, which is a triple helix effort bringing together VSB-TUO and University of Ostrava as co-owners, is currently underutilised and lacks a science component, because there are no projects founded by university scientists.

Environmental challenges offer opportunities for research, development and innovation.

The city of Ostrava and the wider region suffer from high environmental stress. Some progress has been achieved over the years, for example, the water quality improved and one fifth of the territory is now protected area. Still, there is a continuous need to widen and enhance environmental protection measures and there is much underutilised RDI potential, which involves all HEIs in the region. Some responses already exist, however advanced by single HEIs and not the result of collaborative efforts.

³⁷ This section is a summary of Chapter 2 by Patrick Dubarle.

Recommendation: Encourage and reward HEIs to address regional challenges.

A proactive strategy, prioritising green growth and the protection of the environment, would transform a major drawback into a development advantage, and help the local economy to reinvent itself by connecting with new global trajectories. Such an approach requires greater mobilisation of all stakeholders for committed actions. This could for example be achieved by the creation of sustainable innovation labs which bring together research and development stakeholders in creative environments.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Alumni • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • MS Pact • Ministry of Education, Youth and Sports
International examples that could provide inspiration:	<p>Kitakyushu: how to build a green & vibrant city (JP) (see Chapter 2)</p> <p>Rotterdam University's Innovation Labs (NL) (see Chapter 2)</p>

Opportunities for increased HEI-Business collaboration

University-industry collaboration remains limited. A challenge for all HEIs in the region is that they lack strong multi-stakeholder partnerships.

Recommendation: Strengthen knowledge exchange through a common interface and increased mobility.

Interactions between HEIs and businesses, especially what concerns SMEs, are weak in the region. Innovation vouchers only had little effects and contract research is limited to the large international corporations. What HEIs offer seem to be not what is demanded by businesses in the region. Especially the RDI needs of SMEs in clusters seem to be unknown to HEIs. More systematic links are needed – increasing mobility between academia and business is a way to achieve this.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Alumni • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • MS Pact • Ministry of Education, Youth and Sports
An international example that could provide inspiration:	<p>Project Exchange at the University of Almeria (ES) (see Chapter 2)</p> <p>The Knowledge House – a collaborative network to support SMEs (UK) (see Chapter 2)</p>

Recommendation: *Attract talents and facilitate internationalisation of research activities in local firms and HEIs.*

The business sector in Moravia-Silesia has on average fewer researchers than other regions in the country. Partly this is due to sectors and the type of firms, but it is also difficult for firms to attract researchers, especially from abroad. HEIs have an important role to play in providing local players access to global knowledge networks and talents; HEIs can take on a magnet function for local clusters and firms. The increasing international R&D collaboration of the HEIs and efforts to attract international top researchers to the region should be sustained also from this point of view.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Alumni • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency
An international example that could provide inspiration:	ICREA –Catalan Institution for Research and Advanced Studies (ES) <i>(see Chapter 2)</i>

Recommendation: *Promote Erasmus for Young Entrepreneurs.*

Erasmus for Young Entrepreneurs is a cross-border exchange programme, which gives new and aspiring entrepreneurs the chance to learn for a couple of months from experienced entrepreneurs about running small businesses in another country. The Innovation Support Centre at VSB-TUO (CPI) could play a leading role in this. The involvement of students, from a very early stage on, will be important.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Alumni • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • MS Pact
International examples that could provide inspiration:	http://www.erasmus-entrepreneurs.eu/page.php?cid=9#.VAXyPiigyno <i>(see Chapter 4)</i>

Organising interdisciplinary and inter-institutional collaboration across HEIs is difficult

Moravia-Silesia and its HEIs have abundant potentials to foster inter-institutional and cross-disciplinary collaboration. There is not enough acknowledgement of the transformational role which social sciences and arts can play in regional and local development and in entrepreneurship. Throughout the region and internally amongst universities the division of university staff and students into different domains and study programmes/faculties, however, hinders the emergence of heterogenic student teams and of interdisciplinary research projects. The lack of focus on this area is partly due to national framework conditions, but also the lack of a strategic vision.

HEIs in the region, as elsewhere in the country, traditionally had only sporadic interdisciplinary collaboration across faculty boundaries. As a result, disciplinary thinking and silo approaches are common. However, there are signs of change as the recent emergence of multidisciplinary research

centres suggests. These new centres can help the change of mind-sets and introduce structures that are more conducive to research, development and innovation than single-discipline, single-institution and a mere focus on professors and researchers leaving apart students.

The three public universities aim at fully transforming themselves into research universities. They employ different approaches and mechanisms. Despite obvious complementarities, inter-institutional collaboration efforts remain limited. The potential for collaboration is overlooked and bottom-up initiatives for collaboration within universities are scant. Due to the difficulties of cooperation at the institutional level, initiative-taking is left to individual professors and researchers. Collaboration appears to be easier at international and national levels rather than within the region.

Recommendation: Promote a new strategy for innovation & excellence taking into account niche technologies and the region's cultural richness.

In the region's RIS3 strategy the emphasis is on technology sciences whereas environmental protection and the region's cultural richness are not prioritised. A rethinking of the strategy process, involving all HEIs, should happen, focusing on niche areas in line with the local labour market demand and the region's comparative advantages, taking full advantage of the cultural assets.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Alumni • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • Regional Employment Agency • MS Pact • Ministry of Education, Youth and Sports
An international example that could provide inspiration:	<p>The DRESDEN Concept "Dresden, Research and Education Synergies for the Development of Excellence and Novelty" (see Chapter 2)</p> <p>Performance contracts in Austria mobilise universities for regional RIS3 (see Chapter 5)</p>

Recommendation: Develop cooperation link with a third mission focus.

Strengthening co-operation between the public universities, possibly also involving the private HEIs, is a way to build critical mass in a number of research fields. This favours inter- and multidisciplinary in research and enhances the societal and local relevance of research.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • MS Pact
An international example that could provide inspiration:	<p>Research Consortium of Finnish Universities (FI) (see Chapter 2)</p>

Recommendation: Devote more efforts and funding to retaining talents in the region.

Brain drain is a major barrier to regional development. HEIs in the region should be encouraged and supported to develop projects that help retain alumni in the regional economy. This is not just about matching graduates with existing jobs, but also about creating new jobs through knowledge exchange.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Alumni • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • Regional Employment Agency • MS Pact • Ministry of Education, Youth and Sports
An international example that could provide inspiration:	<p><i>Fast Forward: Creating Opportunities for Graduates to Stay (NL) (see Chapter 2)</i></p> <p><i>The University Rovira i Virgili - a long-term commitment to the economic transformation and industry specialisation in Southern Catalonia (ES) (see Chapter 5)</i></p>

The role of HEIs in boosting entrepreneurship through education and start-up support³⁸

Moravia-Silesia has many reasons to boost entrepreneurship in HEIs through education and start-up support. The economic transformation challenge, the pressures on the environment and outward migration tendencies are pointing towards the need for more proactive and engaged HEIs.

Currently, the public universities in Moravia-Silesia have a weak focus on entrepreneurship. With the exception of the Ostrava Business School, entrepreneurship is understood as business administration or as “Finding and using opportunities” or “Trying to find the resources to exploit opportunities”. Teaching strategies, with regard to entrepreneurship, therefore focus on general principles of management, rather than on new venture creation.

Especially in local economies, which host more than one higher education institutions, economies-of-scale effects can matter for the result of entrepreneurship support offered by HEIs. Certain start-up support services, such as investment brokerage and incubation show greater results if offered to a major number of students and researchers and are likely to be less effective if organised individually by the higher education institutions.

In summary, there is a rich and diverse basis for innovation, entrepreneurship and third mission activities in the region, but some major obstacles that needs to be addressed.

³⁸ This section is a summary of Chapter 3 by Tomas Karlsson, and Chapter 4 by Jakob Stolt.

There is a lack of adequate structures in entrepreneurship education

Currently, the HEIs in Moravia-Silesia are not structured in a way that stimulates and supports the development of entrepreneurial mind-set and skills. Academic support for entrepreneurship is fairly weak across public HEIs. There are no professors dedicated to venture creation and research commercialisation with the exception of the recently introduced VSB-TUO technology scouts.

While some staff members may have an interest in entrepreneurship, there are no specific departments or organisational units that would have entrepreneurship as a primary focus. The absence of university positions in entrepreneurship and the lack of attention amongst academics have significant consequences. Engaging students to take interest in entrepreneurship becomes a challenge, support for students and staff who are interested in entrepreneurship becomes shallow and consulting oriented and research-based development of entrepreneurship curricula becomes scarce. There is no one who can spearhead developments and take-up rates remain low, confined only to students who are self-motivated to pursue an entrepreneurial career.

Stepping up the entrepreneurship education offer would require enhanced in-service training for staff or new external recruitment to ensure that staff is trained in current developments in entrepreneurial pedagogies and connected to international entrepreneurship research.

Recommendation: Build a long term robust focus on entrepreneurship and innovation by creating academic positions, which develop related research, education and knowledge exchange through constant interaction and shared learning with international research community.

One way of developing adequate structures to stepping up the entrepreneurship education could be through investing in dedicated chairs. The HEIs, if possible in collaboration, could consider creating two endowed chairs and fill these positions through an open international competition. The focus areas of the chair in entrepreneurship could include: venture creation activities, development of entrepreneurship research and education programmes, contribution to the development of the business incubator. The focus areas of the chair in innovation could include: matching university research results with venture capital and entrepreneurs, developing the research agenda in innovation and technology commercialisation, contributing to the development of the science park and raising external funding from the EU and national sources to develop innovations from faculty inventions.

In order to build broad-based research competences in these fields, HEIs in the region could develop a joint high profile internationally active doctoral programme in entrepreneurship and innovation for PhD students with international experience and/or background. Research and learning programmes should be continuously updated through constant interaction with the international research community in entrepreneurship education and research.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Alumni • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • MS Pact • Ministry of Education, Youth and Sports
An international example that could provide inspiration:	Lund University (SE) (see Chapter 3)

Teaching and learning do not support entrepreneurship and innovation

Effective entrepreneurship education requires pedagogies, which stimulate critical thinking and creativity. They need to go beyond the classical chalk-and-talk frontal teaching approaches, involving student-centred activities, problem-based and experimental learning, and gaining of practical experience, which is incorporated into learning in classroom. The key is to enhance the student's ability to think and respond entrepreneurially.

Current approaches to teaching and learning in Moravia-Silesia's HEIs, with some exceptions amongst the younger faculty, do, however, not meet these requirements. The current pedagogy is dominated by traditional teaching methods such as labs and large scale lectures, while exams focus on declarative skills. There are isolated examples of the use of case studies, games and simulations. Despite the current modest performance in entrepreneurship education, HEIs in Moravia-Silesia are gradually building the basis for more concrete action. The key university in the region, VSB-TUO has developed extra-curricular activities which help develop entrepreneurial mind-set amongst students. These activities include the Green Light competition and accelerator, both hosted by the VSB-TUO.

Recommendation: Engage in pedagogical reform, revising and modernising the learning goals of courses.

HEIs in Moravia-Silesia should prepare for a profound pedagogical reform. This may require the development of new instructive pedagogies, and grading assignments.

A concrete step forward would be the creation of a working group responsible for the pedagogical reform, with a mandate to benchmark with international good practice. New requirements should be initiated on course and programme plans, which should have clear functional goals (skills and experiences), in addition to declarative goals (written tests). The course and programme plans should be constructively aligned with actual pedagogies.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Alumni • Ministry of Education, Youth and Sports
An international example that could provide inspiration:	Aalborg University (DK) (see Chapter 3)

Students remain an underutilised resource in education extracurricular activities and R&D

HEIs in Moravia-Silesia offer students limited opportunities for experiential learning, self-managed learning, student-led lecturing, teaching led by entrepreneurs, problem-based learning, or

reflective exercises. Students have limited opportunities to influence instruction, content, courses offered and examination of classes. The acquisition of functional skills and soft skills is limited as noted above. Some students in bigger institutions perceive that universities have a lack of focus on individual student's progression and employment, but only deal with masses.

Students in Moravia-Silesia are an underutilised resource in education activities, R&D and extracurricular activities. Interviews with students revealed untapped potential for student engagement in the institutional development of the universities. Examples of areas where students could play a more meaningful role include third mission activities, student support activities, internationalisation, educational development and research.

Students could also facilitate the collaboration and development of small businesses in the region. While SMEs may lack resources to pay for university services, they provide excellent training and learning opportunities for students. Small businesses often need/want to develop the management and the organisational set-up, which is where students can contribute. Also development problems in SMEs are less complex, and it is easier to get access to and time with the top management.

Recommendation: Increase student-centred learning through problem-based learning and flipped classroom models. Consider also the introduction of Massive Open Online Courses to make more efficient use of faculty time and to avoid pedagogical challenges of mass lecturing.

HEIs that struggle with high dropout rates and the decrease in per-student public funding need to find innovative ways to develop student-centred learning environments. Different approaches can be taken.

One is to pre-record lectures and let students watch them on their own on school computers. Recorded classes save the staff time spent on preparation of lectures which can instead be used in workshops on the topic. Recorded lectures must be supported by regular integrated workshops and labs to audit that the knowledge is translated into practice.

A second approach could be to integrate massive open online courses into regular degree programmes using staff for group discussions and personalised mentoring. Ideally, faculty will soon become comfortable enough to produce fast online instructional content as a substitute of their traditional lectures. The advantage of online content is that students can repeat content as often as they want to (rather than just having one chance to listen to a lecture).

A third approach is to engage students to grade other students. The teacher's task is to base the assessment on the student examiner's judgment, and on their own. This leads to more expedient grading and added learning opportunities for students. Grading must be evaluated and judged by the responsible examiner, and grading templates need to be extensive.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Ministry of Education, Youth and Sports
An international example that could provide inspiration:	Student centred learning at Maastricht University (NL) (see Chapter 3)

Recommendation: Mobilise students for enterprise and strategic HEI development.

Student involvement is essential for developing a vibrant campus life. Student association activities can develop students' entrepreneurial abilities and improve the on-campus services including student canteen and cafes, language development, study support and international exchange. Students can also conduct assignments in association with small and large firms, and they can also drive entrepreneurial change at the university.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none">• HEIs• Ministry of Education, Youth and Sports
An international example that could provide inspiration:	Aaltoes – students promoting entrepreneurship (FIN) (see Chapter 3)

Recommendation: Promote students as innovation resource for local companies.

A closer collaboration between HEIs and local businesses that draws on students as real resources for innovation and business development is a way of strengthening the students' ability to combine their theoretical knowledge with practical experience. At the same time, mobilising students to provide practical contribution to local SME development will improve the HEIs' linkages with the surrounding small business community. These collaborations could be carried out as student projects, student employees and innovation workshops – all with a strong focus on implementation and execution rather than only on analysis and reflection.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none">• HEIs• Alumni• Local and regional governments• Chamber of Commerce and other key economic development stakeholders• Regional Development Agency• MS Pact• Ministry of Education, Youth and Sports
An international example that could provide inspiration:	Students as innovation resource in Sweden: Host company work at Jönköping International Business School (SE) (see Chapter 3)

Recommendation: Facilitate student participation in research and its commercialisation.

Interaction between engineers and entrepreneurs is central for a knowledge-based economy. VSB-TUO offers the modern facilities of the incubator and a concentration of excellent faculty and engineers, but lacks entrepreneurs who are trained according to the latest entrepreneurial theories. Ostrava Business School trains entrepreneurs based on the latest entrepreneurial theories, but lacks technological understanding and research connections. There are more examples of cross-HEI collaboration, which should be reviewed for their feasibility. Interdisciplinary activities for students and inter-HEI collaboration would also increase the third mission activities of HEIs, enable them to play a leading role in the region's economic restructuring and growth, create success stories, and ensure that the research developed in HEIs comes into commercial use for the big public.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Alumni • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • MS Pact
An international example that could provide inspiration:	<i>Students boosting the commercialisation of research results at Chalmers School of Entrepreneurship (SE)</i> <i>(see Chapter 4)</i>

Recommendation: Focus entrepreneurship education activities on regional challenges and opportunities.

Environmental management, pollution and health impacts, social cohesion, geriatrics and technical assistance to the aging population, clean mining, material research, family business management and entrepreneurship, industrial change and computer engineering are some of the areas where HEIs could play a leading role.

The HEIs should consider a focus on social entrepreneurship; in particular the Silesian University Faculty in Karvina, but also others. This would involve the hiring of educators or PhD candidates with this specialty. Social entrepreneurship could also be a focus for the VSS College for Social and Administrative Affairs in Havírov, whose origin has been in training medical professionals and social workers.

In general, social entrepreneurship can be a lever for promoting entrepreneurship in Moravia-Silesia's HEIs. Social challenges and change tend to have the youth's attention. It is often easier for many students to identify themselves as social entrepreneurs or change agents in a local setting than as "big time" entrepreneurs, creating the next million-dollar-winning product or service.

Municipalities, local and regional governments could regularly open a "Call for Social Solutions", involving a wide range of stakeholders, in search of innovative, bottom-up solutions some of the region's key challenges. One way of implementing a social entrepreneurship project in higher education is replacing traditional exams by an enterprise project in the social sector, such as, for example, organising a charity event.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • MS Pact
An international example that could provide inspiration:	<i>Organising a charity event instead of sitting an exam at Dublin Institute of Technology (IE)</i> <i>(see Chapter 4)</i>

Recommendation: Increase the attention on business development and succession issues for family businesses.

Family businesses that emerged after 1990 have contributed to entrepreneurial drive of the region as transition pioneers spearheading development in new sectors. Many of these firms are now approaching a major change – business succession. Implementing business succession in family firms requires special techniques and communication, maintaining an entrepreneurial spirit across generations of family leaders. The leadership change must be made when both junior and senior generations are ready for their respective roles of handing and taking over the firm's leadership. Professional education and higher education can both play an important role in this.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Alumni • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • MS Pact
International examples that could provide inspiration:	www.trustedfamily.net/about/ (see Chapter 4)

Start-ups lack fundamental business support provision

There is not enough fundamental start-up support throughout the region with exception of isolated initiatives that lack impact and sustainability. Some HEIs have developed elements of student start-up support. On their own these initiatives, however, lack critical mass, quantity and quality, and sustainability.

There seem to be no support measures for those new firms that are not located in incubation facilities, which means that a high number of new businesses and companies wanting to grow/expand do not have formal access to support and guidance in a formalised manner. There is a lack of local, regional or national schemes that provide fundamental seed money for start-ups. Also lacking is non-financial support, such as help and/or guidance regarding legal aspects, proof-of-concept, sales, forming of teams, access to networks etc. These services are offered only for firms located in the regional business incubators and the technological park.

Recommendation: Develop an easily accessible system of fundamental business start-up support.

The present system of business support does not provide specific and tailored support for academic start-ups. There are no easy access points. When start-up support is shared and delivered in multiple locations, the region can optimise the use of common resources, while not taking up too many resources from the involved stakeholders. On the other hand, if would-be-entrepreneurs do not know what to do or where to go, the motivation can soon be destroyed, as the way to get things going seems hopelessly long and burdensome.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Alumni • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency • Regional Employment Agency

	<ul style="list-style-type: none"> • MS Pact • Ministry of Education, Youth and Sports
An international example that could provide inspiration:	Copenhagen School of Entrepreneurship, CSE (DK) (see Chapter 4) Gate to Create – the power of entrepreneurial student organisations (DK) (see Chapter 4)

Recommendation: Increase accessibility and effectiveness of incubation services.

Incubation facilities in the region should be open to students, researchers and alumni, who would like to start-up a business, regardless of their HEI affiliation. Enable the incubator to offer office space (for example in the vacant space in the Science Park), and run large-scale market campaigns to raise interest in locating in the incubator. Consider providing student associations with funding incentives to scale up the incubator work and reach out to larger numbers of potential tenants. One possibility could be to have student-run canteen or café services.

Follow-up:	
Recommendation to be discussed by:	<ul style="list-style-type: none"> • HEIs • Alumni • Local and regional governments • Chamber of Commerce and other key economic development stakeholders • Regional Development Agency
An international example that could provide inspiration:	“Smart Guide to Innovation-Based Incubators” http://ec.europa.eu/regional_policy/source/docoffic/2007/working/innovation_incubator.pdf (see Chapter 4)

Recommendation: Promote the visibility of student and alumni start-ups.

Starting one's own company or taking over an existing firm are not sufficiently exposed as career options to students – neither in study programmes, nor by HEI leadership or faculty members. There is a lack of visible student start-ups that could provide role models for other students. The few student start-ups existing are more engaged in their business development than taking on a role-model function, and the HEIs are in early stages of developing mechanisms to reward and showcase these examples.

National framework conditions and institutional effects³⁹

In Moravia-Silesia, the rapid expansion in higher education student enrolments has now levelled off, and the HEIs need to diversify their funding streams by building their R&D capabilities and stronger linkages with the local industry. The reasons for the above mentioned lack of focus on student-centred learning are linked to the national policy framework. Cuts in education budgets have led to increasing class sizes which do not facilitate student-centred learning approaches. There are

³⁹ This section is a summary of Chapter 5 by Jaana Puuka.

currently no dedicated pedagogical support centres or quality teaching centres in Moravia-Silesia's HEIs which could drive pedagogical reform.

The Czech Government has in recent years embarked on a number of initiatives to reform the country's higher education system, but so far profound changes have not been made.

Limited external influence in HEI governance

Public universities in the region, as elsewhere in the country, have robust academic self-governance with a low level of direct involvement of external stakeholders. While the inclusion of external members forms an important part of the accountability of autonomous HEIs towards external and internal stakeholders and society at large, the Czech higher education act does not require stakeholder involvement in the Academic Senate. The establishment of the HEIs Boards of Trustees has introduced external stakeholders into internal governance but these boards play only a limited advisory role. As a result, industry involvement in curriculum design and implementation, educational processes or research activities is limited and the choice of the study programmes and their contents are more supply-driven than reflecting or stimulating labour market demands.

Limited ability to launch HEI-wide reforms

The Czech higher education system is characterised by limited institutional capacity in strategic decision making, challenges in the prioritisation of activities and a general difficulty in creating financial headroom for new strategic openings. Important functions remain under-resourced or are at early stages of development, often boosted by external funds, particularly from the European Union. Rectors have the formal responsibility for their universities, but their ability to exercise effective leadership is limited. In order for the decentralised matrix organisation to function well in HEIs and to boost organisational change, each component of the organisation would need to be complicit in its role and responsibilities within the whole.

While the current system incentivises activities at the individual and faculty level, it also reduces the ability to pursue and implement university-wide reforms, such as for example the introduction of interdisciplinary programmes – open to all students – because independent faculties may be less inclined to consider inter-faculty co-operation or the functioning of the HEI as a whole. Similarly, such a decentralised institutional governance system also contributes to the lack of strategic collaboration between HEIs.

The Ministry of Education, Youth and Sport (MEYS) exercises its strategic leadership in the higher education system mainly through five-year strategic plans, the current one covering the period of 2011-2015. Each individual public HEI is then required to elaborate its own development strategy for the same period. These strategies are annually updated which, in principle, would provide an opportunity to respond to new development trends and needs. The fact that the institutional funding is defined only on an annual basis does not provide strong enough incentives for HEIs to modernise themselves or to engage in novel ways of resource allocation based on (long-term) priorities for organisational change.

Public funding

Public HEIs in the country receive an annual funding which is predominantly based on student numbers. In 2013, about 77.5% of a HEI's funding is based on numbers of students, 22.5% on performance criteria. The formula is different for bachelors, masters and doctoral degrees with a progressively higher weight of the performance criteria at doctoral degrees (only the standard length of

a study programme plus 1 year is taken into account). As for 2013, the graduation rate or number of graduates is not included in the formula. HEIs receive a certain number of funded study places per year, i.e. the limit number of students. If an HEI takes in more students it will receive only the funding equal to its limited number of students; if it takes in less, there is a bonus.

The high degree of faculty autonomy in Czech public HEIs has led to a tendency to limit the central university resources in favour of maximising faculty income and topping up the academic staff salaries.

Budget allocation within public HEIs follows the where it is “earned” approach; a modest overhead is collected to support central services. Such a decentralised budget allocation system includes opportunities and challenges for institutional development and change. It can incentivise income generation and competition but it can also lead to institutional fragmentation and hinder institution-wide development initiatives. It also poses risks related to financial and reputation management which are related to national and increasingly EU legislation.

The system of decentralised governance also means that the faculties are in charge of the staff recruitment, development and remuneration. This can provide financial incentives for those academics who can supplement their capped salaries by taking on industry collaboration or additional employment in private universities.

Currently, the public HEIs in Moravia-Silesia are each at early stages of developing internal processes capable of knitting the different strategic agendas together, and the progress in developing important central services and functions remains uneven. While the situation varies from one institution to another, typically under-resourced functions and services include: students’ career centres, knowledge transfer and industry collaboration, entrepreneurship support, support for language learning and internationalisation, student’s academic and social support, quality assurance and support for quality teaching, new modes of learning, and lifelong learning.

R&D funding and evaluation system

The current R&D funding policy in the country drives a uniform HE system where all public HEIs need to compete for research funding, otherwise they will lose not only other funding but also the accreditation of study programmes in the fields in which research outputs cannot be demonstrated.

About 40% of the funding, the Institutional Funding, is allocated to public HEIs on the basis of the “Evaluation Methodology”. The Evaluation Methodology is essentially a one-size-fits-all approach which treats all public HEIs in the same way, against the goal of developing mission diversity. This has many unintended effects for HEIs and individual researchers. Output-focused evaluation discourages demand-led R&D because it measures the immediate research outputs rather than the societal impact or usefulness of the research. It favours basic sciences, but punishes social sciences and humanities as well as applied, innovation and local development relevant research activities. Instead, the approach encourages opportunistic behaviour of researchers. Long articles are split into smaller ones, patents are broken down into utility models and academics use their connections to influence or shape the boards of journals etc.

Limitations in the career system

Czech HEIs are in principle highly autonomous in staffing matters and only the appointment of some senior academic staff members in public universities must be confirmed by an external authority. In practice, however, HEIs’ are constrained by the current academic qualifications and career system

(as Chapter 5 explains). Attraction and motivation of academic staff is complicated. For example, staff members of the University of Ostrava have predominantly pedagogical faculty careers with limited tradition in R&D. Private HEIs face also difficulties. Ostrava Business School reports challenges in attracting educators with the academic qualifications required by the national accreditation system.

Accreditation system

The Accreditation Commission plays an important steering and monitoring role in the country's HE system. The Commission has wide authorities in terms of programme accreditation, the shape of the HE system, internal structure of the universities and the academic qualification and career system. This limits the agility and ability of the HEIs to create their learning programmes.

Private sector representation in the Accreditation Commission is limited. Out of the 21 members of the Accreditation Commission, 15 are academics from public Czech HEIs, two members are from Academy of Science with part-time appointments at universities, and two are academics from abroad. Permanent and special working groups, organised by disciplinary groupings support the work of the Accreditation Commission.

As discussed in Chapter 5, the current accreditation system drives a uniform education provision focusing on academically oriented study programmes rather than programmes that are labour market relevant, interdisciplinary or supportive of entrepreneurship. The current system also determines the mode of delivery of study programmes (including contact hours) and thereby reduces the HEIs' flexibility to take advantage of new and experiential modes of learning. The review concludes that the current accreditation system is not fit for purpose and requires reform.

The following recommendations are proposed for national government, local and regional governments, and HEIs. A full presentation and examples of relevant international good practice can be found in Chapter 5.

Recommendations for national government

- Continue the efforts to reform the higher education legislation and the higher education system.
- Provide incentives for HEIs to play an active role in regional innovation, human capital development and community engagement.
- Consider introducing a national level funding mechanism to support university business and community engagement and entrepreneurial activities.
- Provide incentives for HEIs to play an active part in the smart specialisation process.
- Consider mobilising private funding for HEIs including charitable donations, trusts and alumni.
- Encourage collaboration between HEIs to improve the supply and demand of HE/research training provision.
- In the allocation of research funding, replace the Evaluation Methodology by a system of performance contracts with both prospective and retrospective components, supported by objective indicators and international peer review.
- Consider distinguishing the quality assurance for improvement purposes from the quality assurance for accreditation.
- In anticipation of a more profound reform of the quality assurance system, tweak the quality assurance system to ensure fitness for purpose and greater labour market relevance.
- Take steps to develop a more diverse academic career structure on the basis of a tenure system,

rather than the existing system of habilitation.

Recommendations for local and regional governments

- Consider the establishment of a special regional investment fund.
- Work with the universities in preparing an integrated regional and local place-based strategy.
- Ensure that HEIs have a strong voice on the committees established to shape and oversee the implementation of the new round of the European Structural Funds and clarify the roles of different institutions in the regional innovation system.
- Improve the capacity for local and regional engagement amongst key public and private stakeholders and higher education institutions through forums for communication and programmes where good practices can be fostered and through targeted training programmes with focus on practical problem solving.
- Invest jointly with higher education institutions in programmes that bring benefit to regional businesses and community, for example translational research facilities which are aligned with the needs and opportunities of the region, advisory services for SMEs, professional development programmes, capacity building programmes for public and third sector employees, graduate retention and talent attraction programmes.

Recommendations for HEIs

- Address the challenges of shrinking age cohorts by lowering the institutional costs structures, introducing a more strategic approach into the internal funding allocation and diversifying funding streams to lifelong learning activities, entrepreneurial activities, collaborative research with industry and national and EU grants.
- Choose to focus on some areas of activities on the basis of the identification of institutional strengths and the needs of the region and the society at large.
- Depending on the institutional profile, identify civic and/or industry engagement as part of the university's mission.
- Complement the decentralised budgetary system with a clear strategic planning framework.
- Review recruitment, hiring and reward systems to include regional development agenda and entrepreneurial activities.

ANNEX

About the contributors

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Patrick Dubarle is a graduate from the French “Ecole des Mines” (Nancy), and he holds a Master’s degree in Economics from the University of Paris Sorbonne. He joined the OECD in 1978 as a junior administrator in the Directorate for Science Technology and Industry and worked on industrial structures issues and innovation policies. He is the author of documents on high tech policies and sectorial questions including OECD reports on space industry (Trade related issues), advanced materials (Government Policy and Technological Change) and technology fusion (a Path to Innovation, the Case of Optoelectronics). He was appointed Secretary of the Working Party on regional development policies in 1992 and was then responsible for country regional policy reviews and horizontal programmes. In 1995 he became Principal Administrator at the OECD Public Governance and Territorial Development Directorate. Since the beginning of the last decade, he coordinated or contributed to more than 15 territorial reviews at the national and regional level. He was also in charge of a programme on Higher Education and Region and within this framework he provided expertise for ten case studies in Member and non-Member countries. He has worked with national governments in many OECD countries and has spoken at several international conferences. He left the OECD secretariat in 2008 and is now an independent international consultant working for international organisations such as the World Bank, the OECD and the European Investment Bank (EIB) as well as an expert for the Hungarian Government. He notably worked for the French Regional Development Agency (DATAR) on a programme on best practices in regional development policies in Brazil, China, Korea and the US. He was recently involved in several OECD urban reviews (Korea, Kitakyushu, Stockholm, Antofagasta and Krasnoyarsk).

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Jaana Puukka is a strategy consultant and international expert in higher education with focus on modernisation of higher education, innovation and entrepreneurship. She is the Founder and President of Innovation Engage, and a former OECD Analyst and Project Manager. She is also a Senior Policy Fellow for Conseils sans Frontières and a CONAHEC associate for the consortium for North American Higher Education Collaboration. She is currently the External Expert for the European Commission on Modernisation of Higher Education and Universities' role in regional smart specialisation process. She also collaborates with the Council of Europe, World Bank and the Association of University Research Parks. Puukka has nearly 20 year experience in higher education management, evaluation and expert positions at international, national and institutional level. Puukka established Innovation Engage in 2013 after eight years in the OECD where she worked to reform and modernise the global HE sector. Her work on the Reviews of HE in Regional and City Development has made a significant contribution to the development of the global knowledge base of entrepreneurial universities, entrepreneurship education, higher education management and modernisation of higher education. She has collaborated with hundreds of universities in 35 cities or regions in close to 25 countries in Europe, North and South America, Asia, Australia and Africa, and co-authored and edited a range of publications including the flagship publication "Higher Education in Regions - Globally Competitive, Locally Engaged" (OECD, 2012). Puukka joined the OECD from Finland where she held various management, expert and advisory positions in HEIs, collaborating with the national and local governments and the private sector for over ten years.

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Jakob Stolt is Senior Adviser at Aalborg University, Denmark, at the department AAU Innovation with the responsibility of innovation and entrepreneurship as an integrated part of the work at the university. A leitmotiv in his work is creating relations, that is, common goals for an enhanced effort within entrepreneurship and innovation with relevant partners. Prior to this Jakob was a partner in a course and publishing firm, later working at Copenhagen Business School, then Regional Director at International Danish Entrepreneurship Academy (IDEA), and as Director of Øresund Entrepreneurship as a true practitioner building on his Master in Leadership and Innovation in Complex Systems (LAICS). Jakob has edited and published two anthologies about entrepreneurship education and done reviews of universities' efforts within entrepreneurship as part of several OECD-projects. Jakob works at Aalborg University Copenhagen campus, recently relocated in the former Nokia buildings at the Copenhagen harbour front, focusing especially on the university's co-location for co-creation ambitions for getting students, researchers and businesses to live literally door-to-door taking advantage of knowledge and synergies to enhance development and knowledge sharing amongst the stakeholders.

Interview partner during the study visit 18-22 November 2013

Bardoňová	Zuzana	Regional Development Agency
Bartoš	Pavel	Development Union
Bečica	Jiří	College of Social and Administrative Affairs, Havířov
Beck	Vojtěch	College of Social and Administrative Affairs, Havířov
Beneš	Jan	Development Union
Bernatík	Werner	Silesian University in Opava
Blecharz	Pavel	VŠB-Technical University of Ostrava
Bracháčková	Silvie	VŠB-Technical University of Ostrava
Buganský	Libor	Labour Office Ostrava
Čapský	Martin	Silesian University in Opava
Červinka	Michal	Ostrava Business School plc, VŠP
Chovanioková	Petra	Regional Development Agency
Cienciala	Jiří	Ostrava Business School plc, VŠP
Čížková	Helena	Ministry of Foreign Affairs
Czekaj	Petr	Development Union
Dluhošová	Radmila	Silesian University in Opava
Duda	Martin	VŠB-Technical University of Ostrava
Durda	Lukáš	Ostrava Business School plc, VŠP
Engliš	Miroslav	Silesian University in Opava
Fabián	Ján	Development Union
Fiala	Josef	College of Social and Administrative Affairs, Havířov
Formánek	Ivo	Ostrava Business School plc, VŠP
Gottvald	Jaromír	VŠB-Technical University of Ostrava
Habrmanová	Magda	Chamber of Commerce
Hodula	Zdeněk	VŠB-Technical University of Ostrava
Humeňanská	Hana	Labour Office Ostrava
Huvarová	Kateřina	Development Union
Jakob	Radek	Regional Development Agency
Jirásek	Zdeněk	Local Government
Jünger	Radan	Ostrava Business School plc, VŠP
Kajnar	Petr	Local Government
Karásek	Zdeněk	Development Union
Kašík	Josef	VŠB-Technical University of Ostrava
Kauerová	Lenka	VŠB-Technical University of Ostrava
Kebo	Vladimír	VŠB-Technical University of Ostrava
Kolář	Petr	Jan Amos Komensky University Prague
Kotátko	Zdeněk	Development Union
Kozák	Ladislav	Chamber of Commerce
Krajčík	Vladimír	Ostrava Business School plc, VŠP
Kulháněk	Lumír	College of Social and Administrative Affairs, Havířov
Lenčo	Libor	Regional Government
Majerova	Ingrid	Silesian University in Opava
Mariánek	Petr	Labour Office Ostrava

Michalec	Roman	Science and Technology Park Ostrava
Mikoláš	Zdeněk	Ostrava Business School plc, VŠP
Močkoř	Jiří	University of Ostrava
Nešporková	Renáta	Ostrava Business School plc, VŠP
Noskievič	Petr	VŠB-Technical University of Ostrava
Palková	Věra	Regional Government
Pavlačková	Martina	College of Social and Administrative Affairs, Havířov
Pavlík	Jan	VŠB-Technical University of Ostrava
Pawlas	Daniel	Local Government
Peterková	Jindra	VŠB-Technical University of Ostrava
Petříková	Růžena	Ostrava Business School plc, VŠP
Piskořová	Vladana	Labour Office Ostrava
Pobucký	Michal	Local Government
Raszyk	Lukáš	Local Government
Šigut	Jaroslav	College of Social and Administrative Affairs, Havířov
Skipala	Jan	Chamber of Commerce, Ostrava Business School plc, VŠP
Skokan	Karel	Silesian University in Opava
Sláma	Michal	VŠB-Technical University of Ostrava
Smítal	Jaroslav	Silesian University in Opava
Špornová	Petra	Regional Government
Stavárek	Daniel	Silesian University in Opava
Štěpán	Jiří	Regional Development Agency
Stoch	Milan	Ostrava Business School plc, VŠP
Stoklasa	Michal	Silesian University in Opava
Strnadel	Bohumír	VŠB-Technical University of Ostrava
Sventek	David	Regional Government
Tesař	Vlastimil	Ministry of Foreign Affairs
Tóth	Andrej	Silesian University in Opava
Tvrdoň	Michal	Silesian University in Opava
Vaněk	Jindřich	Silesian University in Opava
Varadzin	František	College of Social and Administrative Affairs, Havířov
Vavrečka	Vladimír	Ostrava Business School plc, VŠP
Vondrák	Ivo	VŠB-Technical University of Ostrava
Vymětal	Dominik	Silesian University in Opava
Wagnerová	Eva	College of Social and Administrative Affairs, Havířov
Žáček	Rudolf	Silesian University in Opava
Zamarský	Vítězslav	Ostrava Business School plc, VŠP
Žiška	Pavel	Regional Development Agency
Žižka	Ivo	Development Union

In all five higher education institutions 1.5 hour focus groups were conducted with students (Bachelor, Master, Diploma and PhD students), alumni, and representatives of start-ups. These focus groups involved between 10-12 participants; names were not recorded.