Interdisciplinarity in Social Sciences:
Does It Provide Answers to Current Challenges in Higher Education and Research?

Edited by
Tatjana Muravska, Žaneta Ozoliņa

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University of Latvia Press

UDK 378.4
In 720

Contributing authors: *Alexandre Berlin, Zane Cunska, Manfred J. Holler, Guna Japiņa, Sylvain Jouhette, Roswitha M. King, Juris Krūmiņš, Ilona Kunda, Iasonas Lamprianou, Kristīne Medne, Indriķis Muižnieks, Nils Muižnieks, Tatjana Muravska, Žaneta Ozoliņa, Romāns Putāns, Fernando Reis, Inna Šteinbuka, Anete Vītola, Zane Zeibote.* **Interdisciplinarity in Social Sciences: Does it Provide Answers to Current Challenges in Higher Education and Research?**
Riga, University of Latvia Press, 2011, p. 232, il.

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The publication of this book was supported by:

EUROPEAN COMMISSION
REPRESENTATION IN LATVIA

LATVIJAS UNIVERSITĀTE
ANNO 1919 UNIVERSITY OF LATVIA

Layout **Andra Liepiņa**
Cover design **Agris Dzilna**
Proof reader **Denīze Ponomarjova**

ISBN 978-9984-45-433-7

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Acknowledgement

The study of interdisciplinarity "manifestations" in education and science could not occur without support from different disciplines and experts from a diversity of scientific fields. The publication of this book is the appropriate tribute to thank the supporters of this project.

First of all, we would like to express our deepest gratitude to the leadership of the University of Latvia. They counted on the potential of this study to provide a shared basis to understand the new trends in EU higher education and research and to respond to the demands of a modern knowledge-based economy. Both the Vice-rector for Research Indriķis Muižnieks, and the former Vice-rector for Academic Studies Juris Krūmiņš, contributed their ideas, critique and articles and also supported formally this publication.

Professors and researchers from different faculties within the University of Latvia, experts from the European Commission, including *Eurostat*, and from partner universities in the EU as well as young researchers have been engaged in the preparation of the publication.

This publication would not have been possible without support from the European Commission Representation in Latvia; we would like furthermore to express our gratitude for offering invaluable intellectual advise to explore the interdisciplinary diversity in Latvia and European Union. The publication of this book in Latvian and English enables the promotion and popularization of this subject in Latvia and beyond.

Finally, we would like to express our special gratitude to all of the contributing authors who have enriched the debate on the role of interdisciplinarity in education and science, allowing to explore the potential complications that inevitably arise when expanding the borders of ones owns' discipline.

Our special thanks are due to Kristīne Medne for her relentless enthusiasm and intellectual contributions to this project and the resulting publication.

Preface

The very nature of interdisciplinarity, as we understand it, requires that those who engage in it will always be working beyond the edges of what they know how to do well; in conception and methodology, such work cannot become conventional."[1]

Interdisciplinarity has become a very commonly heard buzz-word in the field of social studies and research. This phenomenon gives raise to a vast spectrum of attitudes, which vary from glorification to scepticism and negation.

The many different and often contradictory views on interdisciplinary education and research are the evidence that current approaches to global challenges cannot occur in the framework of one scientific discipline; scholars have to make very complicated choices.

The desire to ensure one's methodological purity and safeguarding against the possible impact of methodologies from other disciplines, can ultimately lead to isolation from outside knowledge and cooperation, and thus inhibit the promotion of one's own ideas. At the same time, if interdisciplinarity is not critical and is based on the commonly followed methodological model, rather than critical analysis, this could result in the dissolution of the one's own discipline and the ability of gaining knowledge objectively, thus loosing credibility. Independently of the positions taken by various representatives of the academic community, it is essential to discuss the role of interdisciplinarity in education and scientific research.

In order to respond to the demands of a modern knowledge-based economy, Europe needs more highly skilled graduates. These individuals must be equipped not only with specific subject knowledge and competencies, but also with a number of generic competencies and crosscutting skills, such as

[1] Dalke, A., Grobstein, P., McCormack, E. (2004), *Theorizing Interdisciplinarity: The Evolution of New Academic and Intellectual Communities.* Available at: http://serendip.brynmawr.edu/local/scisoc/theorizing.html

communication, flexibility and an entrepreneurial spirit. These skills and competencies will allow graduates to succeed in today's labour market.

Education and training in our societies have the paradoxical aim of preparing students to perform very specific and complex tasks while at the same time thinking critically, participating in discussions, and working with multiple sources and great amount of different information. Today's employers in the public and private sectors look for individuals who can identify issues, solve problems and take initiatives. As the complexity of our world increases, an ever-higher level of skills and knowledge will be needed to manage this complexity. Interdisciplinarity is a valuable tool in decision-making process and for analyzing different policy options.

In the last two decades, interdisciplinary thinking has moved up on the policy agenda in the EU and international organizations such as the OECD, World Bank as well as in many advanced knowledge nations.

Society, politics and economics of the 21st century can be described by key words such as interdependence and interaction of various processes, a clear indication that the problems of society are increasingly complex and interdependent. They are not isolated to particular disciplines, and they are not predictable. Reality is a nexus of interrelated phenomena, which are not reducible to a single dimension.

In Latvia, just as in any EU Member State, discussion is taking place on what will be the scientific response to the Grand Challenges? This discussion is the result of increasing pressure, and suggested solutions to come from both scientists as well as politicians who are expected to provide objective and evidence-based decisions.

The social sciences have become the area where the most ardent and ongoing debate occurs regarding the meaning and importance of interdisciplinarity and its role in the "Scientific Society", as well as of "Science in Society". In Latvia, this discussion has started relatively recently and it is mostly concentrated in a few small research groups reflected in some publications in books and journals. This book, "Interdisciplinarity in Social Sciences: Does It Provide Answers to Current Challenges in Higher Education and Research?" is an important contribution to this debate, suggesting a redirection away from the fragmented nature of interdisciplinary research; it offers the views of academia, researchers and practitioners from a variety of disciplines, some coming from different generations and countries. Many hold views, which illustrate important clashes of different opinions that occur in this debate on themes such as: education and training research, demographics, health, innovation, competitiveness and the political process.

Tatjana Muravska
Žaneta Ozoliņa

Foreword

I am very honoured that Professor Dr. Tatjana Muravska requested me on behalf of the editors, to write the foreword to the publication on interdisciplinarity in sciences. Such a question of interdisciplinary approaches lies at the heart of our European policies in general and in the Jean Monnet programme in particular.

So, what is the meaning of this concept of 'interdisciplinarity'? For me, interdisciplinarity includes dialogue and exchange of knowledge, analysis and methods between two or more disciplines. It implies interaction between several specialists and their mutual enrichment. It is an approach which aims to understand complexity by seeking to connect different methods and bodies in order to foster a holistic approach to thinking and problem-solving. Interdisciplinarity does not involve mastering several disciplines, but opening up to a variety of scientific disciplines in order to tackle one theme from different perspectives.

In our complex world, if we want to cope with the high quality requirements of the modern society, we have to abandon once for all the habit of compartmentalising. Interdisciplinarity teaches our students to think in a contextual and global way as a basis for drawing concrete conclusions.

Young people will be the first to benefit from the opportunities that interdisciplinarity offers. For example, current unemployment rates do not necessarily mean that there are no vacant posts available on the labour market: in many cases it means a mismatch between offer and demand. It will be important to develop, with the support of the European Commission, partnerships between innovation, research and industries. This will allow the delivery of key competences sought by business and improve the teaching skills of university professors (and other teachers and people with education responsibilities). Finally, we can assert that the acquisition of these skills constitutes a relevant factor for strengthening the social cohesion in European societies. Several European Union countries, like Latvia, will benefit, in particular, from this kind of approach: it is a well-known phenomenon that some countries are more frequently exposed to the 'brain-drain' problem, which makes it particularly important to invest in the quality of teaching.

The activities supported by the Jean Monnet programme clearly meet these expectations. The high-level academic reflection that the Programme provides on current issues in its conferences and seminars tackles these issues

from an interdisciplinary angle. Furthermore, the Jean Monnet Centres of Excellence and Jean Monnet Multilateral Research Groups pool the teaching, research and documentary resources to teach the different facets of European integration studies, involving a joint and multidisciplinary approach.

The University of Latvia has recently been awarded the first Jean Monnet Centre of Excellence in Latvia. I congratulate the University on this achievement and the initiative of this publication.

Pierre Mairesse

Director, European Commission,
General Directorate Education and Culture

1.
Educational and Demographic Trends

Sylvain Jouhette
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Eurostat, European Commission*

Education and its Role in the EU 2020 Strategy: Statistical Aspect**

Abstract

This article briefly presents the main EU initiatives in the area of education to implement the Europe 2020 strategy with a focus on the use of statistical indicators to monitor progress. Then the main features of Latvia's higher education situation in that context are characterised statistically. It shows that Latvia is a country with an increasing level of participation in higher education and tertiary education attainment of the population and that it is progressing faster than the EU average. Early leaving from education and training is still relatively high even if below the EU average. However it is decreasing and if trend is kept Latvia will reach the 10% target defined for the EU for 2020. Latvia's expenditure with higher education is relatively low when compared with other European countries, but the country is amongst the countries with highest growth of expenditure per student. Latvia's higher education level of internationalisation is between the lowest is Europe and currently imbalanced with significant more Latvians going abroad to study than foreigners going to Latvia to study.

Keywords: higher education, strategy 2020, statistical indicators.

1. Introduction

In order to respond to the demands of a modern knowledge-based economy, Europe needs more highly skilled graduates, equipped not only with specific subject knowledge, but also the types of cross-cutting skills – such as communication, flexibility and entrepreneurial spirit – that will allow them to succeed in today's labour market.

Higher education is crucial to Europe's ambitions to be a world leader in the global knowledge economy. One of the objectives of the Europe 2020 Strategy is to support the further modernisation of European higher education systems, to allow higher education institutions to reach their full potential as drivers of human capital development and innovation.

The first part of this article gives an overview of EU initiatives in the area of education to implement the Europe 2020 strategy with a focus on the use of statistical indicators to monitor progress.

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* The views expressed in this article are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission (Eurostat).

** The article was finalised in March 2011.

The second part outlines the main features of Latvia's situation in that context starting with a focus on the general situation of the higher education sector in terms of student population and participation rates. Then the transition from school to higher education is looked at, in particular early leaving from education and training in Latvia is characterised. Tertiary education attainment is then assessed as an outcome of higher education system. The issue of what resources are made available to higher education systems is looked at in two perspectives. Firstly the effort made by governments as reflected by public education expenditure as percentage of GDP is analysed. Secondly, the adequacy of resources in comparison with the needs of the system, as reflected by the expenditure in educational institutions by student is assessed. Finally, the internationalisation of the higher education systems in Europe is looked at using statistics on international mobility of students.

2. Europe 2020, the European Union's Growth Strategy

Europe 2020 is the European Union's growth strategy for the 2011-2020 decade. Europe 2020 sets three mutually reinforcing priorities aiming at a smart, sustainable and inclusive economy. Five ambitious objectives to be reached by 2020 were set in that context – on employment, innovation, education, social inclusion and climate/energy.

- Employment: 75% of the 20-64 year-olds to be employed;
- R&D/innovation: 3% of EU's GDP (public and private) to be invested in R&D/innovation;
- Climate change / energy: greenhouse gas emissions 20% (or even 30%, if the conditions are right) lower than 1990, 20% of energy from renewables, 20% increase in energy efficiency;
- Education: rates of early leavers from education and training below 10%; at least 40% of 30-34–year-olds completing third level education;
- Poverty / social exclusion: at least 20 million fewer people in or at risk of poverty and social exclusion.

Member States are expected to set national targets and outline policies to achieve these objectives. In addition, Europe 2020 is supported by seven flagship actions of which two actions adopted during 2010 relate strongly to education and training, namely "Youth on the Move" and "An Agenda for New Skills and Jobs".

3. Strategic Framework for European Cooperation in Education and Training

The focus on education and training within Europe 2020 has a significant potential to influence the future of Europe's systems. This is reflected in the strategic framework for European cooperation in education and training covering a wide set of initiatives to strengthen cooperation in the reduction of early leaving from education and training and the development of higher education.

While vocational training was identified as an area of Community action in the Treaty of Rome in 1957, education was formally recognised as an area of European Union competency in the Maastricht Treaty which established the European Community in 1992. The Treaty of Lisbon, in force since 1 December 2009, did not change the provisions on the role of the EU in education and training. Thus, the EU has a clear supporting role in education and training policies as reflected in article 165 of the Treaty: "[t]he Community shall contribute to the development of quality education by encouraging co-operation between Member States and, if necessary, by supporting and supplementing their action, while fully respecting the responsibility of the Member States for the content of teaching and the organisation of education systems and their cultural and linguistic diversity."

EU Member States and the European Commission strengthened co-operation in 2009 with a strategic framework for European cooperation in education and training ("ET 2020") a follow-up to the "Education and Training 2010" work programme launched in 2001. The long-term strategic objectives of EU education and training policies are:

- Making lifelong learning and mobility a reality;
- Improving the quality and efficiency of education and training;
- Promoting equity, social cohesion and active citizenship;
- Enhancing creativity and innovation, including entrepreneurship, at all levels of education and training.

EU level activities are being developed to address priority areas in each of the different levels of education and training – early childhood, school, higher, vocational and adult education – based on these overall aims. The EU Institutions have also established a series of indicators and targets to monitor progress in addressing key common issues at all levels of learning. These initiatives complement the Europe 2020 headline targets presented above.

The approach recognises that high-quality education and training are fundamental to Europe's success. This is especially the case for higher education which plays an essential role in society, creating new knowledge, transferring it to students and fostering innovation. EU-level actions help higher education institutions throughout Europe in their efforts to modernise, both in terms of the courses they offer and the way they operate. The rest of this article is therefore focusing on this area with a particular focus on the Latvian situation.

4. Main Policy Initiatives on Higher Education in Europe

Higher education institutions must be able to play their full part in the so-called "knowledge triangle", in which education, research and innovation interact. Europe has around 4 000 higher education institutions, with over 19 million students and 1.5 million staff. Some European universities are among the best in the world, but, overall, potential is not being fully realised. Curricula are not always up to date, not enough young people go to university, and not enough adults have ever attended university. European universities often lack the management tools and funding to match their ambitions.

However, the challenges facing higher education are similar across the EU and there are clear advantages in working together. The role of the European Commission is to support national efforts. This covers the following:

- Modernisation agenda for universities since 2006, exchange of examples of good policy practice between different countries;
- Bologna Process: inter-governmental process which promotes reforms in higher education with 47 countries, leading to establishing a 'European Higher Education Area';
- European programmes to promote co-operation in higher education with countries beyond the EU (e.g. Tempus and Erasmus Mundus).

5. Evolution of Higher Education in Latvia in Recent Past

5.1. General situation of the higher education sector – student population in higher education and participation rate

Latvia's tertiary education sector was composed in 2008 of around 130 thousand students enrolled. In statistical terms higher education is defined as all students enrolled in tertiary education programmes. From 2000 to 2008 it observed a significant increase in its tertiary education population, like it happened in the vast majority of the other European countries. From 91 thousand students in the year 2000 it increased by 41% to its 2008 level, representing an average yearly growth rate of 4.3% (Table 1).

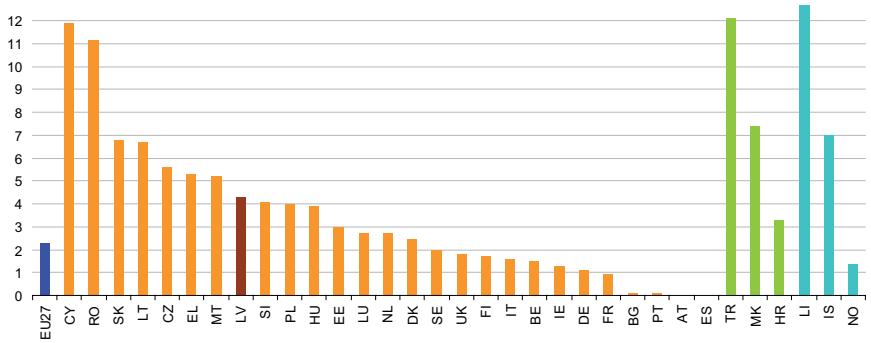
Table 1. Student population in tertiary education

Country	Number of tertiary students (in 1000)			Growth per year	Country	Number of tertiary students (in 1000)			Growth per year
	2000	2007	2008	2000-08		2000	2007	2008	2000-08
EU-27	15920	18884	19040	2.3	MT - Malta	6.3	9.8	9.5	5.2
BE - Belgium	356	394	402	1.5	NL - Netherlands	488	583	602	2.7
BG - Bulgaria	261	259	265	0.2	AT - Austria	290	261	285	-0.2
CZ - Czech Republic	254	363	393	5.6	PL - Poland	1580	2147	2166	4.0
DK - Denmark	189	232	231	2.5	PT - Portugal	374	367	377	0.1
DE - Germany	2055	2279	2245	1.1	RO - Romania	453	928	1057	11.2
EE - Estonia	53.6	68.8	68.2	3.1	SI - Slovenia	84	116	115	4.0
IE – Ireland	161	190	179	1.3	SK - Slovakia	136	218	230	6.8
EL - Greece	422	603	638	5.3	FI - Finland	270	309	310	1.`7
ES - Spain	1829	1778	1781	-0.3	SE - Sweden	347	414	407	2.0
FR - France	2015	2180	2165	0.9	UK - United Kingdom	2024	2363	2330	1.8
IT - Italy	1770	2034	2014	1.6	HR - Croatia[03]	122	140	143	3.3
CY - Cyprus	10.4	22.2	25.7	11.9	MK - FYR of Macedonia	36.9	58.2	65.5	7.4
LV - Latvia	91	130	128	4.3	TR - Turkey	1015	2454	2533	12.1
LT - Lithuania	122	200	205	6.7	IS - Iceland	9.7	15.8	16.6	6.9

LU - Luxembourg	2.4	2.7	3.0	2.8	LI - Liechtenstein	0.5	0.7	0.8	6.3
HU - Hungary	307	432	414	3.8	NO - Norway	191	215	213	1.4

Source: Eurostat
Notes: For Croatia data refers to 2003 instead of 2000.

This growth rate puts Latvia is in the top quarter of the EU countries with the highest relative increase in tertiary education student population (Graph 1). The overall EU increased at a 2.5% rate and the countries with the highest growth rates were Cyprus and Romania. Apart from these two, only Slovakia, Lithuania, Czech Republic and Malta had higher increases than Latvia.



Source: Eurostat

Graph 1. Average yearly growth rate between 2000 and 2008 of the number of students enrolled in tertiary education

An increase in the student population can result from two different sources. The resident population of the country might be increasing and the tertiary education sector has to accommodate to that reality by increasing its capacity; or a larger percentage of the population is participating in tertiary education.

The increase in the participation in tertiary education is high on the policy agenda. It is part of the chain from entrance to graduation which will lead to an increase in the tertiary attainment which is one of the objectives of Europe 2020.

One measure of tertiary education participation rate in is the number of students in a typical age as a percentage of the population of the same age. In most of the countries, the typical age to participate in tertiary education is between 20 and 24 years old. However, this indicator has some limitations as lower participation rates of 20-24 years olds may simply reflect the fact tertiary education studies are done only at a later stage in lives.

In the EU the students with between 20 and 24 years old represented 28.7% of the population of the same age in 2008. Latvia had a participation rate higher than the EU average with 33.0% (Table 2).

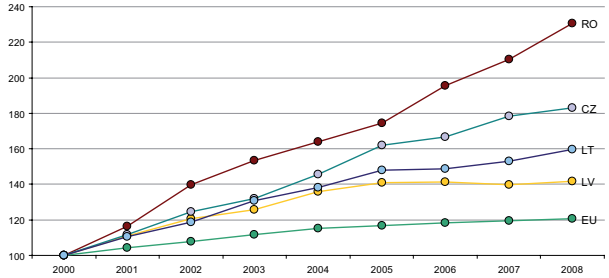
Table 2. Tertiary education students aged 20-24 as percentage of corresponding age population

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
EU-27	**22.8**	**23.8**	**24.8**	**25.7**	**26.6**	**27.4**	**27.8**	**28.2**	**28.4**	**28.7**
Belgium	29.9	29.6	29.4	29.8	30.2	30.8	30.9	31.2	31.3	32.6
Bulgaria	23.7	23.8	22.9	22.7	23.5	24.2	26.5	27.0	29.0	29.5
Czech Republic	15.1	17.1	19.1	21.3	22.6	24.9	27.7	28.5	30.5	31.3
Denmark	22.5	23.3	24.2	25.2	26.0	27.2	28.2	28.4	28.8	29.3
Germany	18.3	18.6	19.1	19.9	20.7	21.8	22.3	22.7	22.6	22.4
Estonia	25.6	27.3	28.1	29.1	28.9	30.3	30.8	30.8	31.2	31.4
Ireland	20.3	21.1	21.6	22.5	22.9	23.8	23.2	23.0	23.1	22.5
Greece	22.8	22.4	30.0	33.8	36.1	39.9	37.1	38.4	36.6	40.0
Spain	29.5	30.6	30.0	30.3	29.9	29.7	29.0	28.8	28.5	28.4
France	30.1	30.4	30.2	29.3	29.6	29.7	29.1	29.1	28.6	28.4
Italy	24.3	24.2	25.1	26.2	28.3	29.7	30.0	30.7	31.1	31.3
Cyprus	11.8	10.8	11.5	14.4	21.0	21.9	17.6	17.0	17.3	19.8
Latvia	**24.1**	**23.3**	**25.8**	**28.1**	**29.3**	**31.7**	**32.8**	**32.9**	**32.6**	**33.0**
Lithuania	22.8	26.2	29.0	31.1	34.3	36.2	38.8	39.0	40.1	41.8
Luxembourg	:	:	:	:	:	:	:	5.8	:	6.6
Hungary	18.3	20.1	21.2	23.0	25.5	28.0	29.5	30.3	30.8	31.4
Malta	9.7	13.2	11.1	10.9	14.4	15.5	15.4	18.3	16.2	:
Netherlands	26.3	27.2	27.5	27.8	28.3	28.9	29.8	30.8	31.7	32.4
Austria	21.3	20.1	20.5	19.5	20.3	21.2	21.7	22.3	23.9	24.6
Poland	26.2	28.8	32.3	34.7	35.9	37.2	38.4	39.3	40.0	40.8
Portugal	22.8	24.7	25.3	25.9	26.1	26.1	25.9	25.4	25.3	25.3
Romania	12.0	13.3	15.5	18.6	20.4	21.8	23.2	26.0	28.0	30.7
Slovenia	30.9	32.2	34.8	37.8	39.2	40.0	42.8	44.5	46.1	47.7
Slovakia	:	16.7	17.6	18.6	19.3	21.2	23.0	25.1	27.3	28.6
Finland	36.3	37.9	38.7	38.9	40.1	40.3	40.1	39.9	39.6	39.2
Sweden	25.8	26.8	27.5	28.9	30.4	31.2	30.9	30.5	29.2	27.1
United Kingdom	19.6	19.5	19.8	20.7	20.3	20.3	20.2	20.1	19.8	19.7
Croatia	:	:	:	:	21.7	22.7	24.6	25.6	26.6	27.7
FYR of Macedonia	12.6	13.2	14.6	15.9	17.0	17.6	18.5	17.9	20.9	22.8
Turkey	10.3	8.0	8.5	9.3	10.1	14.9	16.2	17.6	:	20.5
Iceland	19.8	22.5	22.1	23.4	25.6	26.6	26.5	27.2	26.6	25.2
Liechtenstein	:	:	:	:	8.3	9.6	8.2	12.5	13.9	16.4
Norway	30.6	31.0	28.8	28.2	30.9	31.4	31.8	32.3	31.9	31.2
Switzerland	:	:	:	18.0	19.1	19.9	20.3	20.7	21.3	22.4
Albania	:	:	:	:	:	:	:	12.7	:	:
United States	25.4	26.7	28.3	35.2	31.0	33.8	33.3	34.3	34.0	34.7
Japan	0.8	:	:	:	:	:	:	:	:	:

Source: Eurostat

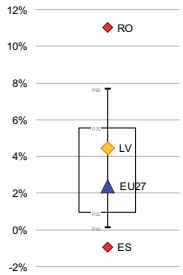
Not only Latvia had a participation rate above the EU average in 2008, but its increase from 1999 to 2008 was also above the EU level. In 1999 the participation rate in tertiary education in Latvia was 24.1%, 8.9 percentage points than in 2008. This means that in a bit less than ten years 9% more of the population with 20 and 24 years old has been studying in tertiary education.

Reflecting its very significant increase in student population, the country with the most impressive increase in participation rate was Romania, from 12.0% in 1999 to 30.7 in 2008. Besides Romania, the Czech Republic and Lithuania made up the top three countries in terms of increase in participation rate (Graph 2). Latvia in comparison with the other European countries was in top half in terms of increase in participation rate (Graph 3).



Source: Eurostat

Graph 2. Index of tertiary education students aged 20-24 as percentage of corresponding age population (year 2000 = 100)



Source: Eurostat

Graph 3. Box-plot of average yearly growth rate

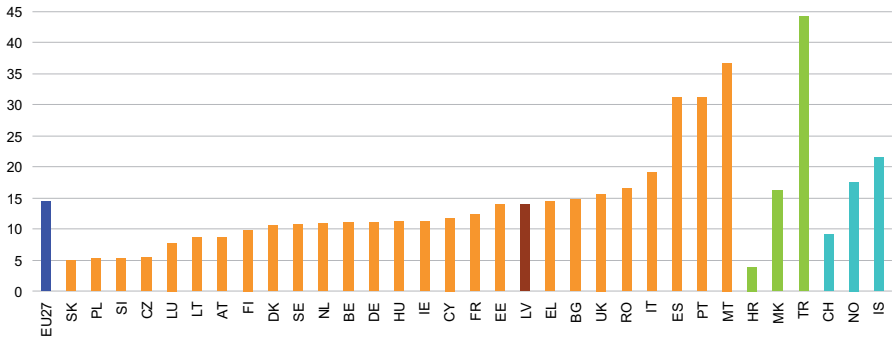
5.2. From school to higher education – early leaving from education and training

In order to participate in tertiary education young Latvians and other Europeans have to successfully graduate from secondary education with a qualification that allows them to access tertiary education. With the current focus in the EU on tertiary education attainment, those failing to do so are considered as early leavers.

However, leaving education and training too early, does not only impair the EU objective to increase tertiary education attainment and move forwards towards a knowledge society. Young people who abandon education and training with only lower secondary education or less are more often unemployed or in precarious employment. They generally earn less, are more dependent on social support throughout their lives and face a higher risk of poverty and social exclusion.

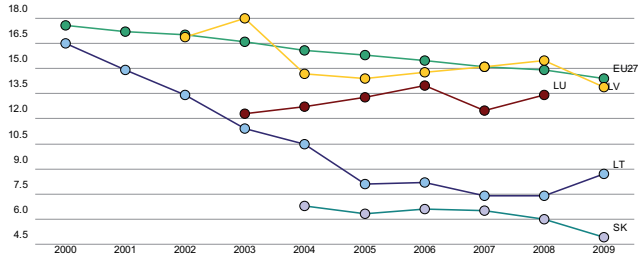
One of the headline targets of the Europe 2020 Strategy is on the reduction of early school leaving to less than 10% of the young population by 2020. It is strongly related both to smart and to inclusive growth as it impacts

directly on the employability of young people and their integration into the labour market. Reducing early leaving from education and training is an important contribution to breaking the cycle of deprivation, social exclusion and poverty.



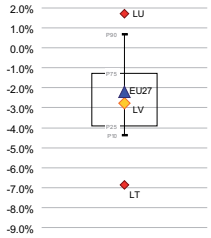
Source: Eurostat

Graph 4. Percentage of the population aged 18-24 with at most lower secondary education and not in further education or training



Source: Eurostat

Graph 5. Percentage of the population aged 18-24 with at most lower secondary education and not in further education or training



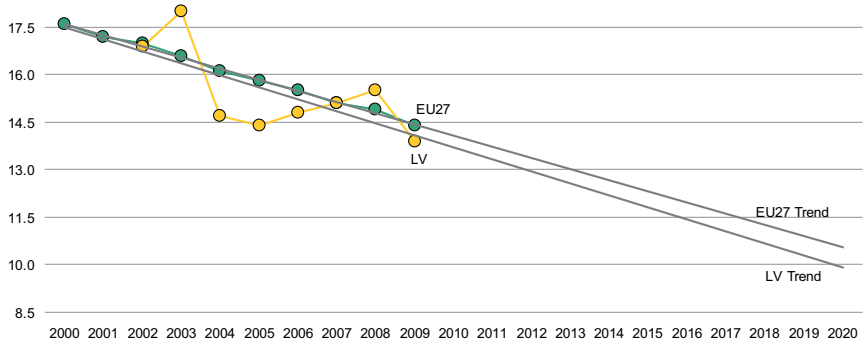
Source: Eurostat

Graph 6. Box-plot of average yearly growth rate

By 2009 Latvia had a rate of early leaving from education and training below the EU average, but still above the 10% target. The percentage of youngsters with between 18 and 24 years old with at most lower secondary education and not in further education or training in Latvia was 13.9%. For the same year, this indicator was 14.4% for the overall EU. However, Latvia was still in the top third of the countries with the highest early leaving from education and training (Graph 4).

In terms of progression in time, from 2002 to 2009 Latvia has decreased its early leaving from education and training by an average of 0.4 percentage points per year, around 2.8% of its level in the beginning of the decade (Graph 6). This is a reduction slightly higher than the one observed for the overall EU. In the same period the country which had the most significant decrease of early leaving from education and training was Lithuania (Graph 5).

Although the evolution of early leaving from education and training in Latvia since 2002 to 2009 has been irregular, it follows a very close trend to the one of the overall EU (Graph 7). If that same trend is maintained in the future until 2020 then Latvia should be able to meet the European objective of reducing it to 10%. For the overall EU, such objective will only be met with additional effort.



Source: Eurostat

Graph 7. Trends in Latvia and in the EU in early leaving from education and training

In 2009 the EU Member States with highest early leaving from education and training were Malta, Portugal and Spain. Malta and Portugal had significant decreases of the percentage of youngsters who left education and training prematurely. Malta decreased it from 54.2% to 36.8% and Portugal from 43.6% to 31.2%. However, Spain did not decrease its early leaving from education and training during the whole decade (Table 3).

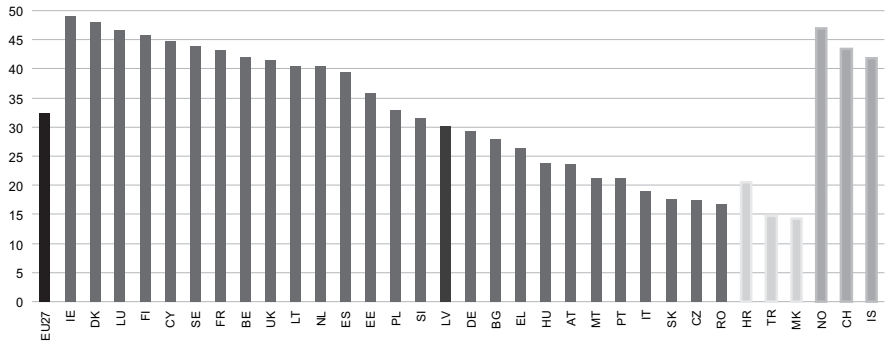
Table 3. Percentage of the population aged 18-24 with at most lower secondary education and not in further education or training

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
EU-27	**17.6** (e)	**17.2** (e)	**17.0**	**16.6** (b)	**16.1**	**15.8**	**15.5**	**15.1**	**14.9**	**14.4**
Belgium	13.8	13.8	14.1	14.3	13.1 (b)	12.9	12.6	12.1	12.0	11.1
Bulgaria	:	20.5	20.7	21.9	21.4	20.4	17.3	14.9	14.8	14.7
Czech Republic	:	:	5.7	6.5 (b)	6.3	6.2	5.1	5.2	5.6	5.4
Denmark	11.7	9.2	9.0	10.4 (b)	8.8	8.7	9.1	12.5 (b)	11.3	10.6
Germany	14.6	12.3	12.5	12.8 (i)	12.1	13.5 (b)	13.6	12.5	11.8	11.1
Estonia	15.1	14.4	13.2	12.9	13.1	13.4	13.5	14.4	14.0	13.9
Ireland	:	:	14.6	13.1 (b)	13.1	12.5	12.1	11.6	11.3	11.3
Greece	18.2	17.1	16.5	16.0 (b)	14.7	13.6	15.5	14.6	14.8	14.5
Spain	29.1	29.7	30.7	31.6	32.0	30.8 (b)	30.5	31.0	31.9	31.2
France	13.3	13.5	13.4	13.2 (b)	12.8	12.2	12.4	12.6	11.9	12.3
Italy	25.1	25.9	24.2	23.0	22.3	22.0	20.6	19.7	19.7	19.2
Cyprus	18.5	17.9	15.9	17.3 (b)	20.6	18.2 (b)	14.9	12.5	13.7	11.7
Latvia	:	:	16.9	18.0	14.7	14.4	14.8	15.1	15.5	13.9
Lithuania	16.5	14.9	13.4 (b)	11.4	10.5 (b)	8.1	8.2	7.4	7.4	8.7
Luxembourg	16.8	18.1	17.0	12.3 (b)	12.7	13.3	14.0	12.5	13.4	7.7 (p)
Hungary	13.9	13.1	12.2	12.0 (b)	12.6	12.5	12.6	11.4	11.7	11.2
Malta	54.2	54.4	53.2	49.9	42.1 (b)	38.9	39.9	38.3	39.0 (p)	36.8 (p)
Netherlands	15.4	15.1	15.3	14.3 (b)	14.1	13.5	12.6	11.7	11.4	10.9
Austria	10.2	10.2	9.5	9.0 (b)	9.5 (i)	9.1	9.8	10.7	10.1	8.7
Poland	:	7.4	7.2	6.0	5.6 (b)	5.3	5.4	5.0	5.0	5.3
Portugal	43.6	44.2	45.0	41.2	39.4 (b)	38.8	39.1	36.9	35.4	31.2
Romania	22.9	21.7	23.0	22.5	22.4 (b)	19.6	17.9	17.3	15.9	16.6
Slovenia	:	6.4	5.1	4.6 (u)	4.3 (u)	4.9 (u)	5.6	4.1 (u)	5.1 (u)	5.3 (u)
Slovakia	:	:	6.7	5.3 (b)	6.8	6.3	6.6	6.5	6.0	4.9
Finland	9.0 (i)	9.5 (i)	9.7 (i)	10.1 (i)	10.0 (i)	10.3 (i)	9.7 (i)	9.1 (i)	9.8 (i)	9.9 (i)
Sweden	7.3	10.2 (b)	10.0	9.2 (p)	9.2 (p)	10.8 (p)	13.0 (p)	12.2 (p)	12.2 (p)	10.7 (p)
United Kingdom	18.2	17.8	17.6	12.1 (b)	12.1	11.6	11.3	16.6 (b)	17.0	15.7
Croatia	:	:	8.0	7.9	5.4	5.1 (u)	4.7 (u)	3.9 (u)	3.7 (u)	3.9 (u)
F.Y.R. Macedonia	:	:	:	:	:	:	22.8	19.9	19.6	16.2
Turkey	59.3	58.2	55.0	53.0	54.5	51.7	48.8	46.9	45.5	44.3
Iceland	29.8	30.9	28.8	20.3 (b)	24.9	24.9	25.6	23.2	24.4	21.4
Liechtenstein	:	:	:	:	:	:	:	:	:	:
Norway	12.9	8.9	13.5	6.3 (b)	4.7	4.6	17.8 (b)	18.4	17.0	17.6
Switzerland	7.3	6.6	6.7	9.7 (b)	9.5	9.7	9.6	7.6	7.7	9.2

:=Not available e=Estimated value b=Break in series i=See explanatory text p=Provisional value u=Unreliable or uncertain data. Source: Eurostat

5.3. Outcomes – tertiary education attainment, evolution and comparison with other EU countries

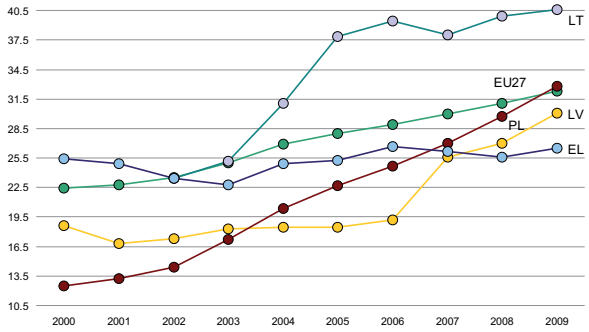
Apart from early leaving from education and training, the second target adopted by Europe 2020 strategy directly related to education is tertiary attainment. Tertiary attainment is measured as the share of population aged 30-34 years who have successfully completed university or university-like (tertiary-level) education. This indicator measures the Europe 2020 strategy's headline target to increase the share of the 30-34 years old having completed tertiary or equivalent education to at least 40% in 2020.



Source: Eurostat

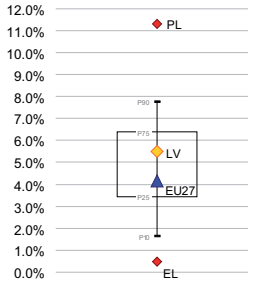
Graph 7a. Share of population aged 30-34 years who have successfully completed tertiary education

As of 2009, Latvia was the median country in the EU in terms of tertiary attainment. There was almost the same number of countries with a higher tertiary attainment than Latvia as there were countries with a lower value. The percentage of persons in Latvia with between 30 and 34 years old and a tertiary education degree was 30%. The overall value for the EU is slightly higher with 32%. The countries with highest tertiary attainment in the EU were Ireland, Denmark, Luxembourg and Finland, all with a value above 45%. Of the 27 EU Member States, 11 were already above the 40% target defined for the EU in the Europe 2020 strategy. The countries with the lowest values were Romania, Czech Republic, Slovakia and Italy, with values below half of the EU target.



Source: Eurostat

Graph 8. Share of population aged 30-34 years who have successfully completed tertiary education



Source: Eurostat

Graph 9. Box-plot of average yearly growth rate

Between 2000 and 2009, Latvia increased its tertiary attainment from 18.6% to 30.1% (Table 4). That is, 11.5% more of its population aged 30 to 34 years old had a tertiary education degree. This increased happened in the second half of the decade. Between 2000 and 2006 tertiary attainment in Latvia was at the same level, around the 19%. It was between 2006 and 2009 that tertiary attainment increased consistently from 19% to 30%.

The overall increase of Latvia in the decade, although not between the most impressive in the EU, was still above the EU average. The overall EU increased its tertiary attainment from 22.4% to 32.3%, an increase of 9.9 percentage points. Latvia is therefore catching up with the rest of the EU in terms of tertiary attainment. If Latvia keeps the same difference to the EU in growth of tertiary attainment, the country should catch up with the European average by 2015.

Between 2000 and 2009 the country with the most significant increase in tertiary attainment was Poland. From 12.5% in 2000, Poland reached 32.8% in 2009 when it over passed the European average for the first time. The country with the lowest increase in the decade was Greece where tertiary attainment in 2009 was half percentage point above its level in 2000. All in all, all EU Member States increased their tertiary attainment during the 2000-2009 decade.

Table 4. Share of population aged 30-34 years who have successfully completed tertiary education

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
EU-27	**22.4**	**22.8**	**23.5**	**25.0**	**26.9**	**28.0**	**28.9**	**30.0**	**31.1**	**32.3**
Belgium	35.2 (b)	35.2	35.2	37.7	39.9	39.1	41.4	41.5	42.9	42.0
Bulgaria	19.5	23.6(b)	23.2	23.6	25.2	24.9	25.3(i)	26.0	27.1	27.9
Czech Republic	13.7	13.3	12.6	12.6	12.7	13.0	13.1	13.3	15.4	17.5
Denmark	32.1	32.9(i)	34.2	38.2(b)	41.4	43.1	43.0	42.5(b)	45.4(p)	48.1
Germany	25.7	25.5	24.2	25.1	26.8	26.0(b)	25.9	26.5	27.7	29.4
Estonia	30.8 (b)	29.5	28.1	27.6	27.4	30.6	32.5	33.3	34.1	35.9
Ireland	27.5	30.6	32.0	35.1	38.6	39.2	41.3	43.3	46.1	49.0
Greece	25.4	24.9	23.4	22.8	24.9	25.3	26.7	26.2	25.6	26.5
Spain	29.2	31.3	33.3	34.0	35.9	38.6	38.1	39.5	39.8	39.4
France	27.4	29.5	31.5	34.7(b)	35.6	37.7	39.7	41.5	41.3	43.3
Italy	11.6 (b)	12.2	13.1	13.9	15.6	17.0	17.7	18.6	19.2	19.0
Cyprus	31.1	32.7	36.0	39.9	41.0	40.8	46.1	46.2	47.1	44.7
Latvia	**18.6**	**16.8**(i)	**17.3**(b)	**18.3**	**18.5**	**18.5**	**19.2**	**25.6**	**27.0**	**30.1**
Lithuania	42.6 (i)	21.2	23.4(b)	25.2	31.1	37.9	39.4	38.0	39.9	40.6
Luxembourg	21.2	23.9	23.6	17.3(b)	31.4	37.6	35.5	35.3	39.8	46.6(p)
Hungary	14.8	14.8	14.4	16.3(b)	18.5	17.9	19.0	20.1	22.4	23.9
Malta	7.4 (u)	12.9(u)	9.3(u)	13.7(b)	17.6	18.4	21.6	21.5	21.0(p)	21.1(p)
Netherlands	26.5	27.2	28.6	31.7	33.6	34.9	35.8	36.4	40.2	40.5
Austria	:	:	:	:	21.0(i)	20.5	21.2	21.1	22.2	23.5
Poland	12.5 (b)	13.2	14.4	17.2	20.4	22.7	24.7	27.0	29.7	32.8
Portugal	11.3	11.7	13.0	14.9	16.5	17.7	18.4	19.8	21.6	21.1
Romania	8.9	8.8	9.1	8.9	10.3	11.4	12.4	13.9	16.0	16.8
Slovenia	18.5 (b)	18.1	20.7	23.6	25.1	24.6	28.1	31.0	30.9	31.6
Slovakia	10.6	10.7	10.5	11.5	12.9	14.3	14.4	14.8	15.8	17.6
Finland	40.3 (b)	41.6	41.2	41.7	43.4	43.7	46.2	47.3	45.7	45.9
Sweden	31.8	26.6(b)	28.3	31.0	33.9	37.6	39.5(p)	41.0(p)	42.0(p)	43.9(p)
United Kingdom	29.0	29.9	31.5	31.5	33.6	34.6	36.5	38.5	39.7	41.5
Croatia	:	:	16.2	16.9	16.8	17.4	16.7	16.7(u)	18.5(u)	20.5(u)
F.Y.R. Macedonia	:	:	:	:	:	:	11.6	12.2	12.4	14.3
Turkey	:	:	:	:	:	:	11.9	12.3	13.0	14.7
Iceland	32.6	31.0	33.6	38.2	38.8	41.1	36.4	36.3	38.3	41.8
Norway	37.3	42.2	43.4	40.7	39.5	39.4	41.9(b)	43.7	46.2	47.0
Switzerland	27.3	27.3	30.0	32.4	32.8	33.4	35.0	36.5	41.3	43.5

:=Not available e=Estimated value b=Break in series i=See explanatory text p=Provisional value u=Unreliable or uncertain data

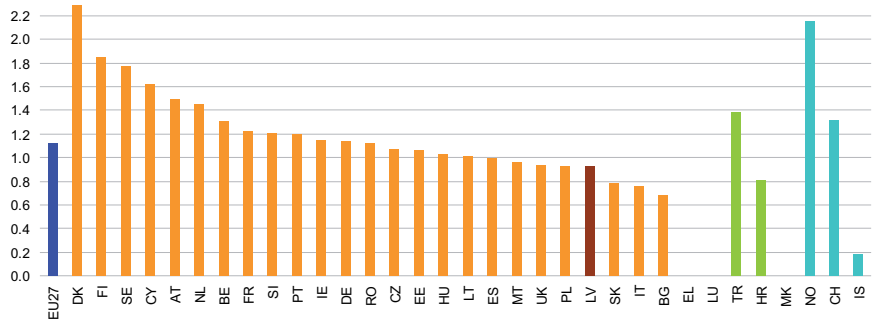
Source: Eurostat

5.4. Resources available to higher education – public expenditure on higher education as percentage of GDP and expenditure in higher education institutions per student

In order for European tertiary education institutions to be able to play their part in Europe 2020 strategy they need appropriate funding. Although differing in weight from country to country, governments bear the large majority of the funding of tertiary education. Thus, one main indicator used to assess the financial effort of a country in supporting its tertiary education system is its public expenditure on tertiary education as a percentage of GDP.

The expenditure on education of governments at all levels, local, regional or national, includes not only the funding of colleges and universities, but also all other educational institutions which provide tertiary education related services. This includes non-instructional institutions such as entities administering education (for example, ministries or departments of education), entities providing ancillary services (vocational and psychological counselling, transportation of students, etc.), and entities performing curriculum development, educational research and educational policy analysis.

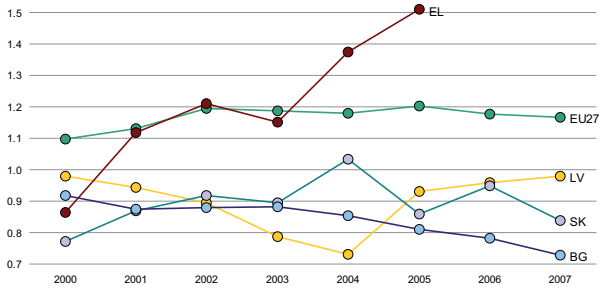
In addition to this direct expenditure on educational institutions, governments' education expenditure also includes transfers and payments for education to the private sector. These include mainly financial aid to students and their families, but also transfers and payments to other private entities.



Source: Eurostat

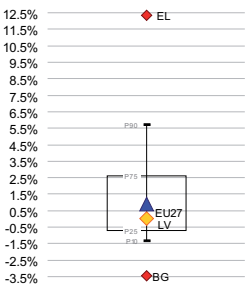
Graph 10. Public expenditure on tertiary education as a percentage of GDP

Between 2000 and 2007, the last year for which data is available, Latvia has been one of the countries in the EU where the government spends the least in tertiary education as a percentage of GDP. In 2007 public expenditure on tertiary education represented 0.930% of Latvia's GDP, when the overall average in the EU was one fifth higher with 1.116% (Table 5). In that year, only Slovakia, Italy and Bulgaria had lower values of public expenditure on tertiary education in percentage of GDP.



Source: Eurostat

Graph 11. Public expenditure on tertiary education as percentage of GDP – comparison with the best and worst performers



Source: Eurostat

Graph 12. Box-plot of average yearly growth rate

During the period between 2000 and 2007 public expenditure on tertiary education in the EU as a percentage of GDP has been relatively stable. After a slight increase in 2001 and 2002, it has maintained its level and in the last two years for which there is data it has even decreased slightly. The evolution of public expenditure on tertiary education in Latvia between 2000 and 2007 can be split in two different periods (Graph 11). Between 2000 and 2004 expenditure has systematically decreased as percentage of GDP. After 2004 and until 2007 it has increased returning to the level of the beginning of the decade.

A decrease of public expenditure on tertiary education as percentage of GDP does not necessarily means that funding has been reduced in absolute terms. A strong GDP growth at a level higher than the growth of expenditure will result in a decrease in the indicator. In order to know if GDP growth is behind the decrease of the ratio expenditure as percentage of GDP, the variation in the indicator can be decomposed between the variation in expenditure and the variation in GDP:

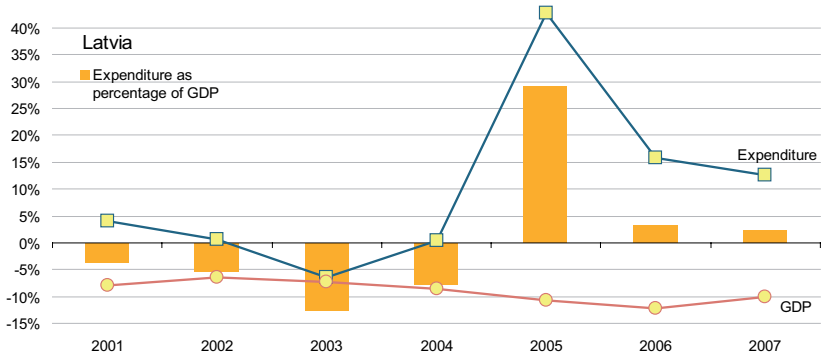
$$\begin{pmatrix}\text{Percentage variation in expenditure}\\ \text{as percentage of GDP}\end{pmatrix} \approx \begin{pmatrix}\text{Percentage variation}\\ \text{in expenditure}\end{pmatrix} - \begin{pmatrix}\text{Percentage variation}\\ \text{in GDP}\end{pmatrix}$$

The percentage variation in expenditure as percentage of GDP is approximately equal to the percentage variation in expenditure minus the percentage variation in GDP.

In fact, the decrease in public expenditure on tertiary education as a percentage of GDP in Latvia between 2001 and 2004 was due partly to a GDP growth higher than the increase in the public funds dedicated to tertiary education (Graph 13). GDP in real terms (in constant prices) increased at a yearly rate of between 6% and 10% while real expenditure increased only in 2001, and at a lower rate than GDP. However, from 2002 to 2003 public expenditure on tertiary education did decrease in real terms by 6% and its combination with

a GDP growth of 7% resulted in a decrease of 13% in the funds to tertiary education as a percentage of GDP.

After 2004 and until 2007, GDP growth in real terms increased compared to the first half of the decade, but a significant increase of public expenditure on tertiary education returned its level as percentage of GDP to the level of year 2000.



Source: Eurostat

Note: Variation of GDP represented in the negative part of the vertical axis because it contributes negatively to the variation of public expenditure on tertiary education as a percentage of GDP.

Graph 13. Percentage variation in public expenditure on tertiary education in constant prices, in GDP in constant prices and in the ratio public expenditure on tertiary education as percentage of GDP

While measuring the effort a government makes to support its tertiary education system, the public expenditure as percentage of GDP does not reflect exactly the financial resources made available to the institutions. That's because part of the funding of tertiary education is private, either in the form of fees paid by students or transfers from other private entities. Also, the quality of education provision depends not only of the total value of funding provided to institutions but mainly the funding in relation to the number of students. For this reason an important measure of the adequacy of funding of tertiary education is expenditure in education institutions per full-time equivalent student.

In 2007, on average the EU spent 9 thousand Euros per student in tertiary education (Table 6). The country that spent the most was Sweden with 15 thousand Euros in purchasing power standards. Purchasing power standards take into account the differences between countries in the general price levels. Latvia was amongst the countries which spent the least, with 4 544 Euros PPS, half the European level.

Table 5. Public expenditure on tertiary education as a percentage of GDP

	2000	2001	2002	2003	2004	2005	2006	2007
EU-27	**1.05**	**1.08**	**1.15**	**1.14**	**1.13**	**1.15**	**1.13**	**1.12**
Belgium	1.26 i	1.34 i	1.32 i	1.31 i	1.29 i	1.29 i	1.32 i	1.31 i
Bulgaria	0.87	0.82	0.83	0.83	0.80	0.76	0.73	0.68
Czech Republic	0.75	0.79	0.86	0.94	0.94	0.89	1.23	1.07
Denmark	2.49 i	2.71 i	2.70 i	2.50 i	2.51 i	2.38 i	2.26 i	2.29 i
Germany	1.08	1.10	1.16	1.19	1.16	1.14	1.11	1.14
Estonia	1.04	1.03	1.08	1.02	0.86	0.92	0.91	1.07
Ireland	1.29	1.22	1.18	1.09 i	1.10 i	1.11 i	1.14 i	1.14 i
Greece	0.81 i	1.07 i	1.16 i	1.10 i	1.32 i	1.46 i	:	0.00
Spain	0.93	0.97	0.97	0.99 i	0.97 i	0.95 i	0.95 i	0.99 i
France	1.22	1.21	1.22	1.23	1.21	1.19	1.20	1.23
Italy	0.81	0.80	0.85	0.78	0.77	0.76	0.77	0.76
Cyprus	0.92 i	1.14 i	1.38 i	1.55 i	1.48 i	1.58 i	1.65 i	1.61 i
Latvia	**0.93**	**0.89**	**0.85**	**0.74**	**0.68**	**0.88**	**0.91**	**0.93**
Lithuania	0.97	1.33	1.40	1.00 i	1.06 i	1.03 i	1.00 i	1.01 i
Luxembourg	:	:	:	:	:	:	:	0.00
Hungary	0.93	1.08	1.22	1.22	1.01	1.03	1.04	1.03
Malta	0.80	0.88	0.90	0.81	0.53	1.07	:	0.95
Netherlands	1.39	1.36	1.34	1.42	1.45	1.47	1.50	1.45
Austria	1.29	1.37	1.29	1.31	1.44	1.49	1.48	1.50
Poland	0.72	1.04	1.05	1.02	1.15	1.19	0.96	0.93
Portugal	0.98 i	1.03 i	0.95 i	1.00 i	0.83 i	0.98 i	1.00 i	1.20 i
Romania	0.40	0.78	0.70	0.68 i	0.70 i	0.81 i	0.90	1.12
Slovenia	:	1.28	1.27	1.30	1.31	1.25	1.23	1.21
Slovakia	0.72 i	0.82 i	0.87 i	0.85 i	0.98 i	0.81 i	0.90 i	0.79 i
Finland	2.01	2.00	2.02	2.06	2.07	2.01	1.96	1.85
Sweden	1.96	2.00	2.10	2.11	2.04	1.92	1.84	1.77
United Kingdom	0.78 i	0.79 i	1.05 i	1.04 i	0.99 i	1.20 i	1.10 i	0.94 i
Croatia	:	:	0.59 i	0.73 i	0.71	0.76 i	0.88 i	0.81 i
F.Y.R. Macedonia	0.80 i	0.87 i	0.95 i	0.96 i	0.87 i	:	0.91	:
Iceland	1.04 i	1.07 i	1.25 i	1.33 i	1.39 i	1.45 i	1.36 i	1.39 i
Liechtenstein	:	:	0.35	0.32	0.34	0.20	0.19	0.17
Norway	1.67	1.84	2.08	2.29	2.40	2.27	2.07	2.16
Switzerland	:	1.25	1.39	1.62	1.65	1.48	1.45	1.32

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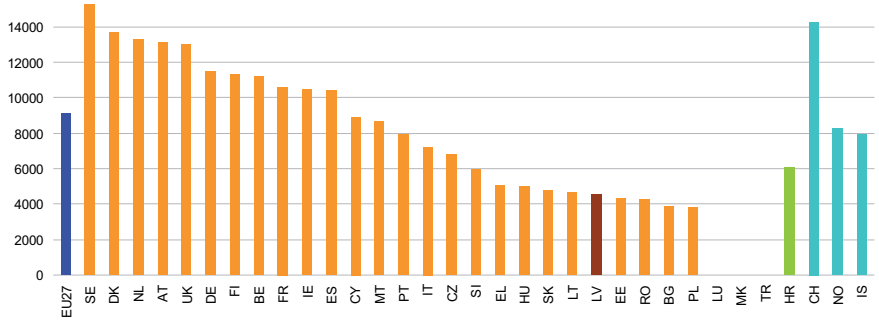
Source: Eurostat

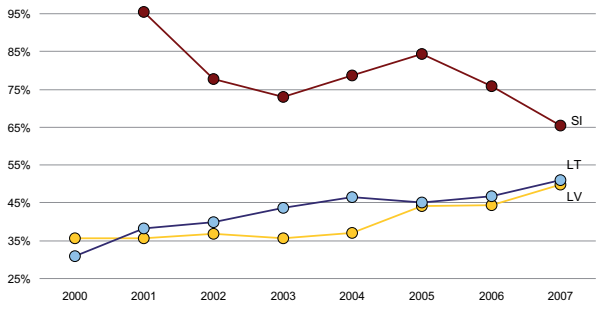


Source: Eurostat

Graph 14. Expenditure in educational institutions per student (in full-time equivalents) in purchasing power standards (PPS)

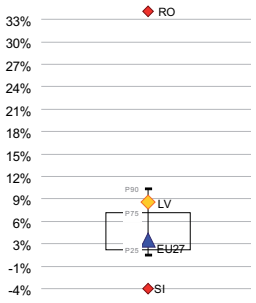
However, in terms of evolution between 2000 and 2007, Latvia is amongst the countries with the most significant increases of expenditure per student in purchasing power standards (Graph 16). As a result, Latvia got closer to the European average. In 2000 the 2 636 Euros PPS spent per student in Latvia in tertiary education institutions represented 36% of the EU average, while in 2007 this value reached the 50%.

Other European countries with significant increases in expenditure per student were Lithuania and Romania (only considering the period from 2005 to 2007 for which data is available). Slovenia was the only country where expenditure per student has decreased in comparison with the EU average (Graph 15).



Source: Eurostat

Graph 15. Expenditure in educational institutions per student (in full-time equivalents) in PPS as a percentage of the EU average – comparison with the best and worst performers



Source: Eurostat

Graph 16. Box-plot of average yearly growth rate

Table 6. Expenditure in educational institutions per student (in full-time equivalents) in PPS

	2000	2001	2002	2003	2004	2005	2006	2007
EU-27	**7387**	**7739**	**8002**	**7955**	**7919**	**8324**	**8573**	**9102**
Belgium	9406 i	9927 i	10483 i	10008 i	9623 i	10009 i	10972 i	11209 i
Bulgaria	2795	2951	3463	3646	3611	3568	3862	3837
Czech Republic	4546	5087	5313	5914	5584	5599	7708	6825
Denmark	11262	12571	13170	11765 i	12822 i	12423 i	12934 i	13689 i
Germany	9226	9353	9579	10152	10118	10603	10866	11492
Estonia	:	:	:	:	:	3287	3342	4339
Ireland	9539	8494	8369	7941 i	8511 i	8877 i	9764 i	10501 i
Greece	4966	3857 i	4152 i	4127	4706	5050		5050
Spain	5966	6578	6943	7520 i	7873 i	8480 i	9329 i	10432 i
France	8373	8680	9119	8790	8872	9202	9614	10619
Italy	6482	7277	6980	7087	6417	6758	7026	7211
Cyprus	8570	8494	8697	7507	7344	8685	9578	8923
Latvia	**2636**	**2751**	**2946**	**2840**	**2932**	**3678**	**3811**	**4544**
Lithuania	2284 i	2957 i	3192 i	3482	3686	3758	4015	4652
Luxembourg	:	:	:	:	:	:	:	:
Hungary	4589	:	:	:	5536	5297	5033	5033 -
Malta	6014 i	5886 i	7024 i	5763	5808	9128	:	8689
Netherlands	11571	11999	12461	12227	12387	12628	12688	13276
Austria	8305	9641	10830	11018 i	11893 i	12504 i	12924 i	13133 i
Poland	2686	3363	4124	3543 i	3717 i	4742 i	3605 i	3812 i
Portugal	4337 i	4221 i	3984 i	4429 i	4652 i	6391 i	7209 i	7940 i
Romania	:	:	:	:	:	2376	2628	4239
Slovenia	:	7385	6218	5804	6243	7033	6510	5955 i
Slovakia	4185 i	4767 i	4143 i	4027 i	5486 i	4886 i	5039 i	4769 i
Finland	9549	7833	9692	9811	10527	10353	10721	11279
Sweden	13670	13213	13452	13535	13778	13164	14126	15265
United Kingdom	8555 i	9098 i	9755 i	9827 i	9389 i	12196 i	13052 i	13016 i
Croatia	:	:	3320	3332	3391	5211	5994	6062 i
F.Y.R. Macedonia	:	:	:	:	:	:	:	:
Iceland	3673	3350	3978	3372	5577	:	:	:
Liechtenstein	7066 i	6779 i	7371 i	6675 i	7686 i	8041 i	7294 i	7912 i
Norway	:	:	17472 i	13972 i	10470 i	16802 i	19595	8295
Switzerland	11059	11662	11784	11851 i	12556 i	12944 i	13528 i	14250 i

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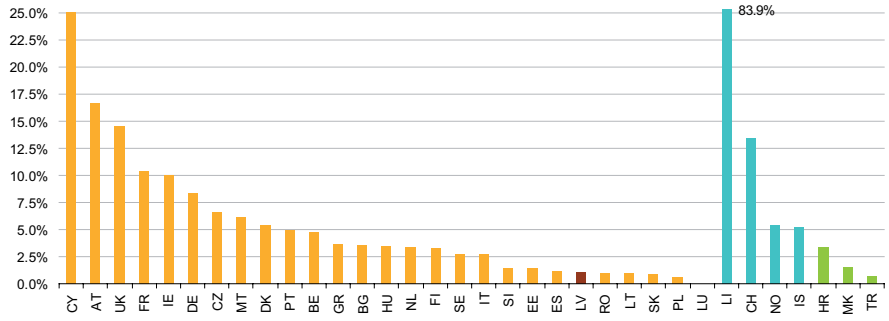
Source: Eurostat

5.5. Youth on the move – Latvian students studying abroad and foreigners studying in Latvia

It is believed that the international mobility of students in tertiary education contribute to the development of their skills and their employability. Spending a period abroad in order to study enhances language skills and the ability to work in different cultural environments. These skills are highly appreciated in the labour market. International mobility in tertiary education (of students in the first place but also of tertiary education institutions staff) also supports the opening up and modernisation of education systems. In this way it contributes to the goal of achieving smart, sustainable and inclusive growth in Europe. For this reason the promotion of international mobility has been a key feature of recent European policy initiatives in the field of education.

International mobile students are defined as those who move from one country to another with the purpose to study. However, data on international mobile students is not available for all countries. When data on mobile students are not available, data on students with a citizenship different from the country where they study can be used as a proxy. That is the case of Latvia, where data on mobility is not available and data on foreign students is used instead.

One of the indicators used to assess international student mobility is the percentage of students enrolled in the country who have moved to the country (or who are foreigners if citizenship is used). It measures inbound diploma mobility, students who move into the country in order to follow a complete tertiary education programme. It is however affected by immigration. Some of the foreign students did not move in order to study in the country as they were already living there.



Source: Eurostat

Graph 17. Inbound mobile students as percentage of all tertiary education students in the country

In 2007, Latvia had a relatively low percentage of foreign students with 1.1% (Graph 17). Only Romania, Lithuania, Slovakia and Poland had lower levels. The countries with the highest percentages were Cyprus, Austria and the UK with 25.1%, 16.7% and 14.5%.

The main origins of foreign students in 1999 were Israel, the Russian Federation and Sri Lanka. Together they represented 79% of the foreign students in Latvia. In 2007, Lithuania had become the main origin of foreign students in Latvia with an increase from 60 to 415. The Russian Federation continued to be one of the main origins with around the same number. The three main origins of foreign students in 2007 represented 61% of all foreign students in the country.

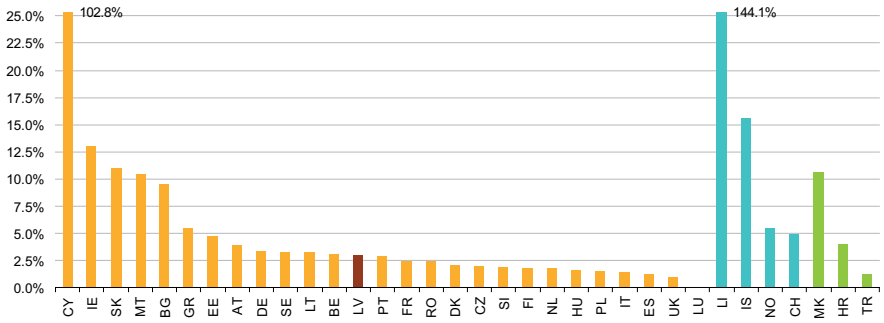
Table 7. Number of foreign tertiary education students in Latvia from the 3 main origins in 1999

Main origins in 1999	1999	2007
Israel	977	19
Russian Federation	383	382
Sri Lanka	95	73

Table 8. Number of foreign tertiary education students in Latvia from the 3 main origins in 2007

Main origins in 2007	1999	2007
Lithuania	60	415
Russian Federation	383	382
Germany	7	75

A second measure of mobility is outbound, i.e. those students who have left Latvia and went to another country in order to study.



Source: Eurostat

Graph 18. Outbound mobile students as percentage of all tertiary education students in the country

In 2007, Latvia's outbound mobility was 2.9% of the student population in Latvia. In the context of the EU, Latvia was a median country with as many countries with higher values as countries with lower values of outbound mobility (Graph 18). The country with the highest outbound mobility in

the EU was Cyprus with 102.8%. That means that there were more students from Cyprus studying outside the country than students studying in Cyprus. Another example in Europe was Liechtenstein with 144.1%. Such high outbound rations are more expected in small countries such as Cyprus and Liechtenstein, as sometimes the tertiary education systems do not have capacity for all the needs of the country.

Because outbound mobility in Latvia is much higher than inbound, Latvia's mobility flows are highly imbalanced.

The main places of study in Europe and other OECD member countries of tertiary education students with Latvian citizenship were in 1999 Germany, the United States and Estonia. There were significant increases from 1999 to 2007 in the number of Latvians in the two main destinations, Germany and United States. However, the most significant of all increases was in the United Kingdom. In 2007 it became the main destination of Latvian students (Tables 9 and 10).

Table 9. Number of tertiary education students with Latvian citizenship in the 3 main destinations in 1999

Main destinations in 1999	1999	2007
Germany	389	910
United States	246	440
Estonia	159	170

Table 10. Number of tertiary education students with Latvian citizenship in the 3 main destinations in 2007

Main destinations in 2007	1999	2007
United Kingdom	78	1 098
Germany	389	910
United States	246	440

6. Conclusions

Higher education plays a key role in Europe 2020 strategy. Together with research and innovation they form the so-called knowledge triangle fundamental for a smart, sustainable and inclusive economic growth sought for by Europe 2020. Two of the eight highlight targets of Europe 2020 are on education: rate of early leaving from education and training should be below 10% in 2020; at least 40% of 30-34 years years-old should have completed tertiary education.

In Latvia the 33.0% participation rate of the residents in tertiary education is higher than the EU average of 28.7% and it is increasing faster than the EU. This is reflected in a tertiary student population which has been increasing on average 4.3% per year. Early leaving from education and training is still relatively high compared with other European countries with 13.9% even if below the EU average of 14.4%. However it is decreasing at a fester pace

than the rest of the EU and if trend is kept Latvia will reach the 10% target defined for the EU for 2020.

Tertiary education attainment of the resident population in Latvia is at a median European level, with 30% of the 30 to 34 years-olds having completed a tertiary education programme. Still it has been increasing faster than the overall EU. In the year 2000, Latvia with 18.6% was below the EU average of 22.4%. By 2007 the country was much closer to the overall EU level of 32.3%.

Latvia's expenditure with higher education is relatively low when compared with other European countries. Public expenditure on tertiary education was 0.93% of the GDP in 2007, when the EU average was 1.12% and Latvia was amongst the countries with the lowest values in Europe. Expenditure per student was 4 544 Euros PPS when the EU average was more then the double with 9 102 Euros PPS.

Latvia's higher education level of internationalisation as reflected by the percentage of foreigners studying in Latvia was between the lowest is Europe. Only 1.1% of the tertiary education students in Latvia were foreigners and the main origin of those students was from surrounding countries, namely Lithuania and Russian Federation. On the other hand, much more Latvians go abroad in order to study. In the EU, EEA and EU candidate countries, as well as other OECD Member countries, the number of Latvians studying represented 2.9% of the tertiary education student population in Latvia, more than the double of foreigners studying in tertiary education in Latvia.

Zane Cunska
Juris Krūmiņš

Diverse Educational and Professional Paths of Tertiary Graduates in Latvia

Abstract

The purpose of this study is to analyse graduation trends, educational and professional paths from undergraduate and graduate study programmes in Latvia. Enrolment, graduation plans and paths of the University of Latvia students are studied in more detail. The authors analyse both the employment paths in connection with graduate's qualification received, and the changes of study directions between programmes. Time period of analysis covers the last 15 years with emphasis to the last five years. It is concluded that education and professional paths are becoming very divergent. An increasing share of individuals change study paths, accept non-sequential degree acquisition, and non-compliance between the degree and the job.

Keywords: graduation trends, education path, professional path.

1. Introduction

Further educational and professional paths of graduates form feedback for curriculum and institutional development purposes, and are an important source of information for higher education and labour market oriented reforms. Student and graduate statistics are gathered and analysed in Latvia on institutional, regional and national level, surveys and interviews are performed on regular basis. Self-evaluation and external evaluation reports are available publicly for all study programmes and institutions of higher education.[1] From the May 2011 Project supported by European Social fund "Assessment of higher education study programmes and proposals for quality increase" is carried out by the Latvian Council of Higher education. Analysis of further educational and professional paths of graduates would give additional insight to evaluation of higher education.

The purpose of this study is to analyse graduation trends, educational and professional paths from undergraduate and graduate study programmes in Latvia. Transition to doctoral study programmes is not analysed in this study. Enrolment, graduation plans and paths of the University of Latvia (the largest higher education institution in Latvia) students are studied more detailed. Time period of analysis is covering the last 15 years with emphasis to the last five years.

[1] See also: http://www.aiknc.lv

2. Data

Several data sources are used in this study: (1) Information from the databases of the Central Statistical bureau of Latvia (Central Statistical bureau of Latvia (CSB)); (2) Data from the annual Reports of the Republic of Latvia (RL) Ministry of Education and Research (Ministry of Education and Science RL, 2010); (3) Data from the first national-wide sample survey "Professional activities of graduates of higher and professional educational institutions" (further in the text – Survey I). 2,504 interviews of higher education institutions' graduates from academic years 2002/2003 and 2004/2005 were performed during July-November 2006. A sampling procedure was stratified systematic random sample. Strata were created according to the groups of study programmes (Krumins et al., 2007); (4) Results from the University of Latvia 2009 graduate survey (further in the text – Survey II). 2141 interviews were performed through the University of Latvia Information System (LUIS) between May 15 and June 6 2009. The respondents represented age group 20-60 years (90 percent of respondents were in age group 20-36 years) with average age 25 years. 68% of the respondents were graduates from undergraduate study programmes, 32% – from graduate study programmes. Questionnaire particularly included questions on study experience, factors affecting decision to continue or discontinue studies, current and expected employment etc. In this study 1442 graduates from both academic and professional undergraduate study programmes are included, 928 of which had decided to continue studies in chosen study direction; (5) Data from the University of Latvia Information System (LUIS). Transitions of students (by using individual data) between study programmes within academic years 2009/2010 and 2010/2011were analysed.

3. Enrolment and Graduation Trends

There are many determinants affecting number and composition of graduates from the higher education institutions – size and age composition of adult population; graduation from a general and vocational secondary schools; offer of state budget funded and paid study vacancies in different fields; level of stipends, loans, tuition and other fees and support schemes; employment during a studies; labour market demand and salaries in various sectors of national economy etc.

With widening higher education (Cunska, 2011) and increasing share of population involved in acquiring higher education, a role, content and attitude towards higher education is facing changes and new challenges. When a share of students in a younger age groups is approaching 50% (hence, also in Latvia), the higher education can be considered as universal.

A number of secondary school graduates in Latvia, mostly due to demographic factors (size of generations), till academic year 2006/2007 was increasing, except time period between 2003 and 2006 (Figure 1). Steep fall of fertility around 1990 and later affected size of cohorts of the secondary school graduates since 2007/2008. The highest size of birth cohorts in Latvia (more than 41 thousand births) was in 1986-1988. These cohorts entered an

age of graduation from secondary school in 2004 and later. Declining trend in vocational schools graduates since 2003/2004 is explained by diminishing interest in vocational education and with partial reorganization of vocational schools to higher education colleges.

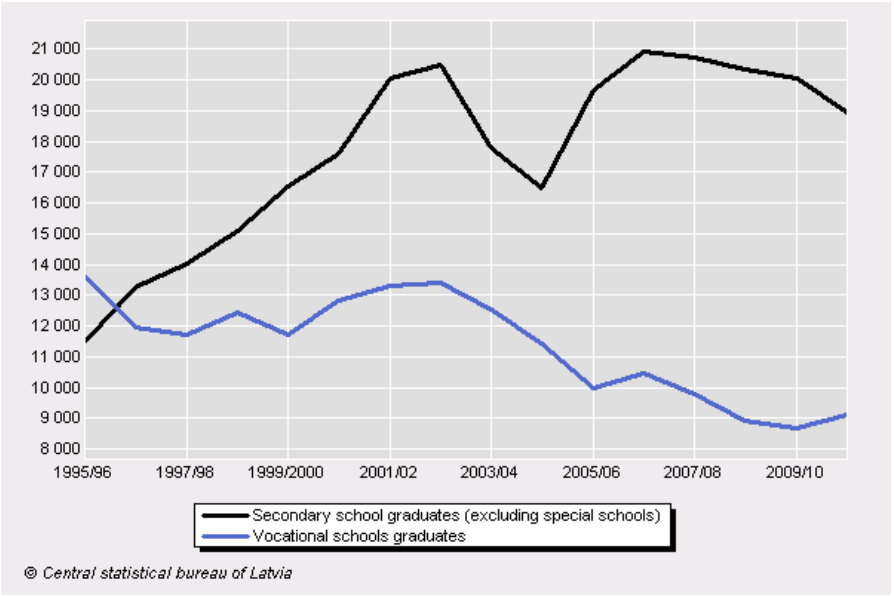


Figure 1. Secondary and vocational schools graduates in Latvia (at the beginning of the school year)

Declining size of demographic cohorts and as a consequence – number of pupils in secondary schools, is affecting and will affect in coming years enrolment in the institutions of higher education institutions and colleges (Figure 2). Diminishing role of the retraining activities through regular study programmes, for those who graduated considerable time ago, could be mentioned as a complementary factor of decrease of total enrolment in higher education institutions and colleges.

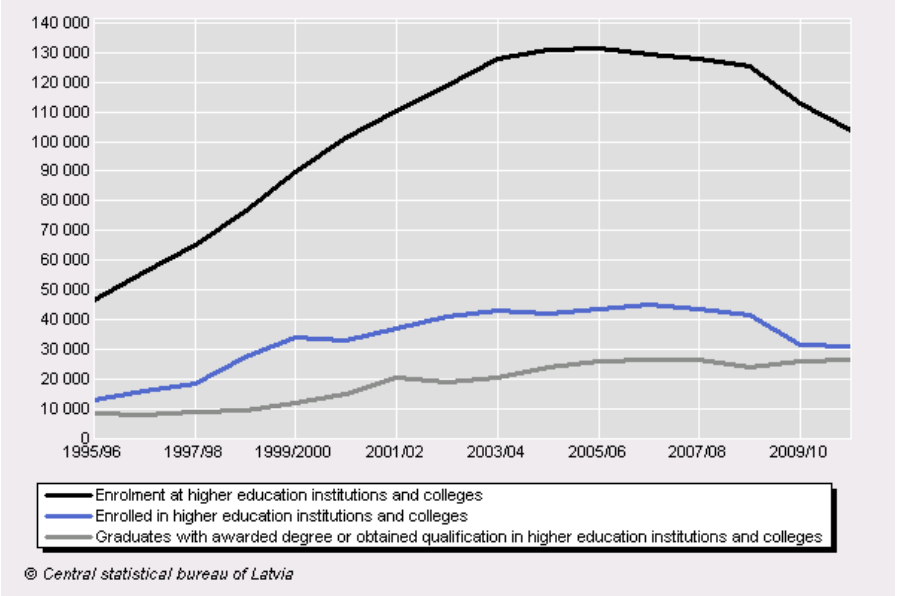


Figure 2. Enrolment and graduation at higher education institutions and colleges in Latvia (at the beginning of the school year)

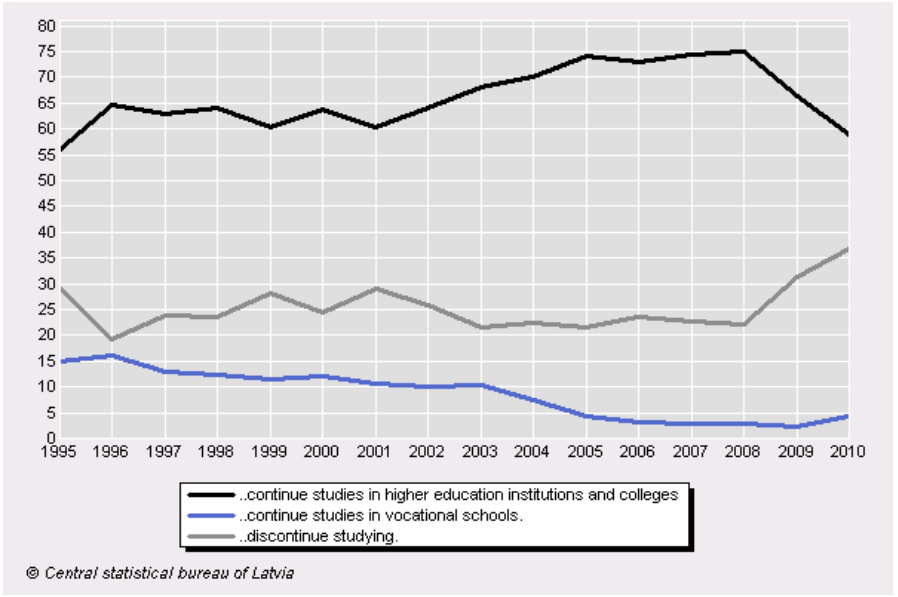


Figure 3. Latvia's secondary school graduates which continue or discontinue studying

Decrease of enrolment at higher education institutions and colleges to a certain extent was stimulated also by recession, which started in 2008. Economic crisis caused massive out-migration of adult population and reduced size of the secondary school graduates continuing studies in higher education institutions and colleges (Figure 3). Enrolment considerably was affected in part-time studies. Since the academic year 2007/2008 full-time enrolment decreased by 1.8 per cent while part-time enrolment fell by 41.2 per cent (see Table 1). It should be mentioned, that since 1997/1998 the trends were opposite. Enrolment in part-time studies grew faster than in the full-time studies, – in spite of the fact that part-time studies according to the legal regulations are almost hundred per cent covered by tuition fees.

Since mid-1990s growing motivation of applicants appeared to study social sciences, business and law. Growing number of a new study programmes in that field by state and private institutions of higher education institutions and colleges was offered, accompanied by expanding enrolment in the existing study programmes. Graduation since 1998 in social sciences, business and law has increased by factor 3.7, while total graduation in all fields of studies increased – by factor 2.8 (Table 2). Growing enrolment and graduation in sciences, engineering, health and welfare resulted from the increase of state budget funded study vacancies in those fields.

Table 1. Full-time and part-time studies enrolment in higher education institutions and colleges, Latvia (thousands, at the beginning of the school year)

	1997/ 1998	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011
TOTAL	64.9	101.3	110.5	118.9	127.6	130.7	131.1	129.5	127.8	125.4	112.5	103.8
Full-time	41.9	58. 9	66.6	72.3	83.7	80.1	77.2	74.4	72.7	72.7	71.2	71.4
Part-time	23.0	42.4	43.9	46.6	43.9	50.6	53.9	55.1	55.1	52.7	41.3	32.4

Source: http://data.csb.gov.lv/DATABASE/ Table IZG27 (accessed 26.11.2011)

Table 2. Graduates with degree or qualification in higher education institutions and colleges by education thematic groups

	1998	2000	2005	2010
TOTAL	9,347	15,009	26,124	26,545
education	2,177	3,896	4,479	2,206
humanities and arts	779	1,082	1,574	1,917
social sciences, business and law	3,871	6,320	14,123	14,417
natural sciences, mathematics and information technologies	440	993	1,244	1,336
engineering, manufacturing and construction	1,200	1,438	2,036	2,465
agriculture	233	162	285	229
health and welfare	519	536	1,254	2,456
services	20	582	1,129	1,500
thematic groups n.e.c.	108	-	-	19

Source: http://data.csb.gov.lv/DATABASE/ Table IZG29 (accessed 26.11.2011)

Among all graduates from the Latvian higher education institutions and colleges in the year 2010 63 per cent graduated from the full-time, but 37 per cent from the part-time study programmes (Table 3). In undergraduate studies that proportion correspondingly was 58 and 42 per cent, but in graduate studies – 76 and 24 per cent. Taking into account higher employment of graduate students than undergraduates, such peculiarity seems to be surprising. It should be explained mostly by flexible offer of full-time master degree classes in the evenings and week-ends by higher education institutions.

From the total number of graduates from institutions of higher education in Latvia ¾ are students from undergraduate study programmes and ¼ from graduate study programmes. Among all graduates from the Master degree study programmes the share of graduates from the state institutions of higher education is higher (79%) than among graduates from the first level study programmes (68%). Such dominance is determined by higher level of qualification of the academic staff in the state institutions of higher education, where more master and doctoral degree study programmes are offered than in private institutions of higher education, which started development mostly during the 1990-s.

Table 3. Number of graduates from the institutions of higher education in Latvia by forms of funding and educational level, 2010

	Undergraduate study programmes			Graduate study programmes		
	Full-time & part-time studies	Full-time studies	Part-time studies	Full-time & part-time studies	Full-time studies	Part-time studies
State institutions of higher education						
Total	13 689	9 041	4 648	5 118	3 893	1 225
Budget funded	5 530	5 472	58	2 676	2 621	55
Tuition fee	8 159	3 569	4 590	2 442	1 272	1 170
Juridical persons established (private) institutions of higher education						
Total	6 359	2 643	3 716	1 375	1 058	317
Budget funded	94	94	-	8	8	-
Tuition fee	6 265	2 549	3 716	1 367	1 050	317

Source: Calculated from: LR Izglītības un zinātnes ministrija (Ministry of Education and Science RL) (2010), *Pārskats par Latvijas augstāko izglītību 2010. gadā, Galvenie statistikas dati* (Overview about the Latvia's higher education in 2010, Main statistical data)

According to World Bank estimates, a number of pupils in primary schools by 2025 in Latvia will shrink by 25%, in secondary schools by 20%, but the most significant fall is expected in the number of students in higher education – by 40% (Chawia, 2007, Pp.217-261). Mizikaci has examined the phenomenon of the shrinking youth population in Europe and the associated effects on higher education. She notes that the severest declines will be observed in Estonia, Latvia, and Slovenia, where more than half of the 18-23 age group will disappear by 2050 (Mizikaci, 2007, Pp.71-85). For mentioned countries, immigration would not be enough to compensate negative natural increase,

especially because currently negative net migration is recorded. In all East European countries higher education is at risk because of low fertility rates and high emigration, as well as obvious failure to enrol significant numbers of foreign students. During discussions at the Salzburg seminar on the future of higher education was stated, that due to shifting demographics in Europe some higher education institutions will suffer from lack of students in the very near future, and that "the present and future body of higher education population should be examined" (Baumgartl, 2007). In the OECD 2008 report was emphasized that "demography has only recently become a concern in debate on higher education policy, and past growth of systems in OECD countries has had little to do with demographic changes (OECD, 2008).

During the last few years, in time of growing demographic crisis and recovery from economic crisis different scenarios of further development of higher education system and its funding are discussed on political and academic level. From the 1 August 2011 amendments to the Law on Higher education institutions are in force. New regulations concerning licencing of study programmes, accreditation of study fields, development of joint and double degree study programmes, recognition of previous learning and professional experience and other regulations should be issued by the Cabinet of ministers until the beginning of study year 2012/2013. Reduced number of study programmes and quality assessment procedures by study fields are expected to be introduced during the next few years.

4. Multiple Choices in the Study Paths

Multiple learning results in different areas of scholarship can be achieved through multiple choices in the study paths: (1) by studying in multidisciplinary undergraduate or graduate study programmes; (2) by combining two or more study programmes from different fields. The latter study programmes can be consecutive, i.e. undergraduate study programme is followed by graduate programme, or non-consecutive, when an individual acquires the same level study programmes one after the other or simultaneously (usually in the form of part-time studies).

Schematically, paths of choices to reach multiple learning results are shown in Figure 4. Four main study paths are distinguished. By using the first study path an individual acquires an undergraduate degree and/or qualification in particular field, and continues graduate studies in the same field in a successive programme. This still is the most common study path in Latvia.

An individual can choose an alternative path – to study in multidisciplinary or interdisciplinary study programme[2] (type C programme, Figure 4). At the end of studies a graduate has acquired multidisciplinary or interdisciplinary education in the respective fields. Graduate multidisciplinary study

[2] In this study authors would like to emphasize commonality – study content and study results that characterise more than one study field in contrast to one 'pure' study field in study programme. Therefore differences between multidisciplinarity and interdisciplinarity are not discussed.

programmes currently are more popular in Latvia, but several are designed for undergraduate studies as well. The most typical "mixed" undergraduate academic study programme at the University of Latvia is "Modern languages and business", offered jointly by the Faculty of Humanities and the Faculty of Economics and Management and several graduate study programmes – "European studies", "Baltic Sea region studies", "Environmental management", "Food science", "Spatial development planning" and other. Approximately 10 percent of students were studying in these programmes in the academic year 2010/2011 at the University of Latvia.

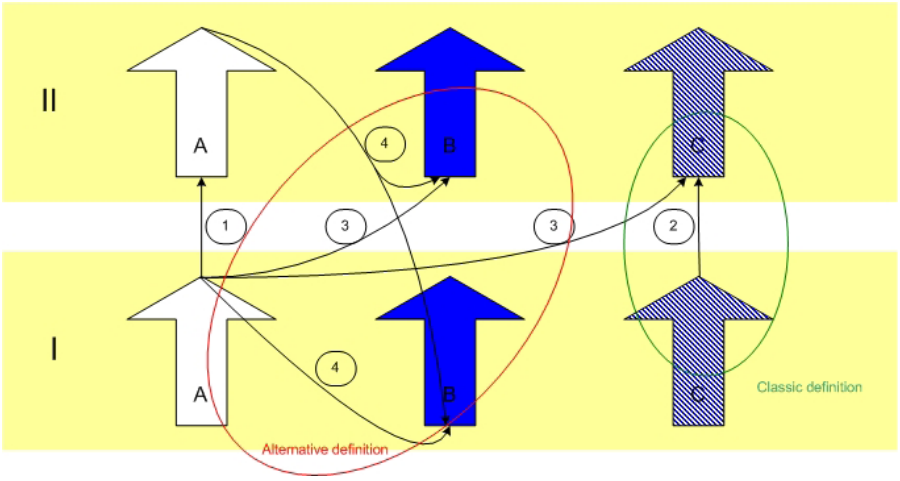


Figure 4. Schematic study paths representing transitions of graduates between study programmes to achieve multidisciplinary learning outcomes

Note: I – undergraduate study programmes (first level higher education); II – graduate study programmes (second level higher education). A and B – one concentration area study programmes (e.g. Economics, Chemistry etc.), C – multidisciplinary study programmes (e.g. European Studies, Food Science etc.). 1, 2, 3 and 4 – transitions / study paths of graduates between study programmes.

Alternative paths to acquire competences that are based in more than one study field are: 1) graduation from one 'pure' undergraduate study programme in a certain field, and continuation of studies in another 'pure' or multidisciplinary graduate study programme (path Type 3); 2) continuation of studies at the same or lower level that was graduated before, but in another field of studies (path Type 4).

It has to be taken into account that any study programme, including those that are defined in one particular field, partly contain disciplines from other fields. Accordingly, strictly there are no "pure - one discipline" study programmes. Though, the authors of this study regard these programmes as representing one field, based on degree or qualification awarded.

Nowadays transitional paths of Type 3 and Type 4 are rather popular. Implementation of the Bologna process and recognition of previous learning and professional experience are stimulating such way of further studies to

adapt to changing labour market needs. Enrolment in undergraduate study programmes of individuals, who already have at least one higher education diploma during the previous lifetime, is 4-7 percent of total enrolment in undergraduate studies (Table 4).

Table 4. Enrolled in undergraduate study programmes of Latvia's higher education institutions and colleges, having already at least one higher education diploma

	Academic years							
	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007	2007/ 2008	2008/ 2009	2009/ 2010
Enrolled first year students in undergraduate studies, having already at least one higher education diploma	1003	1615	1571	1888	1733	2441	1631	1035
% of total first year enrolment in undergraduate studies	3.2	5.0	5.5	5.7	5.0	7.1	5.0	4.2

Source: Ministry of Education and Science, 2010

Part of students, having already at least one higher education diploma, most probably, have graduated before transition to market economy with "old-fashioned" educational diplomas which are out-dated and inapplicable in modern labour market. Another part - recent graduates have decided to upgrade acquired competencies by studying in the other field of studies. For example, such path of transition can be formed, if a graduate from History or Physics study programme, having professional experience, choose to study Business administration or Management. One can mention plenty of similar examples.

Multiple choices in the study paths can be realised either by choosing graduate study programme in the same university or in the same institution of higher education with different fields of studies, or in other institution (in or outside country). Among enrolled master degree students at the University of Latvia in academic year 2010/2011 more than ¾ were graduates from the same Alma Mater (Table 5).

Table 5. Enrolled master degree students at the University of Latvia according to the graduation institution from previous study programme, academic year 2010/2011 (n=1668)

	Total	of which graduated from	
		The University of Latvia	Other institution of higher education
All students	100.0	76.5	23.5
Full-time students	100.0	78.2	21.8
Part-time students	100.0	39.2	60.8

Calculated from the data of the University of Latvia Information System (LUIS)

Among part-time Master degree students, which forms only five per cent of all enrolled graduate students, that proportion is much smaller – 39 per cent.

Continuation of education in other institution of higher education either in home country or abroad regardless the chosen field of education could be considered as advantage due to different academic and multicultural environment. Nevertheless, institutions of higher education in Latvia are offering to their own graduates' preferential enrolment paths by setting up particular *Numerus Clausus* for them, establishing faster enrolment paths by reduced fees etc.

5. Analysis of Further Study Paths

Still a dominant further study path in Latvia is to continue graduate studies in the same field like during undergraduate studies. It means that close compliance is observed between undergraduate and graduate academic degrees (i.e. Bachelor in History – Master in History). For the University of Latvia Master degree students compliance with the previous education diploma in 2011 constituted 84% (Table 6). To a lesser extent it relates to the part-time students, where that proportion is 77%.

Table 6. Compliance and non-compliance of chosen master degree study programme with the previous education for students of the University of Latvia in 2010 (n=1465)

	Total	Result from comparison of chosen master degree study programme with the previous education	
		Compliance	Non-compliance
All students	100.0	84.3	15.7
Full-time students	100.0	84.7	15.3
Part-time students	100.0	76.6	23.4

Source: Calculated from the data of the University of Latvia Information System (LUIS)

Different further study paths and undergraduate-graduate degree or qualification combinations are still insufficiently analysed in Latvian higher education institutions. Therefore the graduate student survey in 2009 was performed at the University of Latvia with more than two thousand interviews.

According to the undergraduate survey (Survey II) relatively high share (25%) of the University of Latvia 2009 first level higher education graduates, which intended to continue graduate studies, had chosen to study in another study field[3] (Table A1 in Appendix). The biggest share of those that would not change their study field is among law graduates (90%). There is only

[3] It should be noted that due to use of various databases the compliance between study fields is somewhat differently interpreted and is not directly comparable between LUIS register data and Survey II. The information from LUIS compares actual transitions between undergraduate and graduate studies in University of Latvia by comparing programmes that are known to be directly sequential (for instance, Bachelor and Master of Biology). This information captures only LU students at both levels. On the other hand, survey of LU graduates (Survey II), asks respondents about their plans to study in broader fields, and compares to the just-graduated field.

one undergraduate study programme in this field in the University of Latvia – professional bachelor study programme in law. Therefore one could expect rather high outflow to other fields of studies as well, which is not case. Apparently the close holding to continue studies in the same field is associated with a high prestige of the lawyer profession.

Only small part of law graduates choose to continue studies in Humanities and arts (3%), Commerce and administration (2%), Natural sciences, mathematics and information technologies (IT) (2%). On the contrary, there are more graduates from other fields who want to complement their education with law studies. Though, it has to be taken into account that master of law study programme entrance regulations foresee requirement of previous undergraduate education in law. Hence, apparently other field graduates plan to study law once again at an undergraduate level or in professional courses outside university programmes.

High share of those that would not change their study field is among graduates in Natural sciences, mathematics and IT (84%). This field of studies is rather wide and transitions are possible between study programmes within the field. Natural sciences, mathematics and IT is a rather specialised and complicated field for entrants from other under graduate study programmes and require specific knowledge. Only 3% of Commerce and administration and 2% of Law graduates choose to continue studies in this field.

Somewhat less than in above mentioned fields – 79% of Commerce and administration graduates choose to continue studies in the same field as they have graduated from, but 21% plan to continue studies in another field, including 7% in Social, human behaviour, information and communication sciences, 4% in Law. Commerce and administration is a popular area to continue studies after graduation from other fields. This is a result of several reasons – offer of study programmes in this field is high both in state and private institutions of higher education, requirements to enter these programmes are not restrictive regarding previous degree or qualification, competency in economics and business is widely accepted in the labour market. Continuation of graduate studies in social sciences is rather easily to combine with employment, especially in the part-time form. For the same reasons change of study path pattern is similar for also for Social, human behaviour, information and communication sciences graduates.

29 percent of Health care and social welfare field graduates choose to continue in another field. As this field include medical studies, healthcare and social services, it is a very inhomogeneous field. It is possible that most of changes happen exactly after social work programmes, that require knowledge of other fields, but also graduates from medicine, possibly, are willing to engage in business in medicine rather that hospital work, for example, trade of medicines and equipment, pharmacy, establish private healthcare centres etc., for what knowledge in business and communications are important.

Almost one half of Pedagogic education and educational science and almost one third of Humanities and arts undergraduates have decided to change a study path to other graduate programmes. There could be several reasons for such pattern. These are fields with relatively many budget-funded study

places and entrance to these study fields is comparatively easy from the point of view of prerequisites. Therefore Pedagogic education and educational science and Humanities and arts programmes more likely are used as the first step towards graduate study programme in other area programme in such a way widening horizon of knowledge and obtaining multiple competencies demanded by the labour market. Rather small portion of undergraduates from other fields (2-6%) have decided to continue graduate study path in Education and to become a teachers.

Continuation of education and retraining is realised not only through formal education but through informal education and different professional retraining courses (Table 7). A role of informal educational and retraining activities is higher between graduates from the 2nd level professional higher education (after obtained before at least one higher education diploma) and Master degree.

Table 7. Continuation of formal and informal education in Latvia (per cent of graduates from previous level of education, per cent)

	Formal education	Informal education	Professional retraining courses
1st level professional higher education (college)	47	44	26
2nd level professional higher education (after completed secondary education)	38	49	31
Academic Bachelor degree	63	43	26
2nd level professional higher education (after obtained higher education diploma)	23	61	43
Academic Master degree	19	66	44

Source: Survey I, n=2491. Note: The sum of proportions in per cent exceeds 100 per cent due to overlapping of answers concerning continuation of different forms of education

Decisions concerning further path to graduate studies are made in many cases with a time lag, especially when part-time studies are chosen. From the University of Latvia enrolled master degree full time students in academic year 2010/2011 ¾ where undergraduates of the same year, while for part-time graduate students that proportion was 1/4 (Table 8).

Table 8. Enrolled master degree students at the University of Latvia according to the graduation year from previous study programme, academic year 2010/2011 (n=1668)

	Total	of which graduated in the years		
		2010	2001-2009	1978-2000
All students	100.0	72.6	22.5	4.9
Full-time students	100.0	74.8	21.1	4.1
Part-time students	100.0	25.7	52.7	21.6

Source: Calculated from the data of the University of Latvia Information System (LUIS)

More than one half of enrolled part-time Master degree students have decided to continue graduate studies within interval 1-9 years, but approximately 1/5 of them in ten and more years after completion of undergraduate studies. To analyse study paths with regard to changes in educational and professional profiles, it is necessary to undertake in-depth longitudinal studies covering sufficient sample of graduates and time after completion of undergraduate studies.

6. Compliance of Profession to Acquired Qualification

Nowadays the individuals' perception about career has changed. There is a tendency that people more often orient themselves to the so called portfolio career, when a person takes increasing responsibility about his/her own professional development, and the work career is not any more necessarily connected to one enterprise (Jaunzeme, 2011). Employment of graduates in particular profession one year or three years after graduation (named "current profession") is analysed using measurement of the respondent's status at the moment of the survey (Survey I).

Entrance of graduates to labour market in compliance to acquired qualification is determined by several factors – both objective (demand of specialists, skills acquired during studies, provided remuneration etc.), and subjective (dissatisfaction with chosen profession and unwillingness to work in it, requirements towards work environment in general etc.). In order to assess compliance of the current profession with acquired qualification dichotomic variable "compliance of the current profession" was created and its value was equal to one, if graduate was employed according to acquired qualification, or equal to zero, if graduate was not employed according to acquired qualification. In general 73% of graduates were employed according to acquired qualification.

Almost all knowledge acquired during studies was used by 80% of those graduates who were employed in compliance to their qualification. On the contrary, more than one half (53%) of graduates who were not employed in compliance to their qualification use nothing or almost nothing of knowledge acquired during their studies. There was no significant difference between males and females in job selection or employability in compliance to acquired qualification. The higher education level was reached by an individual the higher was possibility that he or she had a job that corresponds to acquired qualification – 64% of graduates with bachelor degree and 81% of graduates with master degree.

The highest salary and competitiveness was presented by graduates who studied in English either in Latvia or abroad. Graduates employed in large cities and in capital Riga more often accepted job that does not correspond to their qualification. Probably it is not only due to fact that there is bigger offer of jobs but also due to larger supply of better paid or more attractive vacancies, or due to fact that part of graduates whish to accept jobs in large cities regardless their qualification.

In order to assess compliance of current profession to qualification as well as to identify its determinants multifactor analysis and multiple logistic regression was used, where dependent variable was "Compliance of current profession to acquired qualification". The following factors were identified as statistically significant: expected remuneration at education programme group and level, teaching language, continuation of studies after graduation, age of respondents and their parents' education. A time for finding a job after graduation was significantly affected by the education programme group, funding (state budget or tuition fee), employment during studies, gender and age of graduate.

The level of education statistically significantly affects entrance to labour market already during studies – the higher education level the more often students start working during studies. The higher education level that graduate has reached the larger the possibility that he or she will work according to acquired education.

Table 9. Net salary (LVL) of employed graduates according to compliance to acquired qualification by education programme groups

Education programme groups	Average	Profession comply with qualification	Profession does not comply with qualification
Pedagogic education and educational science	227	218	277
Humanities and arts	305	287	327
Natural sciences, mathematics and information technologies	356	370	335
Agriculture	246	240	276
Health care and social welfare	287	266	394
Services	382	348	294
Commerce and administration	361	373	327
Law	419	505	271
Engineering sciences and technologies	382	413	374
Manufacturing and processing	320	395	*
Architecture and construction	469	446	*
Social, human behaviour, information and communication sciences	344	376	305

Source: Survey I, n=2491. Note: Table shows net salary in Lats (including payment for overtime hours, "pay envelope" salary to avoid taxes, etc.) in the previous month. Compliance to qualification was assessed by authors of study. Asterisk marks groups that were too small to conclude about statistically significant differences

The higher remuneration in the profession that corresponds to qualification the higher was possibility that graduate would wish to work in compliance with his or her qualification (Table 9). However, there are exceptions. Graduates in pedagogue education, health care and social welfare, and agriculture accepted employment in compliance to their qualification regardless expected remuneration in these fields. Probably, mentioned graduates have higher loyalty to their profession, higher level of enthusiasm, as well as higher share

of specialized knowledge and knowledge that can be hardly applied in other fields (especially in case of health care professions). It is also probable that the students have started these studies already after employment in these fields and after graduation continue in the same workplace. On the contrary, law, engineering and technology graduates more often than it could be expected choose to work in professions that are not related to their qualification. Graduates who studied in Russian language more often than those who studied in Latvian chose a job that did not correspond to their qualification.

Graduates, who continued studies in other education institution more often than those who did not, choose to work in professions that did not correspond to their initial qualification. It is not a surprising because change of education institution more often is connected with change of education field. Many of such graduates are employed in compliance to their last acquired qualification or in compliance to education field in which they were studying.

Older graduates choose a profession according to their qualification more often than younger graduates. It could be related to the facts that older persons are more considered in choice of profession, they have lower level of desire to change conditions, they often have already worked in the corresponding area prior their studies and planned to rise a qualification.

After returning from abroad, graduates of both higher and vocational education institutions earn substantially more than those who have not worked abroad. There are two main reasons. Firstly, work experience abroad is being assessed higher in the labour market. Secondly, people who have worked in countries with higher salaries have higher requirements toward remuneration.

7. Conclusions

Declining size of birth cohorts and as a consequence number of graduates from the secondary schools is affecting enrolment in the institutions of higher education institutions and colleges. Since 2004/2005 number of graduates with awarded degree or obtained qualification in higher education institutions and colleges has stabilized above the 25 thousand and in coming years is expected to decline. From the total number of graduates ¾ are students from undergraduate study programmes and ¼ from graduate study programmes.

Higher education empower individual to adapt to fast social and technological changes. It manifests in the content of study programmes, in breaking down barriers between disciplines and study programmes, between formal and informal education. Efficient way to achieve greater adaptation possibility in the changing socio-economic environment and to obtain higher flexibility in the labour market is the change of educational path between different fields. Change of study field, acquisition of competencies from different professional areas is a peculiarity of a present-day situation.

Education paths nowadays are becoming very divergent. Most of individuals still undertake conventional way of educational career path - after secondary education choose their professional field, acquire undergraduate diploma,

sequentially continue to graduate studies in the same field and then exit to labour market by getting a job in compliance with their education. Nevertheless many individuals are changing study paths, accept non-sequential degree acquisition, and non-compliance between the degree and the job.

Approximately 1/5 of undergraduates are continuing or planning to continue graduate studies in different field of which they have completed. It is plausible to assume that this proportion is even higher, if to take into account the students interrupting and continuing studies in the programme from another field. In general, Commerce and administration and Social, human behaviour, information and communication sciences are net recipients at graduate studies level after changes of study field of undergraduates. Nevertheless it is hard to assess how prevalent are the different study paths without explicit longitudinal study of further educational and professional careers of graduates.

Individuals take more responsibility about their own education for their own career. They tend to perceive their education as a puzzle, formed by various pieces in lifelong perspective. In this context a change of study fields should be evaluated positively, because as a result the horizon of graduates is wider, competencies more different and adaptation to changing demands of labour market more elastic. The higher remuneration in the profession that corresponds to obtained qualification the higher possibility that graduate would wish to work in compliance with his or her qualification.

Multidisciplinarity and changes of study paths between fields after graduation potentially has a negative aspect as well. With a wider scope of knowledge, it is difficult to acquire equally profound competencies as it is when concentrating all efforts to one particular field. Therefore a compromise should be reached between graduate courses that build on previous knowledge from particular field, and accessibility of programmes to entrants from other fields by offering catch-up study courses and modules.

Acknowledgements

This study benefits from using data from research projects with authors' participation. Particularly, the Ministry of Welfare Labour market project "Professional Activities of Graduates of Higher and Vocational Education Institutions after Graduation" (EU ESF project No VPD1/ESF/NVA/04/NP/3.1.5.1/0001/0003), and the University of Latvia Research grant "Midterm enrolment projections for student number and structure taking into account student motivations and expectations with respect to higher education". Authors thank I. Leduskrasta for valuable support with LUIS database.

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Appendix

Table A1. Distribution of the University of Latvia graduates from undergraduate study programmes by chosen graduate programmes for further studies, 2009 (per cent of graduates from undergraduate study programme)

Undergraduate study programme	Graduates - total	of which by chosen graduate programmes for further studies									
		Commerce and administration	Law	Social, human behaviour, information and communication sciences	Pedagogic education and Education science	Humanities and Arts	Natural sciences, mathematics and IT	Engineering, Manufacturing and Construction	Agriculture	Health care and social welfare	Others
Commerce and administration	**100**	79	4	7	0	3	3	1	0	2	1
Law	**100**	2	90	1	0	3	2	0	0	1	1
Social, human behaviour, information and communication sciences	**100**	14	3	70	2	7	0	2	0	2	2
Pedagogic education and Education science	**100**	4	0	11	51	33	0	0	0	0	0
Humanities and Arts	**100**	11	4	12	5	64	0	1	0	3	0
Natural sciences, mathematics and IT	**100**	3	2	1	3	1	84	3	1	3	1
Health care and social welfare	**100**	8	1	11	6	0	1	0	1	71	0

Source: Calculated from the Survey II data. Groups of study programmes are composed according to digit 3 and 4 classification level (Ministru kabinets (Cabinet of Ministers), 2008). Given the high share of students in the social sciences, for the purpose of this study, Social sciences, business and law thematic group is disaggregated in thematic fields, but 'Services' is included in the group 'Others'

Ilona Kunda
Nils Muižnieks

Resource Base for the Social Sciences and Humanities in Latvia: Sufficient for Expecting Rapid Development of the Field?

Abstract

The authors of the article analyse resources available for developing social sciences and humanities (SSHs) in Latvia, pointing out key disproportions in resource availability and uptake as well as promising new trends in the field. The article uses data from the recent Monitoring European Trends in Social Sciences and Humanities (hereinafter – METRIS) II study as well as other studies on the resources and contribution of SSHs in Latvia. In addition, the article maps out some experience of SSHs in interdisciplinary research, which appears promising. The authors emphasise that increased activity in utilising the available resources and in defining the national research priorities is important for SSHs, as they can become more efficient in performing their public role – analysis of the rapidly changing and controversial societal processes.

Keywords: SSHs, public role, interdisciplinary.

1. Introduction

Without doubt, efforts to implement inter-, multi- and trans-disciplinary research practices are contemporary – even though these practices are not invented just yesterday (for example, Shinn, 2002) and pointing out the shortcomings of narrow specialisation of scientific disciplines has already for quite a while been considered the "right tone". At the same time, it is clear that any practices of fusing the boundaries cannot be implemented without the *elements to be fused*, without the existence of strong, distinctive disciplines (Muller, 2000). Therefore, in addition to the facilitation of innovative practices that allow for crossing borders between separate disciplines, there is a persistent interest in how successful the development of specific disciplines is.

How strong are the social sciences and humanities (hereinafter – SSHs) in Latvia at the beginning of the 21st century? An attempt to find out this at least to a certain extent was made within the project Monitoring European Trends in Social Sciences and Humanities (hereinafter – METRIS) II, conducted by researchers at the Advanced Social and Political Research Institute (hereinafter – ASPRI) of the University of Latvia from August to October 2011. The assessment was carried out on the basis of analysing the political, financial and institutional framework within which the social sciences and humanities operate in Latvia.

Commissioning of such analysis under a comparative project supported by the European Commission is a signal of the Commission's considerable conceptual interest in the SSHs research, emphasising the need to promote their development in order to find solutions to the challenges of the changing social, economic and political environments that natural sciences are incapable of providing. Such analysis is necessary for creating more efficient policy instruments to support SSHs. Have science policy makers in Latvia up to now inquired on the subject of the availability of resources and the operational framework for the development of SSHs as a basis for any achievements?

2. Previous Assessment

In the Latvian science policy reports, one can find only a few reserved judgments regarding the development of SSHs. A telling example of the attitude so far is the main document for the previous period of making use of the Structural Funds (National Strategic Reference Framework 2007-2013, p.83), which assesses the situation of sciences in Latvia as follows: "The Latvian R & A [research and development] potential should be created and developed first of all on the basis of the existing and maintained scientific schools: in organic chemistry, medicinal chemistry and genetic engineering, physics, material sciences and information technologies. These schools and their research potential correlate with the previously provided data on scientific publications and patents in these disciplines." This document does not even mention the humanities and social sciences. The main performance indicator is publications only. No wonder that the Structural Fund tenders derived from this document were not at all friendly to SSHs.

Nevertheless, already in 2009, the National Development Council discussed the report of the Ministry of Education and Science (hereinafter – MES), containing a reserved statement that there is a potential "**in individual social science disciplines**" (without naming them).

The relevant policy measures are taken on the basis of the analysis of resources and accomplishments of SSHs. In what way is such analysis performed in Latvia? Generalisation of specific indicators (human resources, facilities, publications and projects) within the context of base funding allocation carried out by MES can be deemed a certain assessment measure. Likewise, information is collected within the context of accreditation of study programmes. In addition, the time has come in 2011 to carry out the international evaluation of scientific activities of academic institutions (in accordance with the Law on Scientific Activity adopted in 2005, such evaluation must be performed every 6 years). However, gathering of data **does not necessarily mean data analysis**. There is no question that an extensive evaluation of resources and analysis of performance results of the social sciences and humanities in Latvia has not taken place so far.

At the same time, the METRIS study was not launched from scratch. Over recent years, a number of researchers have presented their views on the

situation of SSHs in Latvia, analysing resources and accomplishments (either both or one of these aspects).

One of the best known examples of critical analysis of SSHs is the study of Vjačeslavs Dombrovskis "Is everything alright with higher education in Latvia?" in which the author indicates that the productivity of social sciences in terms of internationally quoted publications is drastically low. To quote the author, "in 2008, the Estonian scientists published almost three times as many, and the Lithuanian scientists – about five times (!) as many SCI publications than their colleagues in Latvia." The author admits, though, that data concerning publications should be analysed with caution, and conclusions about the intellectual capacity of social scientists should not be immediately made, mentioning the fact that the number of SCI publications does not affect the researchers' salaries in Latvia as a possible explanation of the low productivity of internationally quoted publications (*also quite a narrow explanation – I.K.*). This study is often referred to as an authoritative analysis of the situation of SSHs, even if V. Dombrovskis does not analyse the overall situation of SSHs, limiting the analysis to just one of the SSHs performance results.

Mention should be made here of an important, though often overlooked, contextual factor for the SSHs analysis, i.e. the unique contribution of SSHs that clashes with the ultimate goal of international publishing. That is to say, SSHs also have a mission towards the public, and performance in this respect cannot be measured in terms of academic publications. For example, Prof. Maija Kūle writes in the newspaper *Zinātnes vēstnesis*: "In social sciences, important criteria besides publications are participation in international projects – especially in framework programme projects – and commissions that prepare national development scenarios and policy as well as public explanatory activity in the society, which is an important indicator distinct from quotability. (...) Evaluation of the performance results of SSHs must for the most part be based on the conditions of uniqueness, quality, singularity and cultural-historical significance, not so much on quantitative, technologically pragmatic considerations."

Prof. Aivars Tabuns has problematised the topic of the role and contribution of social sciences as well as resources necessary for their development in a number of publications, including under the Latvian Council of Sciences (hereinafter – LCS) project "Interaction of economics and culture of Latvia in the European Union in the process of developing a knowledge-based society" and also in several publicly available articles that aroused resonance ("Social knowledge as burden?", "Notes of the one running in a hustle" et al.).

In fact, A. Tabuns has delineated several of the topics also touched upon in the METRIS project. He analysed various Latvian science policy instruments supporting social sciences and the impact of tender evaluation criteria. He pointed to the "radical difference of the national science policy from the science policy practices in other EU countries." He noted the insufficient support for participation in comparative EU collaborative research projects as a particularly negative trend, while such participation is an important instrument for the development of science.

The 2008 publication of Marija Golubeva "Between development and self-isolation: humanities departments in Estonia and Latvia in the quest for survival strategies" is distinct and provocative. Although the focus of the study was *cooperation with the public*, the author analysed the problem by taking into account the structural and financial constraints of humanities. The author highlights as important such factors as the low convergence of academic communities in humanities and its political consequences, the low financial support from LCS for some areas, ideologically biased funding allocation and the humanities' "fragile status in the hierarchy of sciences" (Golubeva, 2008, p.14). The specificity of resources is characterised as a factor contributing to the implementation of the "survival strategies" in humanities.

3. METRIS Objectives

The examples considered above indicate that several dilemmas are inherent to the situation with the social sciences and humanities in Latvia in recent years, and their contributions are valued in the public discourse irrespective of the resources available. Therefore, the objective of the METRIS team to mark out a broader framework for the activities of SSHs and their main trends appeared all the more topical.

Within the framework of the METRIS study, the most current topics stated and supported by SSHs, the political and institutional system, types and flows of funds, trends in the allocation of State subsidies, major "players," the existence of a culture of evaluation, publications and international cooperation were analysed.

To concede, the approach of METRIS was quite traditional: there were no inquiries about the practices of crossing the boundaries of disciplines (or support to such practices) and about the conditions or support for achieving the objectives that are unique to SSHs and focused on the society. Nevertheless, the proposed framework seems to be sufficiently structured to provide the opportunity for assessing preconditions for the development SSHs.

This was already the second round of METRIS, where Latvia also joined the "old" EU Member States. Delineating the context for the development of SSHs in Central and Eastern Europe, the previous integrated METRIS report gives a rather bleak picture of a hierarchical institutional structure, Communist ideological legacy, poor working conditions and low pay, which contribute to brain drain, particularly noting that the development history of social sciences in Central and Eastern Europe is very short, thus emphasising that time is also a resource, and SSHs have not had a chance to have a plenty of it.

The full version of Latvia's report will be available on the project website www.metrisnet.eu. In this article we would like just to highlight briefly some of the trends with regard to such aspects as the data on SSHs, representation of SSHs in making decisions on the priorities and allocation of funding for sciences, share of SSHs in the "resource pie" and their activity in the field of

international cooperation. In conclusion, we will also give some comments on the trends of SSHs in interdisciplinary cooperation.

4. General Data on Resources and Contributions of the SSHs Field

The METRIS study showed that, to date, neither MES nor the Central Statistical Bureau (hereinafter – CSB) have collected and analysed the data on resources and contributions of the SSHs field. For example, CSB only collects data on research activity by sectors (business, State, higher education).[1]

Furthermore, trying to obtain information regarding the amount of base funding earmarked for SSHs in 2010, researchers were faced with the fact that MES was unable to provide such data, as it operates with figures reflecting the higher educational institutions as a whole (the base funding is further redistributed to specific departments within higher educational institutions). MES aggregates and makes public only data on the institutions receiving the base funding. Through correspondence with the MES officials, researchers obtained a figure that was derived from the 2011 base funding allocation sheet made public and marking out individual higher educational institutions generally related to the field of SSHs (for example, the Latvian Academy of Music, the University of Latvia Institute of Philosophy and Sociology etc.), at the same time, for unknown reasons, leaving out the University of Latvia, Latvia University of Agriculture, Riga Technical University, Riga Stradiņš University and Daugavpils University. As a result, a figure of LVL 550,136 was arrived at, and it does not convey much.

It should be noted that the "Action plan 2010-2011 for implementing the science and technology development guidelines" specifies the SSHs base funding reference amount as LVL 469,064, which most likely does not have to do with any analysis or planning, because MES indicates the actual subsidy for SSHs in 2011 also only in an approximate value (at a level of hundreds of thousands of lats).

Such a shortcoming, though, is not something unique to Latvia. The summary report of METRIS I (2009) also pointed out that there were information gaps in all countries covered by the study. Unfortunately, these information gaps are not impartial. Even if the general data on resources and contributions of the SSHs field with regard to the funding earmarked and values created are not provided, yet, judgments (often negative) regarding the usefulness of these scientific disciplines are voiced in the public sphere and corresponding policy measures are planned.

The fact that the first database collecting the data on funding and performance according to fields of study is going to be created within the framework of evaluation of the fields of study launched by the Council of Higher Education (hereinafter – CHE) and supported by the ESF project "Evaluation of the higher education study programmes and proposals for their quality

[1] See also: http://www.csb.gov.lv/statistikas-temas/zinatne-galvenie-raditaji-30423.html

improvement" may be deemed a promising occurrence. Regrettably, it is not certain whether this database will be maintained after the project (as it is being created for the needs of this specific evaluation).

5. Determination of National Priorities for Sciences and Balanced Development of the Sector

The METRIS study showed that SSHs are poorly represented in decision-making, in determining the national priorities for sciences and in developing the science policy. At the same time, some recent trends in the policy decisions adopted are positive (though not always explicable).

Prioritisation that takes place every 4 years is essential for the development of SSHs. The Cabinet of Ministers regulation, governing the granting of public funds for fundamental and applied research, national research programmes etc. for the period 2010-2013, is currently in force. LCS makes proposals for setting the priorities (Cabinet of Ministers of the Republic of Latvia (RL), 2009). LCS is composed of 22 members (elected for 4 years), only 4 of which represent SSHs (currently 2 represent humanities and 2 – economics). For making the proposals, there is a special expert committee established under LCS. From the 7 members of this committee, only 2 represent the disciplines of SSHs (economics is the currently represented discipline).[2]

Why is it so that the only thematic area within the effective national research programmes, where SSHs can take part, is focused on the State language and cultural heritage? Does this restriction accurately reflect the country's strategic research needs? Analysing the National Development Plan as the main guideline for the country's development, other topics come into sight as the main challenges: demography, migration, regional development, knowledge-based society etc. The research priorities set within the EU context are also incomparably wider in scope: ageing, citizenship, social innovation in the labour market, sustainable environment etc.

An assumption can be made that the academic communities of social sciences and humanities are quite fragmented and in many cases unable to be united in defence of specific thematic area even if the researchers very well know what is important and topical. M. Golubeva also pointed to this fact in her analysis of humanities departments.

In the last couple of years, the institutions of SSHs have managed to slightly improve their positions, demonstrating the relevance and quality of their studies in an organised and purposeful manner. The first such case was in March 2009, when a decision of ESF on allocating funding for activity 1.1.1.2 "Attraction of human resources to science" was challenged (from 0 supported projects to 1).[3]

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[2] See also: http://www.lzp.lv/index.php?option=com_content&task=blogcategory&id=60&Itemid=122

[3] See also: http://www.viaa.gov.lv/lat/strukturfondi/zinatne/zinatnes_apakshsad/?tl_id=363&tls_id=82

On 25 May 2009, the Minister for Education and Science Tatjana Koķe reported to the Council of the National Development Plan that not only such subjects as language and cultural-historical heritage but also **the analysis of the processes of social, legal and economic development of the society** should be set as research priorities. At last!

In 2010, a determined action of the consortium of social sciences (in quite an intense dialogue with the consortium of humanities) also resulted in a successful implementation of the national research programme "National identity" (1 of 5 programmes).

This event was followed by an even more important turning point to a broader thematic scope in establishing national research centres (hereinafter – NRC). As a result, from 9 NRCs, 2 were established in the fields of SSHs, covering such thematic areas as, e.g., socioeconomics, public governance and creative technologies under Latvian studies. Cooperation strategies created and approved by the partners also delineate a much broader and more detailed thematic scope.

On the one hand, there is no doubt that, in the case of ESF and national research programmes (NRP), proactive and persistent action carried out jointly by representatives of various disciplines was decisive for the broadening of the thematic field. On the other hand, the formally established national priorities, in terms of being a basis for the allocation of resources, did not turn out to be either balanced or forward-looking, at least in the period from 2010 to 2013, and strict adherence to them would be detrimental for SSHs.

6. Share from the "Resource Pie"

To date, SSHs have received a disproportionately small (compared to natural sciences) share from the public funding for science – partly because the selection criteria have been defined in a biased way and partly due to the inactivity of SSHs in availing of the existing opportunities. A positive trend in this regard is the processes of 2010-2011, resulting in the creation of NRCs in which the SSHs already have a comparatively greater share.

The analysis of the results of both State grant and structural fund tenders shows that natural sciences have clearly been given preference in the allocation of funding so far. For example, in State-funded fundamental and applied research, only 1/6 of the available funds have been allocated to the projects of SSHs; in the national research programme – to 1 project out of 5. The subjects of economics and Latvian studies have prevailed among the winning projects, with quite a narrow range of grant recipients. Acquisition of structural funds has been even less successful – from the 35 projects supported under the ESF project "Support for the development of human resources in science," only 1 project was supported in SSHs; under the ERDF project "Support for international cooperation," 3 projects out of 20 represented SSHs; only the process of creation of NRCs was relatively more beneficial for SSHs: 2 projects out of 9.

The funds of the bilateral financial mechanism of the government of Norway have not been acquired much over the last five years: only 3 out of the 17

academic study grants were related to SSHs; in other thematic priorities, there was only 1 supported project[4] out of 10. SSHs have not used the opportunities in the priority "Cross-border cooperation," where 10 projects were supported for a total amount of roughly 2 million Euros (only 1 of these projects had a research component, though not in the field of SSHs).

Presently (for the period from 2009 to 2014), 3 million Euros are allocated by the bilateral financial mechanism of the government of Norway for bilateral cooperation projects – for the time being without defined priorities as to their content. It is an opportunity for SSHs to be proactive.

7. International Cooperation

Analysing the available data, one can conclude that SSHs use the opportunities of international cooperation relatively little, in particular the opportunities of EC framework programmes. However, there is a nuance: practice shows that researchers more involve in research projects as individuals, and projects are rarely applied through a higher educational institution or a structural unit thereof. For example, only 4 projects of SSHs are currently implemented within the 7th Framework Programme of the European Commission.

Moreover, activity is likely to remain low during a few upcoming years if we consider the example of the University of Latvia, where only around 10% of approximately 60 prospective international cooperation projects supported by ERDF are in the field of SSHs.[5] In these cases, professors and leading researchers themselves, on their own initiative, applied for the status of eligibility to prepare new project proposals on a paid basis.

Despite the low overall activity to date, one can also see that, when international cooperation gets underway, projects follow one after another, and scientific institutions have successful cooperation. A good example is the University of Latvia Institute of Philosophy and Sociology, which has a long-term experience of participation in comparative international studies.

Thus, one can conclude that international cooperation largely depends on already existing international contacts, where leading researchers and professors of scientific institutions play a key role. The available support mechanisms (the abovementioned ERDF project) currently create truly supportive working conditions for establishing consortiums and for developing the project proposal ideas.

Establishing of NRCs also is a promising measure, as creation of a state-of-the-art infrastructure in those fields that require special equipment and software will in the long run enable SSHs to start working at the European research level and become interesting to foreign researchers as well.

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[4] "Research potential of higher educational institutions for facilitation of regional development" (LV 0054), a project of the Faculty of Social Sciences of the University of Latvia, submitted in the priority of facilitation of regional policy and economic development.

[5] ERDF activity "Support for international cooperation projects in science and technology." Available at: http://www.viaa.gov.lv/lat/strukturfondi/zinatne/zinatnes_apakshsad/?tl_id=360&tls_id=381

8. Interdisciplinary Cooperation

It is promising that within the field of SSHs there are some positive examples of crossing the boundaries of disciplines. Although this subject did not fall under the METRIS study, it seems worth mentioning.

Firstly, already for the third year, with the ESF financial assistance, doctoral schools are operated in higher educational institutions (at first in the University of Latvia, later also elsewhere, for example, in Liepāja). These schools can be regarded as interdisciplinary – different disciplines combine their knowledge within the limits of a specific theme. For example, "Analysis of social, political and economic processes in the post-Soviet area," "Integration of the Baltic Sea region countries into key cooperation dimensions within the EU" etc. 8 from the 17 doctoral schools in the University of Latvia are thematically related to SSHs.

Secondly, there are scientific institutions, which were originally designed as interdisciplinary, for instance, the Institute of Social and Political Studies of the Faculty of Social Sciences of the University of Latvia (operating since 2004).

Thirdly, as A. Ādamsone-Fiskoviča (2011) points out, analysis of the "knowledge society," taking place in Latvia already for several years, is an instance of interdisciplinary analysis.

Founding of NRCs also is a promising occurrence. Owing to these centres, it will be possible to build solid infrastructure "muscles" in the next few years. Notably, both NRCs (of humanities and social sciences) are going to be housed in the same building. For the studies to be conducted at the NRCs, content areas have been defined without their compartmentalising into specific disciplines. The themes are novel and promising in the Latvian situation, such as visual perception, digital environment studies etc. These studies, though, may differ in terms of how deep the cooperation is developed: the disciplines may toil the thematic field either jointly and in an integrated manner, or just by working concurrently, or even by crossing the boundaries of scientific disciplines and involving practitioners in the creation of knowledge.

At the same time, to make a concession, for now there are no serious grounds for optimism regarding the mutual enrichment of all disciplines, because the future researchers are still to a large extent socialised in higher educational institutions that are established within the frameworks of specific disciplines, which are occasionally crossed only at highest levels of study. For all that, this crossing has begun at least within doctoral schools, and that is promising.

9. Conclusions and Proposals

In this analysis, the authors attempted to show that the situation with SSHs in Latvia cannot be deemed as either dramatically bad, or perfectly alright. Although there is insufficient activity of SSHs in representing the need to prioritise relevant long-term themes, good results can be achieved if they take on such mobilisation. SSHs definitely have less resources than natural

sciences and they not always avail of the existing opportunities; however, there are grounds to expect improvements in long-term development (support for international projects, NRCs, the expected setting of priorities for several sources of long-term funding).

Social sciences and humanities should focus on growing their "mass" as a field of science: obtaining influence in setting the research priorities and allocation of funding, participating in research on the European level, bringing into effect their public role, critically evaluating the societal processes and offering alternatives. In fact, the public role of SSHs is the most important item from this list, and all the rest is just a means for it.

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2.

Monodisciplinarity vs Interdisciplinarity: Conflicts, Dilemmas and Potentials

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Interdisciplinarity: Dilemmas within the Theory, Methodology and Practise

Abstract

Interest in the interdisciplinary approach has a long history and a lot of debates in the recent years. The article focuses on interdisciplinarity in both higher education and research. While academics tend to conclude that a deep understanding of contemporary society requires an interdisciplinary approach, the application of this approach in higher education and sciences, is still complex. The history and evolution of the interdisciplinarity concept through the times is described, discussing major challenges that have influenced today's higher education and research, and created the demand for interdisciplinary approach. Examples of interdisciplinary teaching across the Europe are given and the factors impeding interdisciplinary studies are examined. The role and significance of interdiciplinarity and its coexistence with the traditional – disciplinary- approach is presented, leading to the conclusion that despite contradictory opinions, interdisciplinary and disciplinary approaches do not compete; instead, they are rather complementary.

Keywords: interdisciplinarity, today's higher education, research.

1. Introduction

Interest in an interdisciplinary approach[1] emerged even, before the concept of "interdisciplinarity" explicated in the 1920s in the US. At that time, in Europe, this approach was promoted by the idea of 'unity of science', while in the US by an interest to foster research, '*which draws on more than one discipline' (*Klein, 2000, p.19-25).

Today, interdisciplinary studies are offered in a variety of European higher education institutions, and in internationally recognized universities world-wide. Interdisciplinary study programmes combine and integrate knowledge of different branches of social sciences and humanities as well as social and natural sciences, social and engineering sciences, etc.

In recent years growing interest in interdisciplinarity has been displayed also by global corporations, business incubators, various foundations and industrial research centres which recognized interdisciplinary approach as an opportunity to strengthen the ties and cooperation between research,

[1] Here and henceforth in the Introduction and Chapter I the concept "interdisciplinarity" is used in its widest sense, i.e., without distinguishing interdisciplinary, multidisciplinary or trans-disciplinary approaches.

education and business communities. It is also seen as an incentive to develop new, unique products. The interdisciplinary approach in research is widely used for the study of various complex issues that are topical for modern society.

However, in spite of success of practices, increasing popularity and growing interest, interdisciplinary approach is still confronted with the epistemological, institutional, organizational and other barriers both in higher education institutions and research centres. The main reason is different and sometimes conflicting views of its potential and importance in modern higher education and research.

The present-day complexity, volatility and diversity of the globalised world, presents changes and ever-new challenges to higher education and research. In this context, V. B. Mansilla (2004) concludes, that a deep understanding of contemporary life requires an interdisciplinary approach. There is a growing need for the involvement of experts of different disciplines to handle the complex issues in contemporary society and carry out interdisciplinary research related to various topical problems while the higher education needs a new approach that can give students generic knowledge, wide outlook, professional skills and competences.

At the same time, as educators and researchers agreed that the debates about disciplinarity and interdisciplinarity are complex as they "directly challenge nothing less than the way the understanding, production and dissemination of knowledge are structured within the academy" (Shailer, 2005). Also interdisciplinary approach raises questions about how and to what extent university researchers and educators collaborate with other parties involved in the new knowledge development (private research centres, industrial laboratories, business and commercial organizations, etc.).

2. Insight View into the History and Evolution of Interdisciplinarity

The wider research community's interest in interdisciplinarity grew in the early 1970s when the OECD published its Report "Interdisciplinarity – Problems of Teaching and Research in Universities"[2] and organized the first international conference devoted to interdisciplinarity.

With hindsight, we can say that the last forty years have been an important period for the history of evolution of interdisciplinarity. During that time a significant number of interdisciplinary education and research projects have been implemented, and the experience and the lessons learned have been extensively described in numerous studies and publications. This obtained knowledge has contributed to better understanding of the concept of interdisciplinarity and its different forms of application. Theoretical, educational and methodological aspects of interdisciplinarity have been treated in a number of monographs and numerous scientific articles. Although

[2] "Interdisciplinarity – Problems of Teaching and Research in Universities".

there are still different views on the concept of interdisciplinarity, a sound basis for further discussions and research has been created over these years.

As mentioned above, interdisciplinarity as it is generally understood today, was originated in mid- 1920s in the US. During that time the US Social Science Research Council in one of its programmes mentioned its desire to promote research which brings in more than one discipline"[3] (Klein, 2000, p.19-25). History shows that the US as well as British governments have played a crucial role in the development of interdisciplinarity. According to their initiative the first *problem-oriented*[4] interdisciplinary research projects were launched and these projects have given a strong impetus to the development of interdisciplinary research and, subsequently, in education.

To tackle unprecedented and complex challenges of the time, the US government during World War II decided to create research groups to conduct projects of multi-disciplinary nature. Scientists of the humanities, natural and social science were involved in those groups and among them – also experts in mathematics, physics, psychology, and economics as well as in other disciplines. These research projects resulted in a number of new theories, including game theory,[5] general system theory, and cybernetics.

The first interdisciplinary study programmes were also created in the US. This innovation in education of the late 1930s was initiated in the so-called 'area studies movement', which initially focused only on Asian regional issues. As for the post-war period, experts hold an opinion that the main driving force of the regional studies development was the limited capacity of the US to carry out their military and diplomatic functions during World War II in strategically important countries.

Thus, in response to the scarcity and lack of scientific expertise on countries in Asia and the Soviet Union, in the late 1950s, the US government awarded funding to the largest universities for the creation of new centres of social sciences and humanities.[6] Those centres had a specific task to focus their research on those regions. For similar reasons, the British government also in the early 1960s allocated funding for launching interdisciplinary, area studies centres, which oriented their research towards the Soviet Union, Asia and Africa. After the he UK's entry into the European Economic Community in early 1970s, the British universities started to offer master and later bachelor programmes in European Studies as an interdisciplinary programmes.

The establishment of regional studies programmes and centres in the US and UK was a novelty and a great challenge for the traditional (disciplinary) approach. Admittedly, the 1960s and 1970s in the history of interdisciplinarity were the years to be most associated with innovation and university reforms.

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[3] J. T. Klein – US researcher of history, theory and practice of interdisciplinarity, author of a number of monographs and scientific articles on the topic.

[4] Among the first research fields were defence and agriculture.

[5] Application of principles of mathematics and logic to political analysis when clarifying interests of actors and their rational thinking in conflict or cooperation. It seeks to answer the question: how will decisions be made given the actors' aims and information about them?

[6] This aim is integrated in US *National Defence Education Act*, 1958.

During that time interdisciplinary research and education were associated with student protests who criticized the academia for its abstraction and detachment from real-life problems (van Baalen, 2007; and Gozzer, 1982, p.281-289); and the dominating idea was that scientific discoveries must be practically applicable and serve the needs of society.

New interdisciplinary study and research programmes at universities in Europe and the US revealed a number of organizational problems. During that time many academics questioned the feasibility, applicability, and necessity of interdisciplinary approach and higher education and research.

However, the enthusiasm for interdisciplinary approach persists. In the decades to follow there was an ever growing interest in interdisciplinarity and numerous interdisciplinary educational and research projects where being implemented.

In the above mentioned the OECD report, interdisciplinarity is described as not an isolated phenomenon, but as a well-known approach existing in both Europe and the US.

Since 1945, a number of new multi- and interdisciplinary fields have evolved. Among them are political science, social psychology, criminology, biotechnology, molecular biology, information science, cultural studies and urban studies.

During the 1970s there was a great desire for "progress" and "growth" and interdisciplinary research was mostly perceived as a tool rather than a concept. Industrialized nations started to allocate increased financial resources for interdisciplinary research in areas of economic competitiveness, specifically, engineering and manufacturing, computer science, medicine and biotechnology (Klein, 2004). In the early 1990s interdisciplinary approach was associated most of all with the strategic research.

Looking back at the evolution of interdisciplinarity from the beginning of the 20st century to the present, one can say that interdisciplinary approach in the last century was fuelled by social sciences, expansion of the problem-oriented research, as well as the need for applied knowledge. At the same time, the consistent governmental support for interdisciplinary research and education has formed a widespread view within the scientific community that the concept of interdisciplinarity is mainly promoted by policy-makers, rather then by the interest of academic and scientific community.

3. Interdisciplinarity – Theoretical Framework

Despite the fact that interdisciplinarity is the main subject of many research projects it is still a vague concept. There is no single specific definition for interdisciplinarity; researchers indicate that it is difficult to find a common definition that would embrace the various manifestations of interdisciplinary approach.

Box 1. Multidisciplinarity versus interdisciplinarity

Multidisciplinarity

Multidisciplinary approach *is the lowest degree of integration.*

Multidisciplinary approach is not conceptually different from disciplinary approach. Multidisciplinary approach one can describe as collaboration between disciplinary approaches, without exceeding the disciplinary boarders, their theoretical or methodological frames and without changing them (Holm, Lianas, 2005). In the case of multidisciplinary approach each discipline considers the problem from its perspective (Seipel, 2005). This approach confronts the disciplines, applies their accumulated knowledge and methods, thus contributing to the study of the specific problem.

If multidisciplinary in education and research is classified as a form that complements a discipline and / or understanding, then interdisciplinary approach is based on the idea of 'integration of knowledge.'

Interdisciplinarity

Interdisciplinarity is *integration of knowledge, concepts or techniques of several disciplines* that helps to create *new knowledge* or *a deeper understanding* (Seipel, 2005). The knowledge, concepts, methods and approaches of several disciplines that are compared, combined and applied in such a manner resulted in deeper understanding of a problem. In this case the research result is greater than if knowledge of the separate disciplines is applied. Disciplinary approach is characterised by the search for an optimal solution, while interdisciplinary approach seeks alternative solutions.

Interestingly, interdisciplinarity has dual nature. It can be described as a process, i.e. interdisciplinarity is a way to solve, analyze or explore complex issues (e.g., socio-economic problems). This represents the so-called **instrumental interdisciplinarity**. One can say that in this case the interdisciplinary approach turns disciplines and subjects into instruments to explore a topic, problem or idea (Klein, 2006).

The other result is the reorganization of a discipline and creation of new knowledge, the so-called **cognitive interdisciplinarity** (Shove, Wouters, 2004)**.** 'A crossing of frontiers ' of academic disciplines and the creation of new disciplines are seen as the ultimate and at the same time the most controversial form of interdisciplinarity (Davidson, 2004). Despite a number of success examples, scientists indicate that the implementation of cognitive interdisciplinarity is a very difficult task.

The most frequently expressed descriptions of interdisciplinarity are the following: the use and combination of different knowledge and skills, the application of a number of methods in problem- solving, a problem-oriented approach and etc.; and two main dimensions can be identified: multidisciplinarity and interdisciplinarity.

The multidisciplinary approach fully recognizes the existence of autonomous disciplines; it draws on the knowledge of several disciplines and each of them provides a different perspective on a problem or issues. In multidisciplinary analysis, every discipline makes a contribution to the overall understanding of an issue, but in a primary additive fashion.

A classic multidisciplinary study programme is, for example, business and management studies (MBA). In the training, the multidisciplinary approach may also take a more simple form, for example, students specializing

in accounting, take a course in law or economics. One should take into consideration that the multidisciplinary approach enhances the student's knowledge and outlook, but it does not create an understanding of theories, methods, etc. of other disciplines (Klein, 2006).

Interdisciplinary approach involves combination and integration of theories and methodologies of various disciplines (Box 1). Its characteristic feature is the crossing and revision of borders of the disciplines. Harvard university faculty staff, for example, defines interdisciplinary understanding as "the capacity to integrate knowledge and modes of thinking in two or more disciplines to produce a cognitive advancement – e.g., explaining a phenomenon, solving a problem, creating a product, raising a new question – in ways that would have been unlikely through single disciplinary means" (Mansilla, 2005).

4. Interdisciplinarity: a Trend in Modern Systems of Higher Education and Research

Modern higher education institutions function in a post-industrial environment, which is characterized by rapid changes, abundance of information, technological development, growing competition, and uncertainty (Cameron, Tschirhart, 1992, p.87-108). Along with the changes in the global environment, in the last decades changes have also affected a system of higher education.

Observing the developments of the last twenty years, experts conclude that a new paradigm of the role and significance of higher education in society has gradually emerged. University, which has historically been a source of knowledge and culture, has now become one of the key elements of today's economy. As, already in the mid-1990s M. Castells and P. Hall suggested - 'universities for the knowledge economy are what the coal mines for the industrial economy' (Castells, Hall, 1994).

Along with the increased "value" of knowledge, the critical function of universities has been displaced in favour of the provision of qualified manpower and the development of knowledge. This is rooted in the belief that higher education and research is meant to serve the needs of society. Such a perception has been formed by various factors, where one of them is the growing demand for higher education.

Looking back at the last decades, it is evident that the number of people who choose to study and pursue higher education has increased in terms of both absolute numbers and as percentage of the population; researchers call this phenomenon "massification" of higher education.[7]

"Massification" of higher education is a tendency of a global nature observed in many countries. In this respects to strengthen the competitiveness of the EU and its Member States, the EU 2020 Strategy was launched with one of

[7] According to M. Trow's formulation on systems of higher education, higher education is considered as "mass" education when the age participation index exceeds 15% (Trow, 1996).

the goals - to increase the proportion of the population with higher education (in age group 30-34 years) to at least 40% by 2020.

This trend can be well observed also in Latvia's higher education. The data shows that in 2009 comparing to 2000, the proportion of people with higher education (the age group of 30-34) has increased for more than 50%. In 2000 it was 18.6% while in 2009 it reached already 30.1%.[8] Absolute figures show that in 1998 there were 70.200 students in Latvia's universities, while in 2008 their number had already reached 127.800. Furthermore, according to the national statistics, the largest increase in number of students was experienced by the study programmes in the social sciences and humanities. If the point of reference were the data of the early 1990s, the comparison with the figures of 2010 would reveal even more impressive increases.

With the growing demand for knowledge, market principles were introduces in the relations between universities and the public, changes took place also in the university-government contracts (resulting in smaller state grants), as well as the university's organizational structure and curriculum offers (Gibbons, 1998; and Becher, Trowler, 1999, pp.1-22).

Universities also began to face increasing public pressure to respond to the changing environment and to make the relevant adjustments in the study programmes accordingly. Gradually greater focus in study programmes was put on applied knowledge, development of students' skills, as well as the introduction of new study courses and teaching methods.

Quantitative and qualitative changes in study programmes were caused by the evolution of subject knowledge areas. According to B. Clark's (1996b) view, it has probably been a major driving force for the change in higher education and research in the 20th century. Over the past decades numerous new disciplines and sub-disciplines, theories and methodologies emerged which, among other things, expanded notions of subjects and teaching methods considered to be appropriate and applicable for university curricula.

The experience of recent years, illustrates for example, an increase in the involvement of experts and professionals from the 'non-academic' environment in the educational and training processes. Some experts believe that in future this approach could become a kind of good practice of how to transfer and disseminate applied knowledge to students.

Similarly, in the last decades educators have developed and implemented various new training courses and study programmes, including professional and interdisciplinary study programmes. In the 1970s and 1980s, in many universities, were introduced such study programmes as development studies, education studies, regional studies and etc.

Today, several decades later, it is agreed by experts that modern higher education is dominated by professional education; a strong emphasis on the 'professional' dimension of the higher education is also observed in the rhetoric of government and in national education policies. At the same time changes in the global environment and the increasing specialization

[8] Eurostat.

and fragmentation of knowledge has created a need and demand for new approaches to higher education and research. In this context social scientists focus on multiple levels of reality, where 'reality' is a nexus of interrelated phenomena that are not reducible to a single dimension (Klein, 2004; Caetano, Curado, Jacquinet, 2000, pp.528-533). Complexity is one of the features of modern society, which is characterized by ample diversity of processes, their interaction, interdependency and unpredictability.

Several recent studies concluded that in present-day society scientists are confronted with complex problems, which can be solved by collaboration of experts from various professions, integration of knowledge and disciplines (Ziman, 1997, p.71–82; and Robson, 1993). Frequently cited examples of the interdisciplinary areas of study are climate change and the environment, public health, welfare and demographic issues, globalization, regional and spatial planning, etc. According to experts', researchers' and policy makers' conclusions, the nature of contemporary social issues become increasingly interdisciplinary, which generates a growing demand for interdisciplinary studies and research (European Commission, 2006; EU Council, 2007). In this context, Harvard University Professor H. Gardner pointed out "whatever the power – even the necessity – of the disciplines, in the end, questions never stop at the boundary of a discipline. Efforts to develop decisive and personal ideas of the true, the beautiful, and the good necessarily take us beyond specific disciplines and invite syntheses" (Garder, 1999).

Some researchers in their studies tend to refer to the diminishing role of a 'profession' in modern society. Instead, they point out a new trend: an increasing demand for specialized knowledge, broad outlook and high-level skills. This trend is also reflected in the demand for higher education – in recent years universities are facing the growing demand for specialization and, at the same time, the need for a 'new' approach to provide graduates with broader knowledge and skills necessary for professional life. As it is commonly assumed, "individuals are no longer seen as specialists with narrowly defined responsibilities, but generalists with a particular area of expertise" (Breitenberg, 2006).

'Complexity' and 'volatility' of the global environment in many educators have created conviction that the professional activities in number of areas, but especially in social sciences require specific skills and abilities to look 'across disciplinary boundaries'.

Interdisciplinary approach in education, likewise in the research, entails an opportunity to examine an issue or a subject from the perspective of different disciplines and thus create a comprehensive and in-depth understanding of the subject addressed. As concluded in several studies, extensive development of skills is one of the major advantages of interdisciplinary education. Interdisciplinary approach fosters the development of critical thinking, analytical skills, ability to work with complex issues and multitude sources of information, teach collaboration and teamwork as well as creative approach to different life situations. In other words, interdisciplinarity encourages "multilogical thinking – the ability to think accurately and fair-mindedly within opposing point of view and contradictory frames of

reference. It is exactly these high level analytical skills that employers are often looking for rather than a discipline specific expertise (Dalrymple, Miller, 2006). A. Chettiparambil points that in 2006, the United Kingdom graduates independent of discipline were eligible for 40% of the jobs offered to university graduates (Chettiparambil, 2006). In this regard, another researcher M.Gibbons outlines that companies are searching for problem identifiers, problem solvers, and problem brokers. This applies also to the public institutions and policy-making sector, in particularly. Since, usually there are wide variations in the preferences and values of decision-makers, the interdisciplinary approach is a vital tool to integrate disciplinary knowledge in order to formulate and evaluate public policy options.

Interdisciplinary studies facilitate the development of skills and abilities by the large amount of information and its diversity, as well as by the cognitive conflicts that arise when working with alternative perspectives. Recently, scientists found out that disciplines have a direct impact on the way how an individual will assess different situations of professional life and beyond it, since individuals tend to associate themselves with the learned disciplines and view, assess and analyze situations and problems through the narrow prism of the particular discipline (Dalrymple, 2006, pp.29-30).

It is obvious that not all individuals will need interdisciplinary skills in their professional work. Dearing Report (1997) note that different students will want different depth and breath of knowledge, but goes on to recommend that "introducing breadth more extensively would assist students to respond to social, economic and cultural changes they will facing throughout (….) to think divergently and to integrate information and knowledge (…)." Although interdisciplinarity in higher education is seen as an innovative or modern approach, the idea of using interdisciplinary approach in the training process is not new. Already at the beginning of the 20th century R. Pound wrote, "The modern teacher of law should be a student of sociology, economics and politics as well. He should know not only what the courts decide and the [legal] principles by which they decide, but quite as much the circumstances and conditions, social and economic, to which these principles are to be applied. (...) It is, therefore, the duty of American teachers of law to (...) give to their teaching the colour which will fit new generations of lawyers" (Pound, 1907, pp.917-21; 925-926).

There has been a considerable growth of interest in interdisciplinary approach in higher education over the last 5-10 years. During this time many new study programmes of interdisciplinary nature have been created, some of which make an attempt at opening a new chapter in the field of education and knowledge. Some of the examples are:

- Master degree study programme in "Materials, economics and management, (*Oxford University*), the programme combines the knowledge of materials technologies, IT and management;
- Master degree study programme "Leaders for production" (*Massachusetts Institute of Technology*); the programme combines fields of economics, management and engineering);

- Master degree study programme in bioscience (*London School of Economics*) programme focuses on biomedical and biotechnology impact on the social science field.

A large proportion of professional programmes by their nature are multidisciplinary, for example, programmes of business and management, international relations, communications studies), or they are interdisciplinary (e.g., the environmental studies programme). A number of interdisciplinary study programmes arose due to the necessity to satisfy the needs of modern society, public institutions and international business corporations and to equip young professionals with both a wide-range and in-depth understanding of a certain area or topic. These types of studies are offered by the world's leading universities, such as Harvard, Stanford, Oxford University, London School of Economics and countless US and Canadian higher education institutions.

Promotion of the interdisciplinary approach and its implementation are emphasized in higher education policy documents of the EU Member States and various international organizations. It should be noted that much attention to interdisciplinarity and its inclusion in the EU and national policy-planning documents was given during the Bologna process. Already in the 2006, the European Commission called on the EU Member States to carry out restructuring and modernization of universities and implement the measures that would ensure a modern and high-quality higher education and research, including the following measures:

- to develop and implement appropriate study programmes that meet the needs of today's labour market;
- to promote and practise interdisciplinary and multidisciplinary higher education and research (European Commission, 2006; EU Council, 2007).

Another reason why it is now necessary to reconsider the role of interdisciplinarity in higher education and research is that interest in it is expressed not only by individual higher education and research institutions, but also by representatives of business and commercial sectors. The authors of, for example, the Danish Business Research Academy and the Danish Forum for Business Education study wrote, "Interdisciplinarity can become a new parameter of competition for Denmark, if we resolutely provide support for it. Through increased interdisciplinarity, we can get more out of the investments in knowledge and education that we are currently pursuing, among others as a part of globalization strategy. We can strengthen the interaction between research, education and business, so that firms can develop unique products which combine the most advanced knowledge within the humanities disciplines, social sciences, technology, health sciences and the natural sciences" (Danish Business Research Academy (DEA), Danish Forum for Business Education (FBE), 2008, p.5-6).

The experience of different higher education institutions and research centres shows that interdisciplinarity is a great challenge for - interdisciplinary projects developers as well as for the institutions. However, experience also proves that interdisciplinarity opens up opportunity to create new expertise,

knowledge and understanding of many complex and important issues for the modern society.

5. Practising Interdisciplinary Approach in European Education and Research

In 2005 the University of Gothenburg, in collaboration with other European universities, conducted a study (Holm, Liinason, 2005) to identify obstacles for interdisciplinarity in social sciences and humanities. By studying the practice of eight European countries[9] on the implementation of interdisciplinary approach, the authors conclude that an interdisciplinary approach is not foreign to any of these countries. Interdisciplinarity and crossing of boundaries between disciplines as an aim have been defined in education and research policy planning documents of several European countries. At the same time one has to admit that in the US, an interdisciplinary approach is applied more widely than in Europe, and that the practice and range of the implementation of interdisciplinary approach in European countries are significantly different.

Analysis of national policies of various European countries reveals that interdisciplinarity is applied more often at the master and doctoral level studies, as well as in research, while interdisciplinarity at the undergraduate level is severely limited. At the undergraduate level, the European countries consistently follow the disciplinary approach. The dominated opinion is that the education at the undergraduate level should focus on disciplinary study programmes, while interdisciplinary and multidisciplinary approaches are more suitable for graduate and doctoral studies (Table 1).

Many educators are convinced that because the interdisciplinary research and studies makes use of the acquired knowledge in particular disciplines it may involve only doctoral students or even specialists with a doctoral degree who possess an understanding of the relationship between the particular area of studies and other disciplines. However, this view is rejected by those educators, who think that interdisciplinary work may also be less ambitious and may not require good theoretical knowledge in a particular discipline.

This can be illustrated by the examples of Swedish and Finnish education systems, which offer to students, already at the undergraduate level, access to multidisciplinary and interdisciplinary study courses and programmes, as well as by examples of Norway and Britain where the reforms in education have resulted in the introduction of interdisciplinary study programmes at the undergraduate level. In many European higher education institutions interdisciplinarity, for example, is implemented by the so-called "modules", i.e., students can choose to study some of the courses of interdisciplinary nature. However, one can conclude that practice of interdisciplinarity at the undergraduate level is mainly a result of enthusiasm of individual academics, rather than the targeted policy of education.

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[9] Finland, France, Germany, Hungary, Norway, Spain, Sweden, the United Kingdom.

Table 1. Interdisciplinarity at different levels of education and research

	Undergraduate studies	Graduate studies	Doctoral studies	Research
Finland	yes	yes	yes	yes
France	no	yes	yes	yes
Germany	yes	yes	yes	yes
Hungary	no	yes	yes	yes
Norway	yes	yes	yes	yes
Spain	no	no	yes	yes
Sweden	yes	yes	yes	yes
United Kingdom	In individual programmes	yes	yes	yes

According to Holm, M.U. and Liinason, M. (2005), a serious barrier to the implementation of interdisciplinary study programmes at the graduate and doctoral levels is a strong emphasis on specialisation in undergraduate studies and lack of interdisciplinary courses and study programmes at the first level. Greater opportunities for interdisciplinary studies are at the graduate level, which consequently creates a good basis for further high-quality interdisciplinary doctoral studies or involvement in interdisciplinary projects. However, if the theme of the doctoral thesis or research project must comply with one of the academic disciplines, it becomes a serious obstacle for interdisciplinary research projects in doctoral studies as well. The dominant at higher educational institutions disciplinary approach, and the existing rigid general structure of higher education are fundamental obstacles to practice an interdisciplinary research and implement interdisciplinary study programmes and courses. Many educators argue that the coexistence of disciplinary and interdisciplinary approaches in the higher education institution is a challenging practice. It becomes particularly problematic when the interdisciplinarity is carried out more widely than in a scope of separate projects.

The main institutional barrier to the implementation of interdisciplinary approach already was formulated in the OECD report, "Communities have problems, universities have departments" (OECD, 1982).

Caution concerning new teaching methods and study programmes is understandable since the increase in the number of disciplines from one hand can also increase potential 'market attractiveness' of the university, but, on the other hand, it contains certain risks –increased costs, changes in the structures of power, influence and resource allocation.

Another barrier, which is usually referred to, is a lack of a common definition of interdisciplinarity. Definition of interdisciplinarity is not founded in any European policy-planning document; therefore it is not surprising, that some forms of interdisciplinarity are supported by the universities while others – ignored. Non- existence of such a definition creates the situation where

interdisciplinarity can be interpreted according to individual understanding and needs.

In Germany, for example, public funding supports mostly problem-oriented research. In Finland and Sweden – interdisciplinarity research is implemented in higher education institutions in collaboration with the social partners (trade unions and industry representatives). In European universities in general, interdisciplinarity in undergraduate education is often viewed as a way for the higher education institutions to adjust their training programmes to the current demands of the labour market. The public debates surrounding interdisciplinarity in higher education often refer to the creation of new vocational degrees (Holm, Liinason, 2005).

The interdisciplinary approach in research organizations is more common and widespread practice than in European higher education institutions. However, the leaders in this area are private and state-supported research institutions and not research centres at the European universities. Currently, a considerable amount of research and new knowledge are generated outside the universities. One of the explanations of such situation is that since World War II, universities have sought to establish themselves as the prime institutions for carrying out fundamental research, while applied research was left to state or industrial laboratories.

However, there are other, not less decisive factors. Research centres outside the universities are more flexible and can easier adapt to new and complex requirements, their activity is 'problem-oriented' and they do not have rigid administrative structures. Crucial factor is also the opportunity to attract the necessary financial and human resources. As it is known, interdisciplinary research is more expensive, time-consuming and also contains certain risks. Therefore, according to the experts, additional encouragements for the research institutes and groups are necessary to raise their initiative to conduct interdisciplinary research.

Regarding the expertise required for interdisciplinary work, it is believed that experts and professionals in the field have a better understanding of currently topical issues than the isolated or too narrowly specialized researchers. Therefore an increasing role in identifying interdisciplinary problems and the implementation of such research projects belongs to the professionals and experts who work outside the academia.

Many educators, scientists and practitioners have turned to interdisciplinary work to in order to accomplish a range of objectives (Klein, 1990):

- to find answers to complex issues;
- to analyze and understand the broad issues;
- to develop links between theory and practice (cooperation of scientists – experts, research institutions – private sector, research institutions – government etc.);
- to solve problems that are beyond the scope of any one discipline;
- to achieve unity of knowledge, whether on a limited or grand scale.

The evaluation of the Gothenburg study (Holm, Liinason, 2005) concludes that there are apparent inconsistencies between the support for interdisciplinary

education and research as expressed in the nation documents of European countries and the actual measures undertaken to encourage the implementation of interdisciplinary approach in education and research.

Ministerial policies in all countries are more or less positively disposed to interdisciplinarity and breaking of disciplinary barriers. However, this is seldom followed by changes in the systems of higher education. This positive ministerial attitude is therefore viewed as 'lip service' and empty rhetoric. In many national contexts funding procedures and assessment exercises are still carried out according to disciplines – a fact that creates major difficulties for the establishment of interdisciplinarity (Holm, Liinason, 2005).

6. Disciplinarity vs Interdisciplinarity: Conflicts, Dilemmas and Opportunities

Over the past hundred years, a certain order has been established in higher education and research– it has relied to *academic disciplines* and *clearly defined boundaries of knowledge* to generate new knowledge and provide a process by which it becomes accepted. At the level of study programmes and research projects it means to work within the boundaries of the discipline, respecting of these boundaries, and specialization, which is the cornerstone of disciplinary approach. Specialization has promoted the development of disciplines, refined the theories, methods, technologies, and contributed to discovery of new knowledge (Klein, 1990, p.19-25; and Seipel, 2005, p.2-4).

At the centre of interdisciplinary studies is not a discipline but a topic or area that shall be explored by using and integrating knowledge, concepts and methods of several academic disciplines. Thus, it is evident that in the debates on interdisciplinary higher education and research crosses two different frames of reference. For some experts, the interdisciplinary approach opens a pathway to 'work across the disciplinary boundaries,' to examine complex issues and synthesize a new knowledge. While the other ones, holds the view that familiarity with the main principles, concepts, theories and debates of a discipline is the best way to produce graduates with the knowledge and to care for the quality of research.

One of the consequences of the gap between different views of interdisciplinarity – and the assumed consequences for the students – can be illustrated by two conflicting views of interdisciplinarity within education. The supporters of interdisciplinary education suggest that it develops students' critical consciousness and flexibility in applying different methodologies of knowledge; the others, however, are concerned that interdisciplinarity, especially at the undergraduate level, can give to student superficial competence or ever worse – dilettantism. Part of the educators believe that interdisciplinarity is primarily a concept, while others argue that the best interdisciplinary work lies outside the university – in government, industry and research centres, but not in the university academic departments and research institutes. The latter view usually expressed by conservative (disciplinary)- minded educators and policy-makers, who treat interdisciplinarity as a tool only for the so-called "problem-oriented" research.

It is thus understood that interdisciplinarity:

- focuses on using knowledge for research of practical issues (as opposed to the scientific approach which directs its resources to theoretical explorations);
- is less interested in new scientific discoveries;
- moreover, its starting point is the area (and not the discipline or its element, as is used to be in a scientific work).

The view that interdisciplinarity is mainly a method for studying complex issues is quite popular (the so-called "instrumental interdisciplinarity", see more in Chapter 3). It acknowledges the potential of interdisciplinary approach to tackle topical issues; however it does not recognize it as a 'scientific' approach. Educators admit that the strong emphasis on instrumental interdisciplinarity is one of the key factors that make it difficult to introduce "interdisciplinarity" in higher education as a critical and scientifically proved method with high demands regarding the theoretical and methodological knowledge.

Ever since the 1970s the coexistence of disciplinary and interdisciplinary approaches in higher education institution has been a sensitive issue. Many experts, educators and researchers hold the view that interdisciplinarity may threaten the role and significance of the disciplinary approach in higher education and research. However, those who practice the interdisciplinary approach note that this view is misleading. Interdisciplinary and disciplinary approaches do not compete; instead, they are rather complementary.

Academic practice proves that disciplinary academic structures are a precondition for the creation of new interdisciplinary studies (the so-called disciplinary paradox[10]) and a high-quality interdisciplinary research is also not possible without excellent disciplinary knowledge. In interdisciplinary studies each student should be given the depth, the expertise, and specific knowledge and, for this to happen, the study programme must first provide good disciplinary knowledge, and only then interdisciplinary practice. Educators reveal – stinger the knowledge of the disciplines, the better the interdisciplinary experience and results.

The dialectic or interactions of these two approaches, as well as the interrelation and further development have been frequently stressed in various studies. Experts argue that interdisciplinary research is important not only to overcome the limits of disciplinary divisions but also enhance the disciplinary development. At its best and most creative, interdisciplinary produces insights that were previously not perceived by individual disciplines working alone. (Shove, Wouters, 2004)

Another reason for critics towards the interdisciplinarity is its excessive focus on the needs of labour market and insufficient attention to academic knowledge. At the same time researchers predict that with the increasing socio-economic complexity, many individuals in their professional activities

[10] Disciplinary paradox suggests that interdisciplinary activities /interdisciplinarity/ is more prominent in the areas where disciplinary structures prevail.

will need a higher-level skills and an ability to adapt to a changing environment. This particularly refers to professionals who will be employed in the field of innovation and deal with new and unpredictable phenomena, or those making judgement with respect to complex relationships or large amount of varied information (Hodgson, 2001).

The dilemma of higher education was well characterized already by M. Gibbons. He stated that education in advanced industrial societies has "the paradoxical task of preparing people to perform difficult jobs, while bringing them to accept that they will have to change their jobs and skills quickly and often" (Gibbons, 1998).

Different understanding and conflicting views on the credibility of the interdisciplinarity, its application and the expected results, are also serious obstacles to the implementation of interdisciplinary approach. Lack of common understanding limits opportunities for educators and researchers to carry out projects of interdisciplinary nature, to explore the potential of interdisciplinary approach and to develop good practices.

During the last decade there have been numerous events dedicated to interdisciplinarity where scientists, researchers, educators, policy makers and representatives of international organizations, have exchanged experiences and insights of different issues related to interdisciplinarity. At the same time this debates seems to have been fragmentary. J.T. Klein stressed in his above- mentioned studies that only a relatively narrow circle of educators is interested in and uses an interdisciplinary approach, which is still a dominated trend in higher education.

A frequently pointed-out obstacle to the interdisciplinary approach is the lack of a unified theoretical framework, different practices and experience associated with this approach. Since the 1970s there have been many publications and studies about interdisciplinarity, however reliable sources on the interdisciplinary education and research appeared quite recently. Educators admit that an interdisciplinary curriculum design and its implementation is a difficult task, since as a rule, the implementation process is even more complex then the curriculum design.

Academic practice shows that design of interdisciplinary study programmes or courses calls to revise the former practice and introduce changes throughout whole study process – from design of courses and study programmes, their organization and teaching, work with students and evaluation of knowledge, to financial and organizational issues (e.g., planning the load of the teaching staff). It is also necessary to evaluate and reorganize the content of various disciplines, including an assessment of the acquired knowledge in individual studies area, identification of strengths and weaknesses, as well as an evaluation of the importance of a given discipline in the context of a specific topic or question. According to educators and researchers, interdisciplinary work often requires integration of different methods and modes of thinking. This can be considered as an advantage and also as the greatest challenge of interdisciplinary work.

Although today there is still no common theoretical basis and principles on which interdisciplinary study programmes should be constructed, in recent

years a sufficiently large amount of literature[11] has become available and can provide a clear understanding of the theoretical, methodological, etc. aspects of such studies. Guidelines for the development of interdisciplinary studies are given also in J.T. Klein's studies "and the website of the Association for Integrative Study (http://www.units.muohio.edu/aisorg).

In the recent years a various parties involved in higher education and research have devoted their critics also to the disciplinary approach. Basically, concerns relates to education that is 'detached' from real life, since in disciplinary studies problems and issues are addressed from the perspective of one discipline or sub-discipline. Also, the disciplinary approach is frequently criticized for insufficient attention to the development of skills, competences and strengthening of 'inflexible' thinking and too close focus on knowledge. In research, in turn, increasing specialization is not able any more to provide understanding of many issues that are topical for modern society.

In 1980 the American philosopher C.O. Schrag analyzed the sources of the crisis in modern research, which hinders comprehensive development. It is indicated in his studies that one of the sources is the increased specialization and differentiation of knowledge, without orientation towards the totality of knowledge and connection to the totality of an individual's experience (Schrag, 1980, pp.1-29).

Different and mutually conflicting views on both the disciplinary and interdisciplinary education and research show that the discussion of interdisciplinarity is not just a debate on a 'different' or 'new' approach to higher education and research; it is part of a wider debate on what constitutes competitive and high quality education and what is the role of higher education and research in modern society?

Describing the challenges what the higher education institutions will face in the future, M. Gibbons (1998) argued that not only will higher education in the 21st century have to become relevant, but also that relevance will be judged primarily in terms of outputs, the contribution that higher education makes to the national economic performance and through that, to the enhancement of the quality of life. The capacity of universities to implement this task is intended to have a direct impact on the behaviour and the functioning of

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[11] Two essays by Newell, W. H.: a) "*Designing Interdisciplinary Courses"* (1994) gives an insight into the design of interdisciplinary courses, discusses the theoretical framework and identifies the expected results; b) "*Powerful Pedagogies"* (2001b) treats on new assessment methodologies and pedagogical results by using integrative learning; ed. Seabury, M.B. (ed.) (1999) essays "*Interdisciplinary General Education: Questioning Outside the Lines*", give ideas of creating the comprehensive education curriculum with a view of developing students' skills; Davis, J.R. (1995) *"Interdisciplinary Courses and Team Teaching: New Arrangements for Learning"* describes the experience in designing five interdisciplinary courses for the University of Denver; Haynes, C. (ed.) (2002) essays "*Innovations in Interdisciplinary Teaching"* provide an idea of interdisciplinary studies and study programme designing; Klein, J.T. (1999) *"Mapping Interdisciplinary Studies"* also works by Field (1994), Farmer un Napieralski (1997), Schilling (2001), McGann (2001), Tommerup (2001), Field, Stowe (2002), Wolfe, Haynes (2003) and the Harvard University "Project Zero" reports provide extensive information students' evaluation in interdisciplinary study programmes; Repko, A. F. (2005) *"Interdisciplinary Practice: A Student Guide to Research and Writing"* offers methods of interdisciplinary research.

higher education institutions. Such pragmatic view most likely will trigger critics and arguments to disprove this approach; however, M. Gibbons deems that no other rationale or justification for higher education institutions will carry equivalent weight: "If the universities do not adapt, they will be by-passed."

At the same time, it is clear that the universities still continue to have a substantial influence and choice to decide on their range of studies, their content and methodological framework.

To accommodate the new paradigm, clearly some adaptation is going to be necessary. However, because national economic development is a complex and multifaceted phenomenon,[12] the range of adaptations may be expected to vary widely across countries and over time (Gibbons, 1998).

The practice of higher education institutions and research centres of European countries, as well as of the US and Canada, clearly shows that modern higher education can accommodate interdisciplinary study programmes, even if they encompass the changes of the usual practice and in the institutional and organizational procedures. In the above example of the Danish Business Research Academy and Danish Business Education Forum it was stated by the authors: "If we do not concentrate on thinking across disciplinary boundaries, we risk losing new knowledge and skilled workforce. Thus, interdisciplinarity in research and education is not a goal in itself but an instrument for creating new knowledge and competences" (2008, p.5-6).

Recognizing the potential importance of interdisciplinary approach in modern higher education and research, the following question arises: is the comparison or complete separation of the disciplinary and interdisciplinary approaches the most beneficial and effective way to contribute to the quality of modern education and research?

7. Summary

In spite of the several decades-long debate and support by policy- makers, educators and researchers, the interdisciplinarity has not yet become a recognized and widely used practice in European higher education, and its potential in research institutions has not been fully exploited. Many educators still treat the interdisciplinary approach in higher education and research with caution.

The view that higher education and research must serve the needs of society causes scepticism among many educators and researchers. They believe that the focus of higher education on professional study programmes is a kind of short-term solution and an excessive concession to the current demands of the labour market. However, most of the experts agreed that the changes that are taking place are not notional (Gibbons, 1998; Becher, Trowler, 1999, p.1-22). In this context, in the early 1980s the French philosopher J.F. Lyotard

[12] ...dependent among other things upon history (e.g., previous economic performance) as well as current socio-political factors (e.g., demography, infrastructure, etc.).

wrote: knowledge is and will be created to be sold, the research results are and will be purchased to convert them into new products; in both cases the aim is a barter transaction (Lyotard, 1984).

Interaction of higher education with the changing global environment and orientation towards the needs of modern society, business community and labour market should not be seen as a threat to the higher education. Rather, it should be viewed as an opportunity to diversify study programmes and create a comprehensive understanding of the current developments in modern society.

Perhaps one of the critical factors why a still relatively small number of educators display an interest in the interdisciplinary approach is the lack of information and knowledge. Another element, as mentioned earlier, is the different and frequently conflicting opinions on the application and integration of interdisciplinary approach in higher education and research. This seriously impedes the practice of interdisciplinarity and consequently restricts the development of the potential of the higher education and research, using the interdisciplinary approach.

To remove barriers to interdisciplinary study programmes and research projects, it is necessary:

1) to develop a deeper understanding of the theoretical framework for interdisciplinary educational, training methods and expected results as well as its potential for application; this could reduce the gap between the conflicting views and create a more uniform opinion on the importance, potential and use of the interdisciplinary approach in modern higher education and research;
2) to share experience and best practices in/on the implementation of interdisciplinary study programmes and research projects;
3) to reduce the hindering factors, by providing greater flexibility and access to administrative, financial and human resources necessary for the implementation of interdisciplinarity in higher education and research institutions;
4) to gain political support and that of policy-makers in order to agree on measures for the enhancement of interdisciplinary approach in national higher education institutions and research centres.

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Interdisciplinary Research Today – its Preconditions and Opportunities for Facilitation

"Discussion of interdisciplinarity can be viewed also as a discussion of innovation in science research"[1]

Abstract

Interdisciplinary research is one of the central elements in the discussion about modern science and research. In this paper the concept of interdisciplinary research and related issues are discussed. The aim of the paper is to outline contemporary discussions on interdisciplinary research both from the perspective of its very definition and general understanding. These issues are further illustrated from a political science perspective. It is concluded that the debate on interdisciplinary research mainly concerns the division of the scientific work into disciplines which are undefined when interdisciplinary research is performed.

Keywords: interdisciplinary research, modern science.

1. Introduction

Modern society is faced with increasingly complex problems – both local and global. To effectively tackle these problems, science and research are seen as essential vehicles to meet peoples' expectations, with a particular emphasis on the potential of interdisciplinary research. Science is now affected by context, or the broader environment in which it operates – it can be used for policy development, technological development and economic growth. The interdisciplinary approach is increasingly highlighted as a crucial need in scientific research, and it shows not only in the general guidelines, but also in decisions on research funding. Despite the popularity of the concept and frequent references to it, it is the object of many debates and issues ranging from conceptual problems. These problems are, namely, regarding the differences between the concepts of "multidisciplinarity", "interdisciplinarity" and "transdiciplinarity" and more fundamental discussions on categorization of science disciplines and their functions,

[1] Weingart, P., Stehr, N. (2000), *Practising interdisciplinarity,* Toronto: University of Toronto Press, p.30.

and the place of interdisciplinarity concept in this context. Although the discussion of interdisciplinary research and its implementation is not a new phenomenon, its nature is still quite experimental.

This article aims to sketch in the most important contemporary debate, which is related to interdisciplinary research, in the context of its definition as well as general understanding, and to illustrate these issues from the perspective of political science. This article looks at different views of what encourages interdisciplinary research and debate about whether and how interdisciplinary research should be encouraged. **Problems of defining interdisciplinary research** will be highlighted, searching for the answer to the question of how interdisciplinarity may be defined. Differences in the currently used definitions and the consequences of a lack of agreement concerning the interpretation of this current term will be brought out. This is followed by **an analysis of preconditions for interdisciplinary research**, which is an important question because the answer to it explains both the ever-increasing emphasis on interdisciplinary research and serves as an indicator when considering ways of fostering interdisciplinary activities which, in view of their specific nature, is not a simple issue. As it often happens with popular concepts and initiatives, they are loud and clear at the declarative level, but when it comes to their practical implementation or, more importantly, facilitation, the best and optimal way of tackling them is unclear. Therefore, the article will address **opportunities and constraints of facilitation of interdisciplinary research** both from the perspective of research institutions and the perspective of the existing state policy. Interdisciplinary research has been discussed widely, but, despite the fact that better organization and promotion of science, technology and innovation as one of the public policy challenges should find expression through a popular and growing research activity, empirical studies of the specific research organization in interdisciplinary format, its organizational design and promotion are rare, and it is a field that requires extensive further research.

In Latvia, like in the rest of the world, the need for an interdisciplinary approach is frequently interpreted as to be applied both in education and research, however, as shown by the analysis of the preconditions for the implementation of interdisciplinary research, it is an individually complex and expensive activity. It is precisely for this reason that the assessment of the development of this trend in the world and European research is particularly topical to select the best ways of strengthening interdisciplinary research.

2. Concept of Interdisciplinary Research

A number of discussions have been connected with the definitions of interdisciplinary research, which will be touched upon here. For various reasons, the concept of interdisciplinary research is characterized by uncertainty about its meaning and, as with other complex concepts, there is no single accepted definition, although attempts to define the interdisciplinary work date back to the 1930s (Lattuca, 2010, p.10).

Difficulties arise from different experiences with the activity, from the various systems of research organization, from differences in understanding the development of science and disciplines, as well as other conditions. Before explaining the essence of the concept of interdisciplinary research in greater detail, it is important to identify the related concepts. Among these concepts there is multidisciplinary research, transdisciplinary research, team science, integrative research, and others. However, the initial perspective of considering interdisciplinarity can be provided by examining the individual components of this concept (inter- and discipline), especially the part that represents the discipline. Before interdisciplinary research as a concept gained popularity, research work was organized within the particular disciplines. To a large extent this situation continues in existence. This seemingly defining fact has also practical consequences, namely in research administration, funding, new research problem definition and other issues are addressed within the discipline. By emphasizing the formulation of research questions interdisciplinary research is defined as a sum of identified problems in different disciplines (Salter, Hearn, 1996, p.174) since interdisciplinary research is involved to be study such problems which cannot be covered within a single discipline. In addition, an individual discipline is often characterized by a focus on its topics, without thinking about the problem issues, while the root of interdisciplinary research is the very problem to be solved, not just a theme to be traditionally researched.

This juxtaposition of disciplinary and interdisciplinary has not always been depicted in a positive light of interdisciplinary research as a complementary form because traditional disciplines and their researchers are often perceived as more serious, more consequential and more central to scientific activity (Salter, Hearn, 1996, pp.178–179). The conclusion resulting from the purposes of the definition is true also in modern discipline-dominated academic reality, and the place of interdisciplinarity is less significant. Often enough the academic bodies (Salter, Hearn, 1996, pp.173), such as faculty and department divisions, as well as traditions are the ones that maintain disciplinarity. Thus it leads to the conclusion that the promotion of interdisciplinary research depends on organizational measures that break down the walls of disciplines. Admittedly, the academic structures that are open to collaboration may retain strict disciplinary divisions and consequent research activities, if researchers have no willingness or desire to cooperate in order to tackle problems of a wider scope. Viewed from another perspective, the juxtaposition of interdisciplinarity and individual disciplines can be considered contrasting, that is, disciplines are conservative, closed to innovation, they impede progress, while interdisciplinary research is characterized by the opposite – in its very essence it is innovative, creative, and it cannot be closed or inflexible. Table 1 shows the nature of disciplinary and interdisciplinary activities, as well as the divide between disciplinary and interdisciplinary activities. This is complemented by the view that interdisciplinary research as a specific activity lacks its own identity and traditions (Klein, 1990, pp.12–13).

Table 1. Characteristics of disciplinary and interdisciplinary activities

Disciplinary	**Interdisciplinary**
Organized by departments	Organized outside departments
Mainstream	Non-mainstream
Specialized	Diversified
Findings	Integration, applications
Laser	Projector
Fundamental	Applied
Hierarchical	Democratic, cooperation-oriented
Formal	Informal
Established	New
Majority	Minority

Source: Borrowed and complemented from Pfirman, S., Martin, P. (2010, p.388)

The described distinction between interdisciplinarity and single-discipline to highlight the features of interdisciplinarity can be related to one of the two directions into which any discussion on interdisciplinarity can be divided, namely, the conceptual direction (Salter, Hearn, 1996, p.29). It views the term in a more conceptual perspective in the context of development of science and research organization, which is an essential perspective since it allows placing present-day discussions on interdisciplinary research in a broader historical context and the context of modern trends.

There is also another complementary perspective on interdisciplinary research, known as the instrumental perspective (Salter, Hearn, 1996, p.29), which is dominant in the discussion of what is interdisciplinary research. This perspective deals with what the practical sense of interdisciplinary research is – what encourages or makes it necessary to pull down the boundaries of structured disciplines, to address costly and unpredictable interdisciplinary research projects that are difficult to manage. The instrumental perspective associates interdisciplinarity with the challenges and problems that it must address, with the current needs of various interested parties and society, something that can be achieved through a new kind of research organization.

Apart from considering the very concept of interdisciplinarity, its nature can be better understood by having an insight in related and seemingly similar concepts. The key differentiating feature of multidisciplinary research is that within its framework researchers from different disciplines come together for tackling any given problem, however, it does not imply long-term cooperation and deeper integration between the disciplines (Committee on Facilitating Interdisciplinary Research, 2005, p.29). Each of the parties involved in this joint research continues to work in their discipline; moreover, they have not been inspired or influenced by the joint project, they cooperate sequentially and separately, and remain separate after the cooperation. In multidisciplinary research representatives of different disciplines exchange

methods, may work in one physical or virtual space on the same problem, but each party deals with the specific aspect of an individual problem separately (Committee on Facilitating Interdisciplinary Research, 2005, p.27). Consequently, multidisciplinary research does not result in deeper integration, no new cross-disciplinary are created, as well it can help to address less complex research problems than interdisciplinary research. Comparative politics, which is one of political science research areas, it is multidisciplinary research that is dominant in the event of cooperation with other disciplines. Researchers working in interdisciplinary political science related areas, such as women's studies, post-colonial studies or other areas are associated with one specific basic discipline to ensure their academic recognition and career development (Ross, 2009, pp.27–29).

In contrast, transdisciplinary research comprises such activities, typically involving both academic disciplines and interdisciplinary research, as well as other potential parties, such as wide involvement of business sector (Hadorn, Biber-Klemm, Grossenbacher-Mansuy, Hoffmann-Riem, Joye, Pohl, Wiessmann, Zemp, 2008, p.29).

In a way, it can be argued that the concept of interdisciplinarity is applied to characterize an average level of potential interaction/integration of various research disciplines, while multidisciplinary research entails a lower level of interaction and its consequences. Transdisciplinary research implies the highest level of involvement of various parties. Despite the above distinction between these concepts, their definitions and applications are quite different and not clearly identified.

Has the concept of interdisciplinary research been recognized and defined in Latvia? If yes, then how? The term is often used to describe collaboration of disciplines, and it is often invoked to indicate that research is given modern, innovative consideration, aiming to attract funding or reap any other benefit that may arise from the reference to the term. References to interdisciplinary research without an attempt at defining can be found in the strategic documents of the leading universities of Latvia – the University of Latvia (LU) and Riga Technical University (RTU) (Riga Technical University, 2006/2007). The strategic guidelines of the University of Latvia (University of Latvia, 2008) make use of intersectoral and cross-sectoral research concepts, highlighted as vital to ensure the status of University of Excellence, but their essence has not been described. The strategy of the Riga Stradiņš (*Rīga Stradiņa*) University (RSU) states that one of its strengths is interdisciplinarity in research work (Rīga Stradiņš University, 2008).

While studying Latvia's priority research areas for 2010–2013 one can conclude that features of interdisciplinarity and problem orientation appear at least thematically, for example, biomedical technology research is an interdisciplinary research direction, while climate change, human security, public health, food research are research areas that arise from current problems. However, the Scientific Activities Law, which defines the various field-related concepts, makes no mention of the concept of interdisciplinarity. The researchers themselves almost never refer to interdisciplinarity, despite the fact that several projects demonstrate its characteristics. One of the most

recent and large-scope research activities in support of research in Latvia is the activity "Support for science and research", financed by the European Regional Development Fund. Looking at the publicly available information on this activity and the approved 115 projects (State Education Development Agency, 2011), we can deduce that features of interdisciplinary research in Latvia can be identified.

It can be concluded that the interdisciplinary research concept is vague and ambiguous, not only in the international discussions, but also in Latvia. Therefore, the scientific policy makers in Latvia and other key players should consider the need to initiate and create a common understanding of this concept for practical aims and broader scientific discussion purposes. Also at the EU level it would be worth considering a common understanding of interdisciplinary research, especially because the new EU strategy for 2020 and one of it's pillars the "Innovation Union" place huge emphasis on Europe's grand challenges. These challenges are problem-oriented and will require ever greater involvement of interdisciplinary research to respond to them.

3. What Initiates Interdisciplinary Research and What are its Prerequisites?

Why do researchers who work within their disciplines and feel comfortable still engage in complex and vague interdisciplinary research projects in which they need to collaborate with colleagues of other disciplines who using other methods, terminology, and often have different world perception? The answer to this question is multifaceted, and can be compared with the answers to such questions as, for example, why Columbus went looking for new territories? Why are people looking for a way to other planets, etc.? It seems that if we look at the profession as that of a scientist, the answer to the question of the factors contributing to interdisciplinary research is evident because people who are engaged in science are by their very nature motivated to think further than the achievements in hand and search for ever new patterns and ways of improving people's lives. Many debates on practical problems cannot be resolved within an individual discipline because they are on disciplinary boundaries. Besides, since both nature and society are characterized by complexity (Committee on Facilitating Interdisciplinary Research, 2005, pp.30-39), a multidisciplinary collaboration seems only logical. Indeed, a scientist, as described in these lines, is a man or woman, who is involved in interdisciplinarity 'venture' and is not restricted by or afraid of it's effect on his or her salary, prestige, academic position or other conditions. So it can be argued that the two central interdisciplinarity drivers are, first, the unresolved issues and, secondly, the incapacity of the prevailing science structure by discipline to offer the tools to provide answers to these questions, which necessitates crossing the disciplinary boundaries. Ideologically, interdisciplinary research is not a new phenomenon and is often associated with the antiquity when, because of the two above mentioned central reasons, knowledge in different branches was amalgamated.

Today, these traditional motivators have been complemented with another important factor, known as the global problems or grand challenges, which present socially topical problems and high expectations, are placed on science research to find the solutions. The challenges of contemporary proactive policies require that political science works more together with other disciplines to analyze proactive policies and develop solutions (Greaves, Grant, 2010, p.320). Even when studying electoral behaviour and public opinion, researchers are interested in the psychological basis of behaviour, which creates an initiative to use the insights offered by psychology (Druckman, Kuklinski, Sigelman, 2009, p.488).

Among researchers of political science there is both optimism for cooperation with other disciplines, and scepticism, and a view that interdisciplinarity is only a popular name to invoke in order to receive funding (Greaves, Grant, 2010, p.320). Political science research by its very nature is related to other disciplines arising from history and philosophy, but also using the settings from economics, sociology, and jurisprudence, psychology, geography (Greaves, Grant, 2010, p.320), cognitive science and anthropology (Druckman, Kuklinski, Sigelman, 2009, p.485). This connection with other disciplines may be regarded as strength of interdisciplinary research. Some arguments in favour of the cooperation of political science with natural rather than social sciences. Social sciences can be difficult to agree on the methodologies, while representatives of natural sciences will have a greater desire to learn new things (Greaves, Grant, 2010, p.334). One of the most important and extensive research questions in political science is the development and activities of the European Union and the problems associated with them. Research funding institutions demand interdisciplinary research in this field in collaboration with historians and legal researchers since the application of this approach provides more comprehensive and qualitative research. Political science studies of the EU can, and actually do, utilize information from historical case studies and analysis of the historical development of the EU (Kaiser, 2008, pp.300–309).

There has been no extensive research on interdisciplinary research and its characteristic features, but the available research results also mention, apart from the above central motivators, the incentive of eventual intellectual enrichment in the process of interdisciplinary research (Rhotenm, 2004, p.9). For example, for a political science researcher to successfully engage in interdisciplinary study it is necessary to learn theories, concepts and methods of other disciplines (Druckman, Kuklinski, Sigelman, 2009, p.504). Truly interdisciplinary research projects present not only the chance of intellectual enrichment, but even require it because in order to work on one problem together with researchers from other disciplines. Moreover, one must understand the methods and skills to be used by researchers in other disciplines, as well as be able to draw conclusions about the compatibility of approaches of different disciplines. This factor can be viewed both as a motivator to engage in interdisciplinary research, and as an obstacle because it requires extra effort and time that should be given to the research. This discussion is not an issue in the cases when interdisciplinary research is not

carried out as a team effort, but rather by borrowing methods and settings of other disciplines. In political science, for various reasons, this latter practice is more common than teamwork. For example, in the above mentioned studies of electoral behaviour and public opinion, where political science researchers resorted also to psychology, teamwork was almost never used (Druckman, Kuklinski, Sigelman, 2009, p.501).

So far, engagement in interdisciplinary research was viewed more as a tendency and motivation of individual researchers, but it is obvious that internal motivation is insufficient. Adequate institutional, administrative, cultural, financial and other specific conditions or prerequisites are necessary for such activities to take place. It is important that such factors not only contribute to the emergence of such initiatives, but also facilitate successful project implementation and completion that will be discussed in the next chapter of the article. Literature brings out quite a few factors that affect initiation of interdisciplinary research, and these factors cannot be viewed in isolation but as a system (Porter, Roessner, Cohen, Perreault, 2006, p.191). Interdisciplinary research in political science in the strictest sense of this concept is rare; in most cases a representative of one discipline gets involved in another. This is explained by the fact that the results of interdisciplinary research as a team effort are affected by various contextual factors (Druckman, Kuklinski, Sigelman, 2009, pp.502–503). One of the most important factors is funding. If researchers have reasonably available funding to conduct research in the framework of the discipline, then, of course, additional funding for interdisciplinary projects is less important motivator than in the case of any research funding being very low. In political science the emphasis is placed on the necessity to promote interdisciplinary research with additional funding, which is rarely granted (Druckman, Kuklinski, Sigelman, 2009, p.505).

Another quite critical factor in the initiation of interdisciplinary research and successful implementation of the projects is training (Porter, Roessner, Cohen, Perreault, 2006, p.192). As it has been mentioned, interdisciplinary research is complex not only from a scientific point of view but also from the administration and management perspective, which often is not the strong point of specialists of specific areas. Furthermore, a variety of psychological aspects are also important, for example, active communication between the parties is required, for which they must be prepared. Therefore, specific training programmes on these issues may encourage the potential researchers involved in interdisciplinary research, as well as provide them with the knowledge and skills needed for its successful execution. In addition to practical training there can also be more theoretical seminars or discussions on the potential of interdisciplinary research, its necessity, of topics, issues and the like. Such measures play not only an informative or analytical role; they also provide opportunities for communication and discovering colleagues' attitudes. Even if one of the parties displays the initiative to launch an interdisciplinary research, it may hindered by the doubts concerning colleagues' responsiveness and willingness to engage, while joint measures, in turn, can be helpful in understanding the opportunities. For the research systems that do not have extensive experience in interdisciplinary

research, such an approach might be more appropriate than the promotion of interdisciplinary research supported by grants.

Based on the mentioned above, it can be concluded that motivation for the implementation as well as promotion of interdisciplinary research can come from two different directions. Firstly, this can come from researchers themselves who are driven by curiosity and self-initiative. Secondly, this can stem from 'above,' or from the management of the scientific institution, science policy developers and a variety of donors, who act on the motivation of topical problems and motivate researchers financially or by other mechanisms. In reality the causes of motivation often involve both of the above because if one of them is missing it is unlikely that an initiative to implement interdisciplinary research projects might arise. From an institutional perspective or motivation, fostering interdisciplinary research in research institutions can be used as a tool for the modernization of these institutions, which often is defined as a requirement for their development. For this reason, the concept of interdisciplinary research is common in university strategy and planning documents and various advertising materials. The development of interdisciplinary research in research institutes may be subject to different trends of activity, i.e., they may be problem-oriented or more traditionally discipline-oriented. If the research institute is problem-oriented, then it will be more likely to implement interdisciplinary research than in the case of it being discipline-oriented.

In Latvia detailed aggregate information on interdisciplinary research that is carried out in universities and research institutes is not available, but it is clear that this activity is not widespread, so it is difficult to judge whether initiative and motivation to implement such research are in existence. One motivator of interdisciplinary research in Latvia is funding, which is available as the European Social Fund supports the activity of "Attraction of human resources to science" to foster the formation of a new research groups of interdisciplinary research directions.[2] This guided motivation of interdisciplinary research can lead to initiatives to seek for new opportunities for such research even after the termination of public funding.

For the commencement and successful progress of an interdisciplinary research initiative, a set of various enabling factors is necessary. These factors can vary from individual to organizational and national policy factors. Furthermore, it can be concluded that if someone wants to promote such research, the very promotion is a multifaceted process, and it will be treated in the following part of the article.

4. Opportunities for Facilitation of Interdisciplinary Research

This last section of the article will address such issues as how to facilitate interdisciplinary research and whether it is necessary, who can do it and

[2] See also: Latvijas Universitāte (University of Latvia), *ES Struktūrfondi zinātnē.* Available at: www.lu.lv

how it can be done. On the one hand, we have already brought out the various potential benefits that multi-disciplinary research can provide, especially the offer to address complex issues and problems of public concern. The importance of the climate for interdisciplinary studies, or a system of factors, was highlighted which must exist for interdisciplinary research to be successfully initiated and implemented. All this points to a general need to think about the instruments to promote such a specific and promising research activities since support for interdisciplinary research can be defined as one of the cracks or deficiencies in research funding systems. On the other hand, there are also important, even fundamental objections. The first of these is related to the ubiquitous current financial constraints. Under such conditions, additional expenses for the promotional activities are not appealing, especially given how difficult it is to create and control the system of promotion of interdisciplinary research. Besides, it is important to consider the fact that interdisciplinary research by its very nature and form is more expensive. Another objection may be associated with the vague understanding of interdisciplinary research, undeveloped definitions, and different ideas about it. This causes a legitimate question: with no clear understanding, how can researchers make progress in their work to satisfy the expectations of their clients, sponsors or their own defined standards, and how can policy-makers evaluate the results if the demands are unclear?

Promotion of interdisciplinary research is complicated not only from the ideological point of view, namely, whether to undertake it or who would do it, but also from the organizational perspective. The traditional incentive system in science works according to science disciplines and is organized around them. Research support programmes and other mechanisms are usually administered by disciplines, while the new interdisciplinary projects require also a new management approach. In addition, interdisciplinary research centres rarely are autonomous; usually they are part of a larger institutional body (Klein, 1990, p.47). However, at least initially, the biggest challenge is for the science policy-makers to have the knowledge of the ongoing restructuring processes in science that are related to the development of interdisciplinarity and problem orientation.

It is only through knowledge and understanding of the uncertainties associated with this concept, as well as with governmental support for such research that good and effective solutions can be offered. For example, the US National Research Council conducted a study exploring the situation and identifying the ongoing interdisciplinary research activities, as well as carrying out a thorough analysis (Porter, Roessner, Cohen, Perreault, 2006, p.188). Similarly, it is important to be aware of the interdependence of interdisciplinary research and innovation, which for policy-making means that it is not just the nature of science policy, but also all central players should be involved in innovation policy towards its promotion. In a policy-making context, it is also important not only to talk about interdisciplinarity, its promotion and opportunities, thus creating a broad and general discourse, but also to clarify these issues knowing that the conceptual ambiguity characterizes this phenomenon everywhere in the world and

this is not a good background for new initiatives. Thus, one of the central policy challenges would not only be limited to the identification of potential research directions and cooperation opportunities, but also to encourage discussion between the persons involved or to be involve in these studies about the nature and problems of interdisciplinarity, which in turn can help to clarify this phenomenon.

An important prerequisite for interdisciplinary research are people who are willing to engage in it. Interdisciplinarity in education is one of the first steps that should be defined in the context of education and science policy. Related to this is the ability of policy makers to balance the entrepreneurs' demand for specific professionals to be graduated by universities, as well as demand for people with multi-disciplinary thinking to tackle various specific problems. One of the initiatives in the tertiary-level studies in Latvia in this field is the creation of interdisciplinary doctoral schools which could potentially serve as a bridge between educational programmes and possible joint research projects. However, in view of the fact that individual-level characteristics of researchers are often emphasized, it is necessary to think also about the educational system in the earlier levels prior to the university level, at which human abilities and the potential for cooperation and interdisciplinary thinking are initially formed. Literature on interdisciplinary research highlights the need to integrate social and natural or engineering sciences as one of the central challenges of today's universities, which largely determines the essential present-day problem. The solution to this problem requires an interdisciplinary approach (Miller, 2010, p.343).

The previous challenge is related to another, namely, whether the various promotional instruments (especially such as grants) actually contribute to interdisciplinary research rather than traditional projects, which are disguised under the term for funding purposes. This likelihood requires good understanding of interdisciplinary research, as well as a qualitative system for the examination of research applications by science administrators. Otherwise, there exists the danger that the concept might be misunderstood and traditional projects, instead of interdisciplinary research, get the support. Methods for the evaluation of traditional research project applications and their results are not satisfactory in the case of interdisciplinary research, for example peer review, performed by non-participating experts of the same research discipline, and involves a risk that the project will be assessed from the perspective of only one discipline. However, a challenging argument for academic environment in terms of interdisciplinary research with peer review evaluation is voiced by Holbrook who indicates that peer review should not be left solely in the hands of experts in the academic disciplines. Instead, the evaluation panel should include the public representatives and policy makers who are affected by the particular study (Holbrook, 2010, p.331). Also, the use of scientific publication citation indices is not an effective method of project appraisal for publications and indexes are discipline-focused. This is not just a hypothetical problem, it is real and identified in previous studies whose

authors point out that very often various aid schemes do not provide the monitoring of interdisciplinarity level in research projects (Weingart, Stehr, 2000, pp.32–33).

An interdisciplinary project as an entity consists of a variety of disciplines, and each discipline professes its idea of quality and its assessment. However, such an approach to the evaluation of interdisciplinary research has its own logic, since the aggregate quality can be derived from the excellence of its elements (individual disciplines), yet it is obvious that such an approach to a certain extent discipline negates crossing the borders of disciplines (Huutoniemi, 2010, pp.309–313). For this reason, however, it would be necessary to think about a new, specific method for the evaluation of interdisciplinary research, but this again would involve creation of border lines between disciplinary and interdisciplinary science research (Huutoniemi, 2010, pp.314), which can only exacerbate the discussion on this topic. The most felicitous comment on interdisciplinary research assessment is the one which says that such a creative activity as interdisciplinary research cannot be organized according to any pre-established mechanisms (Cech, Rubin, 2004, p.1166). Those sceptical about the concern for interdisciplinary research evaluation are also those who point out that the people who carry out this work always attach great subjectivity to the established criteria, regardless of whether the research projects involve a single discipline (and seem to be easier to assess) or interdisciplinary research (Huutoniemi, 2010, pp.316). This draws attention on the fact that it is not the evaluation criteria but the evaluators themselves that are very important because in the case of interdisciplinary research they should possess a wider mental outlook and be able to identify the essential nature of each initiative (Huutoniemi, 2010, pp.317). This debate brings out an important issue to be taken into account when considering the promotion of interdisciplinary research.

Looking at what is being done in different research institutes and research policy institutions all over the world to foster interdisciplinary research, it appears that the possibilities are quite extensive and various, demanding different funding and with different involvement level or intensity of activity. Promotion of interdisciplinary research offers space for creative expression for administering institutions and policy makers: the following briefly outlines just a few of the possibilities for the management of scientific institutions and science policy to promote interdisciplinary research. For example, the British Research Council sets up research networks involving researchers from different institutions but are headed by the leading researchers of the major centres who are bright personalities with leadership abilities and who seek to complement and expand their research activities.

As mentioned above, one of the major obstacles to launch interdisciplinary research projects often is the researchers' own view that researchers of other departments are not interested in them, thus, to prevent this situation, there are various measures to facilitate the exchange of information on the existing interdisciplinary research, such as the idea cafés, workshops, quick networking events and the like. Without these, the new beginner interdisciplinary research teams are awarded with start-up financing to

test the idea, similarly as initial financing for launching a new business.[3] Funding for interdisciplinary research is often necessary not only at an early stage but also later. For example, political science researchers who study voter behaviour are interested in cooperation with experts in psychology, but other disciplines show less interest in co-operation and from a financial perspective are unwilling to engage in extensive multi-year projects, unless there is a dedicated funding available (Druckman, Kuklinski, Sigelman, 2009, p. 504).

Translation services are offered if an interdisciplinary team consists of people speaking different languages, and there are facilities and infrastructure for such research, as well as mobility programmes for researchers to venture in other disciplines.[4] Universities use a bonus system for participation in interdisciplinary projects, and also structural units are formed to support interdisciplinary projects or programmes (Miller, 2010, p.346).

Promoting interdisciplinary research can be on the science policy-makers' agenda, and it can be the concern of the management of scientific institutions as well as international institutions that finance research, but there may also be a situation where it is up to the researchers who are interested in interdisciplinary research to take care of the research management, including the funding search, organization, topic identification and other issues. This situation is a reality when the other above mentioned players are not interested in this matter. However, given the complicated process of interdisciplinary research from the perspective of scientific use of theories and methodologies and leaving its administration in the hands of researchers themselves is not an optimal solution. Therefore, the facilitation of interdisciplinary research should be considered at least at the level of the administration of tertiary level education establishments. From the perspective of political science the important players in this respect are also various funding organizations, professional associations and scientific journals, which should support interdisciplinary research by developing appropriate standards of assessment (Druckman, Kuklinski, Sigelman, 2009, p.505).

5. Conclusions

As shown by the various interdisciplinary aspects that have been addressed in this article, it is a complex phenomenon, which should be taken into account by the involved parties. The discussion of the conceptual aspects of interdisciplinarity and its practical efficiency in Latvia is not wide-ranging, but it would be highly welcome. The central discussion related to interdisciplinary research is not a matter of better organization, financing or facilitation; the issue is rather the division of research activities into disciplines which is not so strict as long as interdisciplinary research is carried out. Admittedly, the discussion also includes the question of organizational elements. The

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[3] See also: Interdisciplinary Research at Cardiff University. *Facilitating Interdisciplinary Research.*

[4] Ibid.

discussion can be initiated by the administrators of national science policy or the management of scientific institutions. Unlike the traditional promotion of scientific activities, interdisciplinary research strongly depends on its organization within the framework of scientific institutions, which are also its principal promotional institutions.

Experience of the world universities, higher education institutions and research centres shows that opportunities to initiate and promote interdisciplinary research are very different and not all of them require substantial financial resources, so declaring the lack of funding as an impediment to interdisciplinary research means demonstration of lack of initiative. The various options to promote interdisciplinary research can be explained by the specific nature of interdisciplinary research and launch it, as highlighted in this article, which points to communication and organizational problems that can be eliminated even without significant financial investment. Meanwhile, the funding for such research can be found by re-dividing the total research resources available, although this may be delayed by the discussion on the organization of science into disciplines as opposed to interdisciplinary approach.

Local communities, regions, countries and the international community in a globalised world are increasingly facing variety of large and complex problems. These problems are determined by the increasing migration, instability in financial markets, demographic trends, climate change, terrorism, depletion of non-renewable energy resources and other factors. The solutions of these problems often require complex thinking and approaches that may be offered by interdisciplinary research which is becoming an important activity in today's research institutions. Latvian researchers, administration of research institutions, policy makers and the public should be aware of it; this phenomenon should be understood; they should define the challenges and, together with international partners, exploit the opportunities offered by scientific activities in order to improve everyone's lives. However, we should keep in mind that science can produce the best results if it is organized deliberately.

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Roswitha M. King

Perspectives on Interdisciplinarity in Academia

Abstract

Interdisciplinarity is, by some, viewed as an antidote to the damage done by excessive specialization. Others retort that then the term 'anti-disciplinarity' may be more fitting, and are quick to point out that interdisciplinarity is deeply indebted to those who immerse themselves in specialized fields of study. In other words, without specialist, interdisciplinary environments would be poorer. Moreover, when novel solutions to problems emerge from interdisciplinary collaboration, valuable information is channeled back to the individual constituent disciplines. These 'upstream' and 'downstream' flows clearly point to the relations being complementary rather than adversary. This paper explores a number of aspects concerning interdisciplinarity in academia – for example, why it has been so difficult to establish interdisciplinary degree-giving academic programmes.

Keywords: interdisciplinarity, academia.

1. Introduction

Interdisciplinarity is different things to different people. To some it is a means to an end, to others it is an end in itself. As means to an end it is sometimes understood as means to greater insight, or toward more successful problem solving, or as means toward achieving or maintaining the good life. Interdisciplinarity is also thought of as a philosophy of knowledge.

All things considered interdisciplinarity may be understood as a resurgence of the desire to see the 'bigger picture'. It is, then, a response to a very old question.

On a more operational level interdisciplinarity is, of course, also a reaction to the perceived shortcomings of disciplinary knowledge. With all due respect and gratitude toward what it has given us, disciplinary knowledge can be viewed as a kind of abdication. Cloistering in their proverbial ivory towers around discipline-specific standards of excellence and relevance academics have cultivated an avoidance of responsibility toward society. How their discipline's knowledge can be beneficial toward building a good society – that is someone else's business. Interdisciplinarity is, in part, an orientation toward reflecting and acting on such matters.

It is not surprising that disciplinary academic traditions have raised a bias toward the 'deep' rather than the 'broad'. Interdisciplinarity as a philosophy of knowledge would strive to strike a balance, respecting the ecology of knowledge reminiscent of what Heidegger (1992, 2002) referred to as *Denken,*

an attitude and practice that pays tribute to depth, breadth, timeliness and relevance to society.

Much has been said about the benefits and synergies coming from interdisciplinary collaboration or interdisciplinary activity of an individual, ranging from the observation that real world problems do not arrive neatly packaged by disciplines to the realization that the two camps are naturally complementary. So then, why, to this date, is it so difficult to establish and sustain interdisciplinary academic degree granting programmes?

2. Disciplined-based Attempts to Understand the World

In so-called Western societies the tradition has established itself to attempt to understand the world along distinct channels tied to disciplines and their methodologies. In the background hovers the assumption or hope that once we understand all the separate parts we will be able to synthesize them and eventually understand the whole. Higher education institutions (and actually it already starts in elementary schools and high schools) convey by curriculum and by role models that knowledge is produced and consumed in parallel in a number of disciplines. Professional as well as social networks have developed along disciplinary lines. It is the people you professionally associate with every day that, typically, also turn out to be the network you turn to socially. Being integrated into a discipline is perceived to be good for one's career, and, in turn helped the advancement of the discipline.

It has, however, not gone unnoticed that there is another side to the coin. Disciplines put severe constraints on the questions one dares to ask. The conceptual and experiential co-ordinate system of a particular discipline frames the range of 'admissible' research questions as well as the range of 'legitimate' methods of investigation. And not only that – even the range of 'legitimate' answers is pre-ordained (Kuhn, 1977; Becher & Trowler, 2001; Biglan, 1973a, 1973b). Breaking out of these constraints is among the motivations for interdisciplinarity.

Shared perspectives across disciplines will encourage interdisciplinary work. In this context Crane (2001) points out that 'acceptability of a new idea' depends on the cognitive distance, or the amount of cognitive reshuffling necessary to integrate the new idea into one's existing cognitive co-ordinate system. In the same vein Gold and Gold (1983) point to how similarities in cognitive structures can promote collaboration between people anchored in different disciplines.

As is the case with collaboration in general, communication difficulties can be a formidable barrier to successful interdisciplinary work. After all, the disciplinary lingo is one of the glues that hold disciplines together. Discipline-specific jargon provides a convenient shorthand, as pointed out by, for example, Becher and Trowler (2001). Some disciplines, such as mathematics, possess a collection of special symbols that are not found in common language. There also exist significant differences between disciplines in how the work of peers is judged, and how arguments are formulated. Bauer (1990),

for example, shows how communication problems among interdisciplinary team members retard progress on research projects.

3. Interdisciplinarity Defined

The literature offers many definitions of interdisciplinarity. Some of them focus on the integration of distinct disciplines via collaboration, others imply a rejection of disciplinary knowledge, some have a practical bent, while yet another group stresses epistemological considerations. Here we adhere to the relatively broad and 'tolerant' definition given by the Centre for Educational Research and Innovation CERI (OECD, 1972). The focus is on interdisciplinary interactions:

> "Interdisciplinarity – An adjective describing the interaction among two or more different disciplines. This interaction may range from simple communication of ideas to the mutual integration of organizing concepts, methodology, procedures, epistemology, terminology, data, and organization of research and education in a fairly large field. An interdisciplinary group consists of persons trained in different fields of knowledge (disciplines) with different concepts, methods, and data and terms organized into a common effort on a common problem with continuous intercommunication among the participants from the different disciplines" (OECD, 1972, pp.25-26).

It should be noted that while the above definition relies on a disciplinary anchoring of interdisciplinarity, it, nevertheless, accommodates postmodern interpretations. This is because the postmodern critique of disciplinary inquiry does, in the act of critiquing, engage the disciplines. The definition also allows for a large spectrum of 'intensities' of interdisciplinarity by accommodating everything from informal conversation to structured research and teaching.

4. Intrinsic Drivers of Interdisciplinarity

With the expansion of disciplines came increasing complexity. This, in turn, led to subdivisions of disciplines into specializations, distinguished by both the types of research questions and the types of methodologies applied. This fracturing into separate specializations propelled a certain readiness to question traditional disciplinary frameworks, methodologies and opinions on what constitutes good quality in research. And this in turn propelled the further growth of the disciplines. This led to a situation where often members of different specializations within a discipline did not have any more in common than members of different disciplines. In this way crossing borders between disciplines did not feel much different from crossing borders between specializations within a discipline. Take, for example the discipline economics. A member of the specialization history of economic thought may actually feel less 'cultural distance' to a member of the discipline history, than, say to a fellow economist with a specialization in econometrics. Thus, one driver of interdisciplinarity comes from the members of the disciplines themselves, who recognize commonalities across disciplines as well as

estrangement from other specializations within the same discipline. At the risk of sounding overly dramatic one could say that the evolution of the disciplines carried within itself the seeds of disciplinary self-doubt.

5. Extrinsic Drivers toward Interdisciplinarity

Another driver of interdisciplinarity comes from pressing societal challenges that seem to defy 'simple' discipline-based solutions. Here the evolution of interdisciplinary inquiry to date is of interest. Initially interdisciplinary inquiry was of the 'instrumental' kind, i.e. solution to a problem was invited, and a collection of investigators from a collection of disciplines applied a collection of 'imported' methods to arrive at a collection of disciplinary perspectives on the issue at hand. While this approach continues to be deployed, other scholars, with a more holistic concept of a 'solution' to a problem where not shy to disrupt traditional discipline-based discourse and to question conventional definitions of knowledge.

In the US, for example, the Social Science Research Council was founded in the 1920s to drive forward integration among social science disciplines. During the 1930s and 1940s concerns about societal events and developments, such as war, migration, crime, and social welfare programmes cried out for attention from more than one discipline (Klein, 1990). This found expression, for example, in the emergence of area studies at US universities during the 1930s, which continued to flourish until the 1970s.

A new extrinsic driver of interdisciplinarity came in the form of World War II, with its problem-driven demands from military and political interests. This issue-based interdisciplinary research orientation persisted into the 1970s and opened new funding channels in the form of, for example in the US, the National Science Foundation and the National Institutes of Health. During the 1970s, interdisciplinary research shifted focus to areas such as environmental protection, product safety and technology assessment (Lattuca, 2001).

6. Circling the Wagons

The emergence of the interdisciplinary 'insurgents' with a strategy of undermining and deconstructing discipline-based concepts of knowledge – real or imagined – brought forth defensive/aggressive behavior on the part of the disciplines. While initially the main criticism of interdisciplinary scholarship was that it was devoid of rigorous analysis and beset with dilettantism (and this kind of criticism is certainly continuing to this date), now another dimension of criticism became fashionable: Interdisciplinarity was to be opposed on grounds of infecting peoples' minds with pernicious ideas based on untenable assumptions of post-modern thought and aimed at undermining and discrediting the good work of discipline-based scholars.

Alas – interdisciplinary scholarship had become something to be reckoned with.

Interdisciplinarity as a critique of the disciplinary concept of knowledge found its expression in, for example, parts of women's studies, ethnic

studies, and literary studies. Promotion of interdisciplinarity, however, also became associated with movements along a broader front: a re-definition of knowledge and knowledge construction/acquisition. While some scholars aimed at integrated interdisciplinary perspectives, for others, particularly in the feminist, poststructuralist and postmodernist camp, re-defining knowledge took the form of derailing disciplinary perspectives. It is this latter movement that prompted the vigorous and sometimes shrill attacks against interdisciplinary efforts by the traditional disciplines.

As a side note it should be remembered that what we now consider to be the 'normal' spectrum of academic disciplines had its own 'growing pains'. Up to the late 1800s the 'medieval structures' were in place. The study of arithmetic, geometry, astronomy, and music, as well as logic, grammar and rhetoric prevailed, preparing students to move on to natural philosophy (late called physics), moral philosophy (later called ethics) and mental philosophy (later called metaphysics). This structure came under pressure during the early 1800s. Students began to voice their demands to have advances from science and industry represented in the curriculum. Demands for engineering, the natural sciences, and mathematics, but also literature, history and philosophy became louder. It was a long road from initial student demands to their implementations. The medieval model prevailed until the late 1890s. Thereafter the now familiar academic disciplines dominated the scene, and increasing numbers of sub-specialties developed, as already mentioned above (Lattuca, 2001).

7. Demographics and Critical Mass

As there are still few interdisciplinary degree granting academic programmes relative to programmes in traditional disciplines, it turns out that most team members of interdisciplinary ventures have been trained in traditional disciplines. It is in this context that they must learn to value perspectives and methods that are different from their own training and discipline-specific culture. That is, most participants in interdisciplinary activities remain deeply anchored in their home discipline. This makes them presumably relatively low-motivated promoters of the concept and practice of interdisciplinarity. In this view interdisciplinary programmes have difficulties establishing themselves because of a lack of true champions.

It also has not gone unnoticed that the number of interdisciplinary academic journals is still rather modest in comparison with disciplinary ones. This has spun a narrative that it is difficult to get interdisciplinary research published.

8 Cultures and Careers

Collaborative ventures across discipline boundaries in social sciences, for example, are familiar with the disparaging word 'soft', as in 'lacking in

rigor'.[1] Anybody having worked with economists, for example, will have run across this verbiage. The ensuing attitudes can render career paths along interdisciplinary lines relatively unattractive and risky.

Social conventions are ever present when it comes to evaluating 'appropriate' topics for research, the type and structure of research questions and their answers. These discipline-specific judgments, not surprisingly, lead to different understandings of what constitutes good scholarship.

Viewing disciplines as cultures points to the community, the faculty life, as an important source of behavioral differences between disciplines. Schein (1986) points out that the effectiveness of a group is influenced by how clearly the boundaries of the group are defined. Clearly understood boundaries tend to instill a stronger sense of group identity to a member. Clark (1983) further highlights that faculty members in very prestigious universities tend to identify themselves more strongly with the profession than with the institution, due to their frequent interaction with national and international networks of colleges of the same discipline. In this context, already as a graduate student one seeks acceptance into the community of scholars of a particular discipline – and with it comes a certain sense of loyalty to the tribe.

This, in part, explains one of the perceived impediments to interdisciplinarity at universities: that faculty members experience a loss of disciplinary identity when they leave their 'home' communities to join a interdisciplinary program. They may also be hesitant to abandon a position of influence and reputation that they may have achieved after many years of hard work in their own discipline, as Becher and Trowler (2001) point out.

With reference to the above mentioned 'demographic' issue concerns arise regarding evaluation of interdisciplinary grant applications – when it must be assumed that the referees are drawn from traditional disciplines – and failure to obtain funding may originate from non-understanding.[2]

Among younger academics, in particular, the spectre of unsympathetic promotion- and tenure review committees, with imputed hang-ups on key words such as 'soft' and 'lacking in rigor', can be a formidable deterrent, based on the perception that interdisciplinarity is not good for your career.

And, as Birnbaum (1981) demonstrates, among interdisciplinary scholars we find a high incidence of people, who are not concerned about tenure – either because they already have it, or because they are not in tenure-track positions. Furthermore, non-tenured academics in tenure-track positions expressed some trepidation about the effect of their interdisciplinary activity on their career prospects.

During periods of budgetary contraction it is often the interdisciplinary centres that bear the brunt of financing cuts. Partly this is due to traditions

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[1] Likewise, of course, academics anchored in 'soft ' disciplines may think of rigorous quantitative approaches as 'bit-headed' lack of capacity for the bigger picture.

[2] Here it should be noted that the recognition of these difficulties has led to reserving certain funding for interdisciplinary work. In this context the European Commission, for example, stands out in providing research funding for interdisciplinary work.

in budgetary channels at universities (i.e. through the disciplines), partly this comes from the perception that interdisciplinary units are 'outreach activity' and therefore peripheral, in contrast to the disciplines that are seen as forming the core of the institution. This brings us to political economy considerations.

9. Political Economy

Regarding budgetary negotiations essentially as a zero-sum game, the establishment of new interdisciplinary programmes or centres is frequently viewed with a jaundiced eye by the established disciplines. It is a resource war and new competition for funds is not exactly welcome. In the same vein, interdisciplinary units may, in times of budgetary distress, be the first ones to be closed down.[3]

Interdisciplinary programmes often have an uphill struggle simply because departmental structures of universities and colleges are oriented on disciplines for both teaching and research. Likewise the institutional reward and incentive mechanisms are arranged around disciplines. However, it is not clear whether individual behavior is dominated by institutional rewards or rather by individual preferences and standards. Nevertheless, departmental structure of higher education institutions, typically oriented along disciplinary lines, has been consistently mentioned as a problem for interdisciplinary research (Lattuca, 2001).

Interdisciplinary course programmes also are negatively impacted when there is pressure on resources. Often interdisciplinary education programmes operate with 'loaned faculty' from various disciplinary departments. These source departments will withhold faculty whenever their own departmental teaching needs are high. This, in principle, can be easily remedied by affiliating dedicated faculty directly with the interdisciplinary unit. In practice, however, we do not see this very often.

Fourcault (1979) places the concept of discipline in relation to the concept of power, endowing 'discipline' with the attributes of behavior regulation and norm that obey the directives of a distinct system of power. This power extends to recruiting and dismissing, rewarding or punishing interdisciplinary scholarship, promoting and demoting interdisciplinary scholars. For example, according to Salter and Hearn (1996, p.17), "Academic disciplines are evidence of the political deployment of knowledge products."

10. Autonomy

One of the issues in the discussion of interdisciplinarity centres on autonomy – or rather the lack thereof. When it comes to staffing interdisciplinary units joint appointments tend to be the norm, such that a staff member is

[3] For example, it has been observed in the US that well established interdisciplinary bachelor studies have been closed down, although student enrolment was substantial.

associated with an interdisciplinary unit as well as with a disciplinary unit. Traditional thinking then follows the line that the specialized discipline provides the 'home unit' and the interdisciplinary one provides an 'outreach unit'. With regard to the above-mentioned tenure concerns, if, as is often the case, it is the 'home unit' that is responsible for the tenure decision, jointly appointed staff, being risk averse, will tend to gravitate around the tenure granting discipline. This is likely to result in reduced commitment to interdisciplinary work.

One way around this has been for interdisciplinary academic areas to actually become disciplinary. For example the creation of disciplines such as biochemistry, biomedical engineering, and neuroscience has followed this path. Practical benefits have come in the form of dedicated research funding, independent tenure decisions, as well as general visibility. Whether this development – interdisciplinary disguised as disciplinarity - has helped or hindered the progress of interdisciplinarity in general is a matter for debate.

11. Criticism of Interdisciplinarity

It is widely agreed, by supporters and detractors alike, that the most serious critique regarding interdisciplinary programmes is their lack of synthesis. Programmes offer a collection of disciplinary perspectives providing a multitude of views without guidance toward forming a bigger picture. This fragmented view can be gleaned from listening to conversations among students in interdisciplinary (multidisciplinary) masters programmes. Assessing their prospects for good grades they talk about 'easy courses' – those from within the discipline in which they received their bachelor degree. 'Hard courses' then are those from 'foreign' disciplines. It is not uncommon to hear students say that of course they expect to get a top grade (A) in the 'easy courses'. But that for courses from 'foreign territories' a middle-of-the-road grade would, naturally, be acceptable.

Critics of interdisciplinary programmes, particularly undergraduate programmes, sometimes voice the opinion that it is unreasonable to expect students to have the necessary intellectual maturity to understand the common themes that disciplines communicate in their different forms. Defenders, on the other hand, are quick to point out that students typically tend to have a greater capacity for interdisciplinary concepts than their instructors because they have been less exposed to the 'brainwashing' of disciplinary tunnel vision. Defenders invite to review the type of questions asked, on average, by grade school students, high-school students, bachelor students, masters students and Ph.D. students, and to note the monotonically decreasing interdisciplinary of the questions asked that accompanies the increasing maturity of the young people. In addition defenders stress the importance of developing interdisciplinarity as an attitude – a habit of mind – and that this is best begun early on.

12. Complementarities

Interdisciplinarity is, by some, viewed as an antidote to the damage done by excessive specialization. Others retort that then the term 'anti-disciplinarity' may be more fitting, and are quick to point out that interdisciplinarity is deeply indebted to those who immerse themselves in specialized fields of study. In other words, without specialist, interdisciplinary environments would be poorer. Moreover, when novel solutions to problems emerge from interdisciplinary collaboration, valuable information is channeled back to the individual constituent disciplines. These 'upstream' and 'downstream' flows clearly point to the relations being complementary rather than adversary.

In addition, what on first sight may look like irreconcilable epistemological differences often, upon deeper scrutiny, turn out to be nothing but inter-departmental resource wars in disguise. So this may be less about philosophy of science but about more mundane things like money, office space, recruiting and prestige. So rather than hiding behind make-belief epistemological arguments we should be looking for administrative solutions to resource issues. But this means that the solutions to the perceived problems are much simpler than often assumed, and essentially hinge on political will.

13. Concluding Remarks

On the operational end legitimizing interdisciplinarity calls for demonstrating that the intellectual and societal benefits coming from interdisciplinary scholarship substantially outweigh the difficulties encountered.

From a historical-evolutionary perspective we should not forget that institutionalized interdisciplinarity is still in its infancy. It took a century for the now firmly established disciplines to be fully accepted and implemented. The disciplinary movement itself was a response to the perceived shortcomings of the holistic view of the causal ordering of the world offered by metaphysics: "That everything was the will of the gods." The disciplinary movement was a response to new demands of the world. If we now feel overwhelmed and frustrated by the flood of specialized and disconnected information hitting us every day, well, the interdisciplinary movement is a response to that. After a period of necessary and desirable reducing, separating, analyzing and specializing the demands of the world call for synthesizing and transforming information into knowledge – not to replace the disciplines but to complement them.

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Indriķis Muižnieks
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Scientific Research Today – Challenges and Solutions for Latvia

Abstract

The article analyses existing problematic issues, challenges and solutions in academic environment in Latvia, in particularly, focusing on issues related to scientific research as well as research and development in its broader terms touching also the roots of scientific and economy development – knowledge. European Union recognizes the knowledge economy and knowledge society as the basis of sustained growth and improved quality of life. The knowledge economy concept and awareness of useful knowledge extraction and universities` role in this process has remained topical for centuries.

There are both theoretical and practical backgrounds from social sciences, humanities, history, and politics used in article for characterization of the existing situation, comparison of different approaches in usage of knowledge, and identification of common and different experiences among countries and their public and private areas.

In the second part of the article authors remind about various conventional and provide also specific recommendations to ensure the existence and growth of Latvian academy, which is very important precondition for development of knowledge based economy.

Keywords: Science, Research and Development, Knowledge Economy, Academia, Latvia.

1. Introduction

Serious economic analysis shows that the Research and Development (R&D) is the only sustainable technological development source, which is indispensable to the growth of labour productivity, competitiveness and gross domestic product (GDP) (Romer, 1990, pp.71-102).[1]

Competitiveness of higher education is based on its ability to respond adequately to the demand for all three types of knowledge application in the knowledge economy – knowledge acquisition, usage and creativity. Therefore, the main principle of Humboldt`s time University (integrity of studies and science in terms of research work-based studies` programmes that was mainly used in European and North-American universities only after World War II) is now again to be revised or rather updated because

[1] Quote from Guellec D. and van Pottelsberghe de la Potterie, B., "R&D to Productivity Growth: Do the Institutional Setting and the Source of Funds of R&D Matter?"

of creation of new type of knowledge creativity, where it goes beyond the boundaries of scientific disciplines. As a result, new challenges are emerging in curriculum development, which cannot be accurately applied for a specific discipline and also the evaluation of academic staff performance requires a new, broader approach.

European Union (EU) recognizes the knowledge economy and knowledge society as the basis of sustained growth and improved quality of life. The knowledge economy concept and awareness of useful knowledge extraction and universities` role in this process in the EU policy documents is taken from societal research works that were carried out at the end of the 20th century. The ideas from Drucker, Gibbon and Boyer on the EU's development model are just as significant as once Marx's works on the socialism theory.

The development of knowledge society is associated with a common European higher education area, a single European science area and with innovations – success of knowledge commercialization. Universities have the potential to operate in all three of these areas, thus becoming the most important resource for meeting the EU's growth objectives. In order to respond to the challenge universities must strengthen their operational capacity and cooperation with social partners; they should become more open to the public and should find its specific niches and differentiate their operational tasks. Similarly as universities in other EU countries, the Latvian universities and other academic institutions must earn their score of operating efficiency and quality both at national and international level.

The "knowledge economy" is widely used and a staple buzzword in the European Union (EU). Its popularity is rooted in the Lisbon Strategy, that was adopted by the EU Council in March 2000, and originally declared the very ambitious target - to become "the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth, better jobs and greater social cohesion by 2010"(European Council, 2000). However, it is to be admitted that Lisbon meeting was immediately followed by crises of businesses in areas of new technologies, especially information and biotechnology, and the EU's overall economy fell deep into stagnation. It is hard not to remember the history at this point: delighted about short-term economic prosperity in late 1950's, Soviet Union in late 1960's adopted a strategy (XXII Congress of the CPSU) "to achieve and overtake" the United States and build a communism in twenty years build communism. In 1970ies when economy stagnation appeared the communism turned into "real socialism." Coming back to nowadays, as a result of global economic and financial crisis the Lisbon vision had to be lowered – the report of 2004 predicted the fail in achieving the initial goals, but still the strategy was vitally needed otherwise not only the US, but also Asian competitors would go far of reach distant. On the basis of this so-called Wim Kok's report in 2005 EU declared its main strategic objective: "to implement rapid and sustained growth, increasing more and better jobs" (European Commission, 2005). Knowledge society is no longer invoked, but it had not disappeared since both the original and later adjusted strategy emphasized: "Knowledge and innovation is the cornerstone of growth" (Grens (ed.), 2007).

Also today, the knowledge economy continues to be one of the most important settings and topical homework of the EU in competition with the US and the world's growing economies - India, China, and Brazil. In 2010, EU countries adopted the new European Strategy for Growth and Jobs - EU2020 strategy, which essentially maintains the Lisbon objectives – development of knowledge-based, sustainable and inclusive EU economy model. Lisbon strategy also failed to achieve the desired intensity of R&D support (3% of EU GDP), so now this objective is included also in the new EU2020 strategy drawing much more attention to skills development and creation of innovations, and also to specific objectives in the field of education and R&D (see also the article by F.Flight, S.Zhuete on education and its role in the EU2020 strategy).

2. Knowledge Economy - an Important Precondition for Scientific Research

Although there is a question as to whether it is a knowledge economy that promotes scientific research, or vice versa, but it is clear that if the national strategic development documents sets a vision to knowledge economy-oriented development model, then it will contribute to some extent the scientific research development in the country.

Sources of knowledge economy are mainly two areas (see Table 1), which were already identified and agreed upon in EU shortly before the adoption of the Lisbon Strategy: a) the single European higher education area, which was formulated in June 1999 (European Ministers of Science, 1999) and b) the single European science area defined by the European Commission (EC) report to the European Parliament in January 2000 (European Commission, 2000).

Table 1. The Objectives of Formation of European Common Higher Education and Science Areas

Higher education area	Science area
• European dimension inclusion in higher education collaboration incentives, training and research programmes. • Comparable educational qualification scheme to promote the employment of EU citizens. • Student and teacher mobility. • Attracting students from other regions of the world. • Cooperation in quality assurance. • Student workload credit points (ECTS). • Three cycles` (bachelor, master, doctorate) higher education.	• Optimized resources` accumulation and usage system. • Greater coherence between Member States in usage of public funds for science. • Increasing the number of researchers and increased mobility. • Increasing the attractiveness of Europe for scientists from other regions. • Common ethical values. • Providing scientific justification of political decisions. • Increased attraction of private funding.

You might say that with this decision EU has done something that already was done quite well in the USSR - strictly separated the higher education and

science areas, providing each of them with their own, sometimes similar, but overall different objectives.

Some of the main tasks that should be done for modernization of higher education in Europe are:

a) promotion of transdisciplinary research focusing not on the science field, but on the research field, a problem, that that can be associated with multiple, complementary fields. Issue-based research can be carried out by a number of departments or faculties jointly organized in doctoral schools, which becomes the new fashion trend of the leading universities, for example, Freiburg and Vienna Universities;
b) intensify the cooperation with the public. Popularization of science should encourage the dialogue between scientists and non-specialists. More specific focus should be put on the opportunities offered by lifelong learning, as well as on broader communication strategy, which includes facilitating of conferences, open house events, traineeships and a discussion forum for structured dialogue among graduates and the citizens;
c) rewarding of the highest level excellence, attracting scientists from worldwide, developing of post-doctoral studies, building a cooperation with other universities in doctoral studies, where a critical mass of research in a specific issue is based. However, it must be admitted that the idea of a salary system based on efficiency is frightening for inefficient and self-contained academic institutions. Measurement of quality level is related to regular evaluation and comparison of academic institution`s contribution – the assessment of the scientific performance;
d) increase the prestige and visibility of European scientific activities and studies in the world, simplifying the bureaucratic procedures for incoming students, offering learning opportunities in various languages. It is important to quickly and accurately recognize academic qualifications obtained elsewhere (European Commission, 2006).

Later, in the report of May 10, 2006, the European Commission offered several significantly new features, that previously in EU higher education policy were mainly concealed:

1) the emphasis is on scientific activities relation to higher education, but it is also stated that not all higher education institutions have to contain science – so far only in the British universities had publicly defined this principle (Clarke, Ch., Secretary of State for Education and Skills by Command of Her Majesty, 2003).
2) realizing that nowadays many producing industries are not able to use universities-generated scientific 'products,' and the universities are not sufficiently open to the business environment, universities should cooperate with producing industries and manufacturers.
3) autonomy is interpreted not as an uncontrolled scope of choice and use of means, but it is associated with professional management, strategic

priorities, structured partnerships with businesses and other potential partners, in other words – opening the university decision-making also to persons not related with academic environment.

However, these notions of universities' development paths in a knowledge society are not only visions nurtured in offices of European bureaucrats. Universities` place in the knowledge economy and knowledge society was initially defined by the very same university-related community development researchers, whose names probably will once be written together with Adam Smith, Karl Marx, Karl Popper and other classics.

The author's honour of the concept "knowledge economy" is given to P.F.Drucker (Peter Ferdinand Drucker, 1909-2005), who first used this term together with other winged term "knowledge workers" in his book "The Age of Discontinuity" released in 1966. A more detailed review compared with the classical capitalist economy appears in 1993 in the book "Post Capitalistic Society," where P. Drucker (1994, pp.240) emphasizes following features of knowledge economy:

a) Theoretically there is a free competition in distribution of both resources and benefits in capitalism – free market economy. In reality there is effect of distorting influencing the economy: monopolies, patent protectionism, government intervention and so on. Knowledge economy with free competition is not possible. The initial benefits of early acquisition and usage of knowledge becomes permanent and irreversible. Both the free market and protectionism do not work purely separately – the knowledge economy needs the balance of both of these forms.
b) Development of market economy is defined by consumption and investment. The knowledge economy does not prove that higher consumption stimulates greater production of knowledge. Similarly, there is no evidence that higher investment in the economy creates more knowledge output. The tracking of cause and effect in this area is so time-consuming that it cannot be used for creation of economic theories.
c) There is a universal exchange value in the market economy – money, which expresses a resource value in a common system. In knowledge economy, there are three types of knowledge:
   - Learning and improvement or rationalization of the existing processes / technologies;
   - Usage of existing knowledge (the acquisition of licenses);
   - Innovations based on new knowledge.

The costs and impact of these processes towards economy differs, and so far they have not been measured in a common system. It could be possible to determine how much does a creation and distribution of knowledge cost, but one cannot assess how much operational knowledge is produced, and therefore it is not possible to measure the effectiveness of the knowledge economy and to make a rational choice of one or another type of knowledge acquisition. Besides, the amount of knowledge is less important than

the productivity of knowledge – it applies to existing as well as to new knowledge.

These Ducker's findings provided the basis for the Lisbon Strategy promoters' argument that science and technology development ensures 25–50% of economic growth (European Commission, 2000); these figures are probably based more on intuition than on Econometrics. It is clear that all types of knowledge (rationalization, acquisition and creativity) are significant and effectively able to operate in the knowledge economy. But potentially the usage of new knowledge has the biggest effect because of the unique advantages that result from acquiring this knowledge, in particular for the first time. However, direct economic impact of this knowledge is the most difficult to predict, assess and manage. The usage of knowledge as a result of rationalization should become a routine of knowledge economy, a fundamental innovation – celebration.

3. Main Challenges of R&D in Latvia

The report about scientific research and its quality in Latvia (Latvian President and its Strategic Analyses Commission, 2009) that followed the roundtable debate, organized by Latvian President and its Strategic Analyses Commission in 2009, quite accurately describes the current situation in Latvian scientific research, pointing out that there are serious problems in higher education, some of which are well known for example, the fact that the Latvian 'Academy' is rapidly aging. In World Bank`s report on the Latvian higher education in 2003 it is written that "the average age of professors is 56 years and the amount professors, whose age is over 60 years, is growing rapidly, 33% of professors are older than 60 years and the average age of newly approved professors is 55 years" (World Bank, 2003, pp.20). In 2007, the majority of scientists (54%) in higher education institutions were over 55 years of age. The share of the scientists in higher education who are 65 years old or older than 65 years is 25%, in university research institutes – 35%. Only 7% of scientists are under 36 years of age (Ministry of Education and Science RL, 2009). Obviously, graduates are greatly interested in academic career. The report also noted a research by the Survey of Innovative Businesses in Latvia (SIBiL), Stockholm School of Economics and TeliaSonera Institute that aimed at analysing the factors influencing the innovative activity determinants of the small business. The results of the research question the fact that higher education has long-term positive impact on Latvian business innovation and thus is economic development factor.

The solution of the problem essentially at it roots through the reform of higher education system will most likely cause a large academic and public sector resistance. The participants of abovementioned roundtable debate concluded that the pressure for reform can only be a government`s and society`s initiative requiring the universities on the taxpayers' money to introduce more severe quality standards. In order to do this, it is necessary to change the financing system of higher education. The current system is primarily subjected to so-called "budget places" funding, which is a form

of industrial policy in higher education having government to subsidies specific science sectors, while the spending on research largely depends on the performance indicators and, following the old traditions mainly 'research institutes' are financed.

Latvian R&D funding and the intensity (percentage of GDP) is dramatically low, one of the lowest in the European Union – both from public sources and from industry. Additional funding from the EU structural funds does not improve the situation significantly. Even if we followed the example of Swedish Statistical Bureau and included also doctoral studies money in science funding, Latvia would still remain in one of the last places in the EU rank of R&D funding intensity.

Considering the perspectives of knowledge economy in Latvia, World Banks experts at one of the official visits to Latvia were quite sceptic: ...a country should achieve a certain level of R&D spending in order to become a recognized field player in knowledge economy – the " 'participation fee' is high enough" (Feghali, 2003). It is estimated that regarding the funding of R&D Latvia spends about 7600 times less than the US and around 180 times less than Finland. The Czech R&D expenses are approximately 20 times more than in Latvia. Calculating R&D funding per capita, in Latvia it is five to 90 times less than in other parts of the civilized world. "We first recommend to address structural changes, then the institutional infrastructure building, and finally the realization of various grant plans," – was another opinion expressed by World Bank experts on R&D funding in Latvia, i.e., funding for R&D may be granted only after a structural system and changes are designed and implemented.

Eight US North-Eastern universities, which are the richest in terms of traditions and financial support, among them Harvard (founded in 1636), Yale (1701), Princeton (1746), formed the Ivy League in 1954, which is an elitist club of the most influential universities in America. Each of the league`s institution of higher education receives billions of US dollars per year as donations, Yale – around 11 billion USD. In the advertisement materials of other schools of higher education one can often find the phrase that these schools of higher education are as good as the members of Ivy League.

Yet in 2002 the EU's development strategy required for all Member States to invest 3% of GDP in R&D development, including 1% from the state budget allocations, but 2% private sources (European Commission, 2002). It was not surprising that such an approach gained wide support for the European scientific community and governments begun to think about the implementation of plans (European Commission, 2003). Even considering the possibility to adjust the goals and maybe becoming just as competitive rather than the most competitive region in the world, 3% of GDP investment in R&D development was kept as one of the main Lisbon strategy performance indicators. By meeting this goal the Member States were promised to receive a recognition and forthcoming in other EU policies, but for failure – a collective criticism and avoidance (Kok, 2004). Only few of EU Member States met the 3% target in the framework of Lisbon strategy, but the majority did not fulfil their promises, because of the financial crisis, economic downturn

and other reasons. The same objective about 3% in R&D investment is included in EU2020 strategy that was approved in 2010 hoping of successful implementation of it this time.

„The State which development will depend on new knowledge created by others, in spite of its own professional skills, will fall behind in production and will not be able to compete in global markets" (Zachary, 1999, p.463) – the quote about the sources of economic development from thoughts by Vannever Bush when he was preparing R&D policy guidelines for US after the Second World War. However, Liechtenstein, unlike the US, does not create new knowledge, but the money turnover in Liechtenstein keeps them the title of the richest country in the world by GDP per capita.

Latvia will not be able to resemble neither the US nor Liechtenstein. We also cannot show off in the world with our ability to create new knowledge. Although the total number of scientific articles is not that low in Latvia,[2] especially when taking into account the poor funding in Latvian R&D, still Latvian addresses under the articles of *Nature, Science* or other highly ranking scientific journals can be counted of the fingers of one hand. If, however, it happens to catch one, you will see that the corresponding, i.e. main authors are not coming from Latvia.

Despite the propitious economic development theories for science, the image of most powerful scientist in times of Vannever Bush – the driving force of progress, who wins wars, kills insects and launches „the green revolution" – is vanishing slowly. The gap between science and society today itself already serves as a scientific research object. After regaining the independence the opposite views of Latvian society and science have been supplemented with new dimensions of national confusions (Tisenkopfs, 2002, pp.80-86):

1) the low level of science funding has not hindered the current emergence of economic revival process, where the results of local scientists and science in general in fact have not played any part.
2) in the period of 1990 - 1995, while the Latvian GDP fell twice as low, the number of employees in science dropped more than six times and then stabilized at this low level. Employees who left from science and went into business, public administration or politics, apparently suspected by their former colleagues in science that they simply are not enough entrepreneurial or capable of doing something more profitable.
3) the Latvian society, science and public do not have a common dialogue. Scientists have no real impact on the social processes. State receives academically correct and sometimes even comic complaints about the low funding from rapidly aging scientific research environment, and replies promising using principle "How can we not promise." Development is replaced by rituals, the modernization of structures – with the change of titles. Keeping academically and politically correct face, some are considered to be cheaters, others – parasites.

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[2] See also RIS-Latvija Pētījumi, „Reģionālās inovāciju stratēģijas informatīvais izdevums Nr.6" (Regional Innovation Strategy. Volume No.6).

Foreign direct investment (FDI) in the mid-nineties reanimated the national economy after it had fallen deeply because of de-industrialization and banking crisis, and mainly (~ 85%) was used in transport, financial and commercial sectors, as well as for labour, but not for knowledge-intensive manufacturing industries. Knowledge-intensive industries (excluding telecommunications) received only 3% of the amount of FDI and education – only 0.1% (Vatkins and Agapitova). Latvian exports in 2010 is dominated by wood (19%), industry – electricity and heating (20%), wood manufacturing (17%) and food manufacturing (15%) (Central Statistical Bureau of Latvia, 2010), while the high-tech products account for only about 5% and this indicator has not changed substantially in recent years. A small and medium enterprise in „old Europe" and the US is the main phase of commercializing R&D results and attracting of private investments for research. In Latvia small and medium enterprises in majority of cases are technologically and financially too weak to actively participate in development of high-tech products [3] (Dimza, 2003, pp.198).

Conclusion: the rapid growth of small-scale economy based only on cheap labour and services cannot continue indefinitely. With one of the lowest GDP level in the EU and one of the lowest shares of investment in R&D Latvian knowledge-based economy is not to be created. Local companies are also too weak to seriously invest in R&D. Latvian private sector investments in R&D development in comparison to EU's criteria are even more lower (~ 12,5 times) than the government grants (approximately 5 times lower).

It is to be considered that the rapid and large increase in Latvian science funding can be dangerous - as dangerous as too much food for starving people. One may agree with the conclusions that scientific institutions of the new EU Member States already have problems with the efficient use of resources - "absorption" (European Commission, DG Research and Technological Development, 2003). We fail in usage of the available funding, and there are no clear plans on where to spend and how to use the next millions available in upcoming years. When planning the knowledge economy, a clear vision at the national level is needed of how to use the money from state budget contribution so that it creates twice as high R&D investment flow from businesses in order to contribute to the stable growth of GDP?

R&D investment outcome analyses of the three year period in OECD countries show that research investments in public sector is more advantageous than in private sector (Guellec and Van Pottelsberghe, 2003). Such a seemingly unexpected finding can be explained by the fact that public sector researches can be used in a wider range and can have better access by the larger possible number of users. Researches of the private sector companies are mostly carried out in very narrowly specialized areas and they rarely can be used for other users or purposes, as a result the returned values or outcomes of these researches in the medium and long term periods are significantly reduced. At the same time, public and private sector jointly funded R&D

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[3] See also RIS-Latvija Pētījumi, „Reģionālās inovāciju stratēģijas informatīvais izdevums Nr.5" (Regional Innovation Strategy. Volume No.5).

have synergistic effect on GDP growth confirming that universities and public research institutions require use of a complementary business activities. Without loudly declared public initiatives in R&D contribution the echo of the business jungle should not be expected.

New knowledge was, is and will be the main product of science. To make the new knowledge a wealth, the national R&D funding should create a public and private sectors` institutional network. Well known American science organizer Ch. Wessner calls this network an „innovation ecosystem" (Wessner, 2004). The systems or the network`s activities produce, develop, adapt and commercialize new technologies while the political will stimulates the increase of its competitiveness, prosperity and wealth in the form of a measurable return on investment in R&D. Innovation ecosystem includes:

1) scientific activities in universities, research universities (Muiznieks, 2004, pp.482-496), government and in public or private research laboratories;
2) qualitative secondary education system that gives serious knowledge in natural sciences and mathematics to as large as possible number of graduates;
3) commercialization of knowledge and technology transfer opportunities;
4) business environment interested in developing, acquisition or use of new technologies;
5) availability of highly qualified workforce, infrastructure and financial resources;
6) effectively functioning institutional and legal provisions;
7) broad and diverse use of information technology.

In Latvia only the first "ecosystem`s" component of the list as well as the traditional support for scientific research projects and programmes are considered to be investment in R&D. Given that without normally functioning "ecosystem" one separated part of it is non-viable, it is important to be able to invest in the development of all components, as well as to set reasonable priorities, even though the most ambitious dreams of the amount of R&D development in Latvian will still be insufficient.

The study "More research for Europe" clearly proves that the main factors that companies evaluate when deciding whether and where to invest in R&D are: (1) availability of (2) qualified researchers, (3) an active research environment with (4) visible scientific achievements (5) a favourable system of legal acts as well as (6) the financial conditions (European Commission, 2003). It is clear that these are not a small technology business start-ups, but serious, internationally operative companies. Venture capital fundraising firstly needs professional management, a solid idea, high-quality business plan. Most of the new EU Member States recognizes the lack of young scientists and infrastructure as the main factors impeding the development (European Commission, DG Research and Technological Development, 2003).

It is not possible to cultivate all components of the ecosystem simultaneously and equally intense. Therefore, in my opinion, the first task to be solved

immediately, because it is crucial for all further work and it requires the longest time, is a specialist training programme – starting from secondary school and ending at the doctoral level meanwhile developing the necessary infrastructure for this purpose. The rest of the "ecosystem`s" components, at least in the first phase of development will not require too much money and can be created relatively quickly.

In both Europe and North America the main beneficiaries of state budget funding of R&D are universities and public research institutions (laboratories, institutes, centres, etc.). A part of public funding also goes to researches carried out by the private companies.

Both the EU and the US remaining on average constant state budget investment in R&D, there is a tendency to redistribute resources in favour of universities. GDP growth is faster in countries where a relatively larger share of researches is carried out in universities rather than public research laboratories. Economic analysis clearly shows that in long-term it is profitable to invest public funds in universities R&D (Clarke, Ch., Secretary of State for Education and Skills by Command of Her Majesty, 2003) (Guellec, and van Pottelsberghe, 2001/11, pp.103-126). The operative results of researches in national laboratories are often significant, but economically hard to assess (military and political problems, health and environmental protection). National research institutes of EU's "old Member States" are mainly operating in fields of nuclear energy, agricultural resources, construction, health and military. In recent years there is a growing trend in the commercializing of public research institutions work or outsourcing their functions to private capital (European Commission, 2003, p.65-74).

Unfortunately, the awareness about the role of higher education and science in national development strategy of our political environment does not come "from the heart". It comes rather from indicative guidelines and documents that Latvia as EU Member State cannot ignore. Generous contribution of EU Structural Funds for science and higher education is actually not our initiative, but the creditors` requirement. The Action Plan "More Research for Europe" supports the scientific activity as a priority for EU Structural Funds period of 2006-2013, but the European Commission 3rd Cohesion report that defines the EU regional development policy guidelines, approves this priority and obliges Member States to support it financially in the planning of structural funds (European Union Research Advisory Board, 2004).

4. Possible Solutions

The lack of scientific doctoral degree holders is a painful issue also in "old Europe" – EU15. Applying the estimates of the additionally required 700 thousand doctoral degree holders in Europe (Gago, 2004) on Latvian population, a result of at least 3500 new scientists would appear. Of course, this task which was highlighted in EU guidelines in 2002 we cannot achieve anymore and, to be honest, Latvia has still a long way to go towards it. During the last three years there are a little over 400 doctoral graduates in Latvia: in 2010 – 132 graduates, 2009 – 174, and in 2008 – 139 people obtained

doctoral degree. The total amount of students in Latvia is not that low – in 2010 there were more than 26`000 university graduates, however the share of those actually obtaining master and doctoral degrees is accordingly only 18% (master degree) and a very low number of 1% for doctoral degree out of all graduates (Ministry of Education and Science RL, 2008; 2009; 2010).

In order to make efficient use of R&D funding from the state budget and create preconditions for private R&D capital inflow the first task for universities is to restore and supplement the number of scientific personnel. To ensure the existence of Latvian academy by reproducing doctoral graduates, Latvia needs at least 100–120 new doctoral degree holders every year. But the precondition for growth is 300 new doctoral degree holders every year, which could be actually achieved in nearest years by straining the energy and all strengths, and then probably in another 6-10 years, using the accumulated inertia, move on to preparing 600–700 new doctoral degree holders a year.

Such a significant growth of doctoral graduates in short period of time, of course, is not an easy task, especially when keeping high standards for degree recipients. Doctoral studies funding should be increased 3-4 times. Insufficient funding (together with lack of motivation) is one of the main reasons for low scientific efficiency in Latvia. Stingy pays twice – in case of doctoral studies even ten times more. From the perspective of budget formation, in the higher education funding section, similarly as in Sweden[4] doctoral studies can be separated and R&D funding can be redirected to them. The freed resources in higher education budget, in its turn, should be reallocated to strengthen the master study programmes – from where else there will be next doctoral students.

It is clear that the lack of doctors in our universities will be difficult to deal with on their own. To grow the number of doctoral degree holders in the nearest years up to 300 people per year, the following actions should be taken:

1) to create a financial support system that allows some part of the doctoral study programme accomplish abroad or outside the university – institutes, agencies and companies, which have the necessary material and technical supply and where can be made not only routine analysis, but also research tasks;
2) to establish doctoral schools and methodological, teaching seminars with the participation of professors from partner universities who advise students and supervise doctoral study progress in one or another field of science or even in group of science fields;
3) to organize doctoral programmes with emphasis on full-time studies, providing scholarships and study quality monitoring system, thus contributing to a focused and intense work;
4) to motivate achieving of doctoral degree through the academic career system and business environment in which scientific qualifications

[4] Netherlands Bureau for Economic Policy Analysis (CPB) and Centre for Higher Education Policy Studies (CHEPS). Higher Education Reform: Getting the Incentives Right, Netherlands. Available at: http://doc.utwente.nl/37703/1/bijz29.pdf

are properly rewarded – so increase wages of scientists already now aligning them with the wages of the university academic staff in according category.

Harmonious approach should be maintained in development of different fields of science, i.e., when increasing the number of doctoral graduates in natural sciences, the amount of graduates in humanities and social science fields should also be increased. One cannot hope for success in technologies without properly skilled management, marketing, interaction with society, protection of intellectual property and customer rights, and awareness of culture and traditions. Only approximately 30% of success in technology commercialization is created by technology itself – the rest is good business plan and its management.

Effective doctoral studies require an appropriate scientific infrastructure. It is not only large and expensive scientific equipment for the natural, medical and engineering policies, the need for which, after nearly 20 years of use of "second-hand", at least to some extent will be met through the EU Regional Development Fund. Doctoral programme requires a mix of infrastructure elements and equipment: laboratories for simple routine works, libraries and databases, high-speed Internet access, softwares, hardware, as well as technical advice and support to all of these resources. Universities` potential in usage of the infrastructure can be more effective than anywhere else – academia will not suffer from shortage of users and work with the infrastructure will be more diverse and intense than in small narrowly specialized laboratories.

Analytical and data processing centres can be used not only for fulfilment of doctoral studies, but they can also support scientific activities in general, replacing the similar services that are expensive or technically difficult to access outside Latvia, and thus providing the opportunities to:

1) intensive research work in several directions of scientific work using large-scale expensive scientific equipment;
2) deal with large data arrays resulting from results of different studies with the most efficient and secure methods;
3) to consult and train the researchers from different institutions to work with hardware, thus increasing the qualifications of Centre's own staff;
4) to ensure regular maintenance and consumables for use of the equipment and implementation of research processes.

Moreover, we should stop complaining about the brain drain and mourn the loss of colleagues who are leaving to work abroad. Instead, we should invite them back, attract new talents and experts and maybe even a recognized well-known "*stars*" from other countries. This approach will also require different grant schemes – support for return emigration from abroad or from the business environment, development offer for science departments (the Canadian model)[5] to develop new perspective

[5] University Act R.S.B.C. 1996. c.468, Consolidated as for 27 April, 2007. Available at: http://universitycounsel.ubc.ca/files/2011/05/University_Act_20110427.pdf

directions. Science departments could be built in those science fields that can attract internationally recognized experts to work for the University or in close cooperation with it, or to encourage the return emigration of Latvian scientists from abroad or from non-academic activities. The science department project duration would be maximum five years, during which it should achieved academic and financial maturity.

The establishment of science departments should be achievable at any research perspective, including those already approved by university or still to be created. I think it would be dangerous to strictly set the scientific priorities and focus all the forces only on them. Priorities, of course, should be set, but in addition a place of "little science" must be left. The proportion of funding could be about 2:1 or 3:1. 60–70% of the support amount for research programmes is received by limited number of priorities, which are coordinated with other research institutions outside the university. They will mostly likely be concentrated at easily predictable and highly competitive industries (which countries don`t have IT, biotechnology and nanotechnology as their priorities?) (Hackmann and Rip, 1999), where you can expect both a large number of scientific publications with a relatively predictable content, and the harsh struggle for a market niche. Approximately 30% of academic R&D funding, I think would be appropriate to use for development of science departments (about 100 thousand lats per year, up to five years), for small groups – about 30 thousand lats per year and for subjects of individual initiatives – about 10 thousand lats per year. The task of science departments, on the one hand, would be to ensure that all the study programmes at the university are supplemented by scientific research. On the other hand, it may be possible that far away from the highways of scientific priorities somewhere on the small paths one might find the "big prize," a new paradigm (Kuhn, 2000, p.210). Of course, the "small science" projects can be undertaken only if there is sufficiently developed jointly used base of analytical and data-processing infrastructure.

With regard to the scientific projects, all types of project applications should include impartial expertise about project financing and implementation. The expertize might not be directly from the same field of science as the project application; it would be enough if the experts were specialized in sub-field or related sub-field of science. The narrower field of expert knowledge is required, the harder it will go with original ideas (Chargraff, 1980). Few success stories of Latvian scientists` participation in attraction of R&D investment for foreign companies show that large international companies can be interested in: 1) opportunity to get qualified cheap service - "fix your teeth," 2) use of a unique infrastructure – "*hunt*," 3) obtaining of a prior rights to use the new knowledge and skills – "*to purchase land*." The first type of interest is likely to gradually diminish and will move towards East, when our cost of living and required reward will increase. The second type of resources are very heterogeneous: potentially dangerous chemical baths, less strict rules and implementation control requirements than in other parts of EU, the radio-telescope, a painfully pulsating bi-communal society in socio-economic transition, unharmed nature saved from impact of economic

activity and so on. Hopefully both scientific and political environment will be reasonable enough to maintain and preserve these resources where possible, similarly as it is done with unique historical monuments. The third type of investment is the most prestigious and advantageous because it facilitates international recognition and the stable attraction of the biggest investments, however it is also the most difficult to implement; because it is the same with the findings as it is with bees – they cannot be predicted and scheduled. Nevertheless, academic freedom, diversity in researches and intensive movement of people is such a "honey" that no national research programme can be alike. Of course, it is not easy to balance the workload of regulated normative work with research in magneto-hydrodynamics or design of artificial virus-alike particles, but it is still an achievable task.

To promote academic development and multi-disciplinary research University of Latvia has successfully started to implement the idea of doctoral schools (DS). DS are long-term (4-12 years) projects to implement multi-disciplinary, topic-oriented doctoral and master studies. The main objective of DS is to improve the quality and effectiveness of doctoral studies by organizing multi-disciplinary studies, increasing their internationalization and ensuring the University`s doctoral student involvement in the international academic course through grants for doctoral and master studies, including the European Social Fund for doctoral and master studies development project.

Main tasks of DS are to combine various fields of science, academic and research work for solving scientifically and socially important issues; to promote exchange of information and ideas, including formation of innovative projects by encouraging the use of doctoral studies` results throughout the innovation process; to attract foreign partners in doctoral studies as well as experts from the social partner institutions; to promote publishing of research results in international scientific periodicals.

Latvian University doctoral schools are established to operate in a four-year period with the possibility to prolong their activity two times on the basis of repeated application followed by positive decision from Academic Advisory Council of the University and the University leadership support.

DS is established on the basis of the University academic staff members or departments (faculties, research institutes, units) application. To establish the DS applicant needs to have or ensure: 1) participation of at least three different doctoral programmes from two different fields of science, 2) three letters of support from institutions involved in DS, 3) DS Executive Board, which consists of at least 10 scientists (50% of which must be from University staff, at least 3 board members must be scholars attracted from abroad and at least two members must be from the Latvia, but not University staff). It is stated that there must be at least one dissertation supervised (with doctoral degree obtained as a result) on average per one Executive Board member of the University over the past three years.

While reviewing the application of DS establishment, advisory councils of the University consider the following criteria: scientific and practical significance of the DS subject, novelty and multi-disciplinarity, cooperation potential, the possible value added that might result from collaboration,

as well as qualifications of DS Executive Board. After the DS application is reviewed advisory council makes recommendations to University leadership, which creates the commission that evaluates the DS conformity with the development strategy of the University, realization opportunities, as well as conformity with interests of social partners and the University image. Necessary documents for creation of DS include application, action plan, the application`s evaluation form, letters of support, the list of members with attached CVs and proofs of participation, as well as the list of doctoral thesis defended under the supervision of University`s academic staff included in Executive Board.

The participants of DS are master and doctoral students, their academic supervisors, DS Executive Board, including its chairman and technical secretary. DS work is organized in scientific colloquies, seminars, methodological trainings and other related activities. DS activities are organized to improve the scientific performance of its participants, analyses of scientific theories, learning of scientific methods, identification of innovation and knowledge transfer opportunities, publishing opportunities of research results and other. DS Executive Board decides upon cooperation with study programmes, DS scientific directions, involvement of new participants and partner institutions for researches the main subject of DS, and upon other questions.

5. Conclusion

Approximately in the middle of 1990's, when the main purpose of Latvian economic programme was rehabilitation of market economy, elsewhere in the civilized world a confidence grew strong that the classical model of capitalism is at its end and the new knowledge economy and knowledge society would soon take its place. As it turned out, by joining EU and NATO we, however, have not reached our purpose, but only joined a large convoy on its route to the next horizon – post-capitalism knowledge society with education and information as a key resource for development (Karnitis, 2004, pp.208).

Latvian national development plans and top-level national strategic documents, taking examples from the EU, which not very successfully, but decidedly is trying to keep up with development trend in North America and Asia, have chosen the right words of faith statement for the knowledge society: knowledge economy, knowledge-intensive use, competitive higher education, complementary development of higher education, research and science-production (Cabinet of Ministers RL, 2006). Are these words sustained with a real understanding approved by responsible actions? In other words, are the declared priorities also reflected in the budget lines?

Still, knowledge dissemination and promotion, technology transfer, joint infrastructure development and large-scale scientific equipment purchase will mainly be funded by EU structural funds. European Commission documents remind the new Member States of the need to develop R&D provision.

The main task of universities, in order to make efficient use of R&D funding from the state budget and create conditions for private capital inflow of R&D,

is to restore and supplement the number of scientific personnel. The available EU financial support and the implementation of doctoral schools seem to be giving promising circumstances to start to reproduce doctoral graduates necessary for ensuring the academic environment in Latvia. Latvia needs at least 100-120 doctoral graduates a year, the precondition for growth is 300 new doctoral degree holders every year, which could be actually achieved in nearest years by straining the energy and all strengths, and then probably in another 6-10 years, using the accumulated inertia, move on to preparing 600–700 new doctoral degree holders a year.

There is no evil without good. Forest fires free space for coppice. War damage once forced Germany and Japan radically modernize their industries and for some time to become the fastest growing economies in the world. Structural changes in Latvian science in the first half of nineties can be compared with the bomb blast, which destroyed more than 80% of the scientific staff. The harshest phase in transformation of Latvian economy was almost 20 years ago. Economy did overcome it, but the scientific field is still as if affected by the frost. Young sprouts are to be cultivated otherwise life will not grow greener.

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3.

Interdisciplinarity in Academic and Non-academic Settings: Methods and Models

Alexandre Berlin

Interdisciplinarity as an Increasingly Implied and Applied Concept*

Abstract

Interdisciplinarity is becoming an accepted concept in many areas of human endeavour. The gradual and slow implementation of this concept, though a holistic and integrated approach, in two areas of crucial importance for populations, health and education is examined in this article.

While the "Health in All Policies (HiAP)" concept, by excellence an interdisciplinary approach, and the urgent need for its implementation is now widely recognized, its real implementation at all levels of government is lagging behind.

The other area of human importance is that of education, in particular higher education. With the growing interaction between the traditional disciplines based structures of universities are facing already for several decades the need of reform

The case of the European Union studies is examined, together with the implementation of non traditional approaches such as the use of non-academic settings to bring the EU reality closer to the students, through study tours and internship programmes, and the need for an enhanced involvement of the European institutions in the framework of the Erasmus programme.

Keywords: health and education, non-academic settings, holistic and integrated approach.

1. Introduction

Interdisciplinarity is becoming slowly an accepted and increasingly applied concept in many areas of human endeavour. It is a most valuable tool in decision-making process and for analyzing different policy options.

During the last decades, interdisciplinary thinking has moved up on the policies agenda in the EU and other international organizations (OECD, World Bank) as well as in many advanced knowledge societies.

While the importance of interactions between governmental policies is recognized, it is not always fully implemented in practice in most countries resulting frequently in incoherent policies. There is in particular the need to encourage a greater "knowledge exchange and interaction" between all parties concerned, including public authorities, research and teaching institutions, NGOs, and opinion makers.

* Very special thanks are due to Professor Eduard Lavalle, Capilano University and Dr. Donald Sparling, Central European Association of Canadian Studies with whom the Study Tours to the EU and Canada, referred to in this paper, have been conceived, organized and carried out.

Two areas of crucial importance for populations, health and education have recognized the fundamental importance of this concept of interdisciplinarity and are attempting to increasingly implement it though a holistic and integrated approach. These two areas are discussed in detail with a number of very specific and practical examples.

2. Interdisciplinary Implications for Health

Health is "priceless"; achieving and maintaining the best health possible for individuals and the population is both costly and requires a considerable workforce. It is however increasingly recognized that health is a major contributor to the "wealth" of nations; health is also increasingly seen as a strong predictor of economic growth.

2.1. Health and economic development

In November 2005 Council of Europe Development Bank, the Council of Europe, the WHO Regional Office for Europe and the South-eastern Europe Health Network (SEEHN), organized in Skopje (The Former Yugoslav Republic of Macedonia) the Second Ministerial Health Forum with the special participation of ministers of finance on "Health and Economic Development in South-eastern Europe."[1]

One of the key objectives of the Forum was to demonstrate the economic potential of health as a way of increasing productivity and decreasing public expenditure on illness: a healthy population works better and produces more.

A report prepared for the Forum on "Health and Economic Development in South –Eastern Europe" (see Council of Europe Development Bank and WHO, 2006) examined the contribution of health to economic development. The report demonstrates the economic importance of health for the countries of south-eastern European. Health, as a human capital ingredient, is especially relevant for sustained economic development and social cohesion. These two political objectives figure now prominently on the EU agenda and play a central role in the European Union's Lisbon agenda.

This report was the first comprehensive step in assessing the economic impact of adult ill health in south-eastern Europe, and the findings clearly indicate that: ill health has negatively affected individual and household economic outcomes in several countries for which data were available, and a sustained reduction in the adult disease burden would produce substantial economic benefits for the economies of all the countries considered. These insights are consistent with evidence in other countries. Together they add value to previous studies of other countries that largely confined their economic impact assessment of health to issues around infectious disease or child and maternal health conditions – diseases that characterize developing countries and may have limited relevance to European countries. Some might have thought that diseases that allegedly strike the individual at a later stage in life would have

[1] In which I participated actively as a Member of the SEEHN Executive Committee.

only very minor economic importance, but the these analyses show that this hypothesis does not stand up to empirical scrutiny. Adult health matters not only intrinsically, but also economically.

As the report stresses: "the policy implications are that:

- investing in adult health is a sound investment strategy likely to yield tangible economic returns, on top of the human benefits;
- policymakers interested in the economic future of South-eastern Europe (SEE) and its people would have a greater likelihood of success by incorporating health into their portfolio of investment strategies (there may be a particular case for the EU to consider health investment as a key area of its pre-accession policy as well as its wider European neighbourhood policy); and
- given the magnitude of economic benefits that can be expected from improving adult health in SEE countries, any reasonable and well-designed increase in the resources devoted to health, both within and outside the health system, would produce a significant economic return."

The overarching message from the findings is unambiguous: poor adult health negatively affects economic well-being at the individual and household level in several SEE countries for which data were available; if effective action were taken, improved health would play an important role in promoting sustained economic growth in those countries.

Dr. Marc Danzon, WHO Regional Director for Europe[2] stressed that "Investing in health – through the health systems and through non-health sectors – is an integral part of the overall strategy to achieve sustained economic growth and poverty reduction,"

The Skopje Pledge adopted by the Ministers, they "recognize that health, as an integral determinant of social cohesion, is an investment and a major factor in development, is essential to lasting peace, stability and economic progress."

2.2. Health for All

In recent years it has become generally recognized that health is a much more complex concept than the absence of disease.

Thus in 1981, Dr. Haldan Mahler, Director General (1973-1983) of the WHO, defined the basic elements of the concept of Health For All, as follows (Mahler, 1981): "Health For All means that health is to be brought within reach of everyone in a given country. And by "health" is meant a personal state of well being, not just the availability of health services – a state of health that enables a person to lead a socially and economically productive life. Health For All implies the removal of the obstacles to health – that is to say, the elimination of malnutrition, ignorance, contaminated drinking water,

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[2] Presentation by Dr. Danzon at the 2nd Health Minister's Forum of South-eastern Europe (Skopje 2006) – "Now is the time for investment in health - A healthy community is a wealthy community".

and unhygienic housing – quite as much as it does the solution of lack of doctors, hospital beds, drugs and vaccines."

Furthermore he stressed in particular that:

- "Health For All means that health should be regarded as an objective of economic development and not merely as one of the means of attaining it;
- Health For All demands, ultimately, literacy for all. Until this becomes reality it demands at least the beginning of an understanding of what health means for every individual;
- Health For All is thus a holistic concept calling for efforts in agriculture, industry, education, housing, and communication, just as much as in medicine and public health. Medical care alone cannot bring health in hovels. Health for such people requires a whole new way of life and fresh opportunities to provide themselves with a higher standard of living."

The adoption of Health For All by governments implies a commitment to promote the advancement of all citizens on a broad front of development and a resolution to encourage the individual citizen to achieve a higher quality of life. The rate of progress will depend on the political will.

Two decades later, WHO Director General Jong-wook Lee (2003–2006) reaffirmed this concept in the World Health Report 2003. Health for all became the slogan for a movement." It was not just an ideal but an organizing principle: everybody needs and is entitled to the highest possible standard of health. The principles remain indispensable for a coherent vision of global health. Turning that vision into reality calls for clarity both on the possibilities and on the obstacles that have slowed and in some cases reversed progress towards meeting the health needs of all people. We have a real opportunity now to make progress that will mean longer, healthier lives for millions of people, turn despair into realistic hope, and lay the foundations for improved health for generations to come" (WHO, 2003).

2.3. Health in All Policies

As a follow-up a new concept emerged that of "Health in All Policies (HiAP)", Ilona Kickbusch[3] in 2007 defined it "as innovative policy strategy that responds to the critical role that health plays in the economies and social life of 21st century societies. It introduces better health (improved population health outcomes) and closing the health gap as a shared goal across all parts of government and addresses complex health challenges through an integrated policy response across portfolio boundaries. By incorporating a concern with health impacts into the policy development process of all sectors and agencies it allows government to address the key determinants of health in a more systematic manner as well as taking into account the benefit of improved population health for the goals of other sectors. Health in All Policies is committed to the achievement of sustainability and the health and wellbeing of both present and future generations."

[3] See also: www.ilonakickbusch.com/health-in-all-policies/index.shtml

Meri Koivusala (2010) summarizes the status of HiAP as follows: "Health in All Policies (was formally legitimated as a European Union (EU) approach in 2006. It resulted from more long-term efforts to enhance action on considering health and health policy implications of other policies, as well as recognition that European-level policies affect health systems and scope for health-related regulation at national level. However, implementation of HiAP has remained a challenge. European-level efforts to use health impact assessment to benefit public health and health systems have not become strengthened by the new procedures. HiAP has at European level remained mostly as rhetoric, but legitimates health arguments and provides policy space for health articulation within EU policy-making. HiAP is a broader approach than health impact assessment and at European level requires consideration of mechanisms that recognise the nature of European policy-making, as well as extending from administrative tools to increased transparency, accountability and scope for health and health policy-related arguments within political decision-making in the EU. As a result of the Lisbon Treaty, European-level policy-making is expected to become more important in shaping national policies."

While the "Health in All Policies" concept, by excellence an interdisciplinary approach, and the urgent need for its implementation is now widely and fully recognized, its real implementation at all levels of government is unfortunately still lagging behind. A number of international conferences and intergovernmental meetings regularly reiterate the concept and the need for its implementation.

In 2010 the International Meeting on "Health in All Policies" (WHO & Government of South Australia, 2010) organized by the World Health Organization and the Government of South Australia, stressed again that:

"Health in All Policies" is an approach, which emphasises the fact that health and wellbeing are largely influenced by measures that are often managed by government sectors other than health.

HiAP seeks to highlight the connections and interactions between health and policies from other sectors. HiAP explores policy options that contribute to the goals of non-health sectors and will improve health outcomes.

By considering health impacts across all policy domains such as "Health in All Policies" works best when:

- a clear mandate makes joined-up government an imperative;
- systematic processes take account of interactions across sectors;
- mediation occurs across interests;
- accountability, transparency and participatory processes are present;
- engagement occurs with stakeholders outside of government;
- practical cross-sector initiatives build partnerships and trust. Agriculture, education, the environment, fiscal policies, housing and transport, population health can be improved and the growing economic burden of the health care system can be reduced.

The health sector's role is to support other sectors to achieve their goals in a way which also improves health and wellbeing.

Finally the "Adelaide Statement" gave, among others, the following practical examples of joined-up government action (cf. Table 1).

Table 1. Joined-up government action practical examples

Sectors and issues	Interrelationships between health and well-being
Economy & employment	Economic resilience and growth is stimulated by a healthy population. Healthier people can increase their household savings, are more productive at work, can adapt more easily to work changes, and can remain working for longer. Work and stable employment opportunities improve health for all people across different social groups.
Security & justice	Rates of violence, ill -health and injury increase in populations whose access to food, water, housing, work opportunities, and an air justice system is poorer. As a result, justice systems within societies have to deal with the consequences o poor access to these basic needs. The prevalence of mental illness (and associated drug & alcohol problems) is associated with violence, crime and imprisonment.
Education & early life	Poor health of children or family members impedes educational attainment, reducing educational potential and abilities to solve life challenges and pursue opportunities in life. Poor health of children or family members impedes educational attainment, reducing educational potential and abilities to solve life challenges and pursue opportunities in life. Educational attainment for both women and men directly contributes to better health and the ability to participate fully in a productive society, and creates engaged citizens.
Agriculture & food	Food security and safety are enhanced by consideration of health in food production, manufacturing, marketing and distribution through promoting consumer confidence and ensuring more sustainable agricultural practices. Healthy food is critical to people's health and good food and security practices help to reduce animal-to-human disease transmission, and are supportive of farming practices with positive impacts on the health of farm workers and rural communities.
Infrastructure, planning & transport	Optimal planning for roads, transport an d housing requires the consideration of health impacts as this can reduce environmentally costly emissions, and improve the capacity of transport networks and their efficiency with moving people, goods and services. Better transport opportunities, including cycling and walking opportunities, build safer and more liveable communities, and reduce environmental degradation, enhancing health.
Environments & sustainability	Optimizing the use of natural resources and promoting sustainability can be best achieved through policies that influence population consumption patterns, which can also enhance human health. Globally, a quarter of all preventable illnesses are the result of the environmental conditions in which people live.
Housing & community	Housing design and infrastructure planning that take services account of health and well- being (e.g. insulation, ventilation, public spaces, refuse removal, etc.) and involve the community can improve social cohesion and support for development projects. Well-designed, accessible housing and adequate community services address some of the most fundamental determinants of health for disadvantaged individuals and communities.

Even more recently, the third Health Ministers' Forum (with the special participation of SEE policy-makers from other government sectors) on Health in All Policies in South-eastern Europe: a shared goal and responsibility,

Banja-Luka (B&H), 12-14 October 2011[4] adopted the Banja Luka Pledge, by which the Ministers unanimously resolved to work towards "achieving equity and accountability in health by:

- Committing our Governments to advance the goals of Health in All Policies (HiAP) within our countries, across the SEE Health Network and in the European Region,
- Advancing the implementation of the HIAP approach to ensuring that health and health equity are considered in all policy and investment decisions at local and national level,
- Strengthening the routine mechanisms that engage local communities, NGOs and other stakeholders as partners in identifying solutions for improving health and reducing health inequalities,
- Strengthening capacity and technical cooperation in implementing Health and Health Equity in all Policies,
- Supporting and facilitating development of strong high-level policy processes across the different sectors for dealing with the social determinants of health and implementing the HiAP approach in all member states."

2.4. Health in All Policies – an example – traffic accidents

Finally a striking example of the impact of other policies on health is afforded by the health consequences due to traffic accidents. In the introduction to the world report on "Road Traffic Injury Prevention" prepared under the auspices of the World Health Organization and the World Bank (Peden et al. (ed.), 2004) it is stated that "Road traffic injuries are a major but neglected public health challenge that requires concerted efforts for effective and sustainable prevention. Of all the systems with which people have to deal every day, road traffic systems are the most complex and the most dangerous."

There are a large number of data basis concerning traffic accidents based on official country data, the best example being the one published by the Economic Commission for Europe in 2011.[5]

The Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "Towards a European road safety area: policy orientations on road safety 2011-2020" summarizes the situation in the European Union as follow: "Road safety is a major societal issue. In 2009, more than 35,000 people died on the roads of the European Union, i.e. the equivalent of a medium town, and no fewer than 1,500,000 persons were injured. The cost for society is huge, representing approximately 130 billion Euros in 2009 (based on the value of a statistical life calculated by the HEATCO study (6th Framework Programme for Research and Technological Development))."

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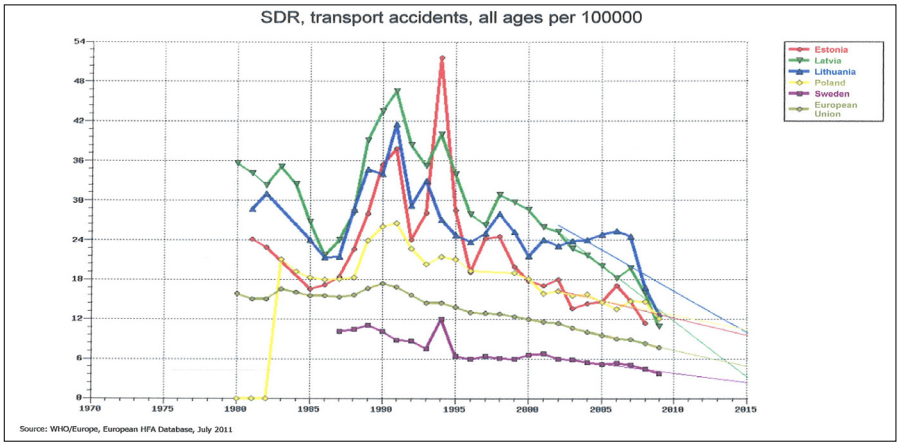
[4] In which I actively participated and was the rapporteur.

[5] "Statistics of road traffic accidents in Europe and North America Vol. LII 2011" published by the Economic Commission for Europe in Geneva.

The report on the Social and Economic consequences of road traffic injury in Europe published by the European Transport and Safety Council (see European Transport and Safety Council, 2007) considers that "the Official (police-reported) road accident statistics are incomplete, inaccurate and biased". The report quoting a review dealing with transport accident costs and the value of transport safety (ETSC 1997). The European Transport Safety Council having developed estimates for the true number of injured road users in the European Union as of 1995 (15 member states), shows "that the reported number of injuries, including deaths, in 1995 was 1,580,000, whilst the estimated true number was 3,500,000. Injured road users included all road users who sought medical treatment for an injury" (a staggering number, more than double the numbers estimated by the European Commission (see above)).

Even with the lower estimates of traffic injuries in the European Union, the European Commission stresses the absolute need for "An integrated approach to road safety: The future road safety policy (the main objective of a road safety policy is the reduction of accidents leading to death and injuries) should be taken into account in other policy fields of the EU, and it should take the objectives of these other policies into account. Road safety has close links with policies on energy, environment, employment, education, youth, public health, research, innovation and technology, justice, insurance, trade and foreign affairs, among others."



Graph 1. SDR, transport accident, all ages per 100000

The graph 1, based on WHO data, shows the standardized death rates (SDR) due to transport accidents of the 3 Baltic States, Poland, Sweden and the European Union. While the SDR have decreased everywhere in the past two decades, they are still significantly higher in the Baltic States and Poland, as compared to the EU average (70%) and in particular with Sweden (over 100%), and this despite somewhat lower traffic densities. It should be also remembered that part of the reduction of traffic deaths is due to the rapid

and improved medical attention provided in case of accidents, resulting however possibly in an increased number of "serious impairments."

It is necessary to stress again and again that transport, law enforcement, infrastructure, education and health (including emergency services) policies working together can have still a very significant beneficial impact on reducing mortality as well as health and economic (work disability) costs related to injuries (in general there are about 10 injuries for each traffic death).

2.5. Additional health related educational considerations

One of the impediments for the rapid implementation of the "Health in all Policies" is linked to the educational training of both health professionals and professionals from other disciplines with whom they must interact, for the HIAP to become an effective reality. Health professionals at all levels, and not only those few involved in public health, and the other professionals, in fields such as education, public administration, economics, territorial planning and cohesion, architecture, etc. must be exposed to each other's needs have to a good understanding of the issues involved. Teaching programmes should be adapted to that effect.

3. Interdisciplinary Implications for Education

The other area of human endeavour facing already for several decades the need of reform is that of education, in particular higher education, with the growing interaction between the traditional disciplines based structures of universities.

Interdisciplinarity was highlighted in the Financial Times in November 2011.[6] In the article "Learning the Law Business", for David Allen, dean of the faculty of business, economics and law at Surrey University, there is a clear interdependency, particularly in areas such as sustainability, regulation, governance, corporate social responsibility and ethics. At Surrey, Professor Allen is looking to hire professors and lecturers who work in an interdisciplinary way; the university will consider favourably collaborative research when research funding is allocated. At York University in Canada, Professor Puri has taken a further step, launching a scheme for cash payments for research conducted jointly by professors from the two schools (business and economics). The article "A marriage of convenience" by Adam Palin stresses that "schools reject silo mentality of the past", describing the initiative of the University of Chicago at the heart of which is the Institute of Law and Economics, which brings together 14 faculty members with the aim of being the catalyst for strengthened interdisciplinary research between the laws school, the department of economics and the university's Booth School of Business. Among the five economists participating in the institute, two – Gary Becker and Ronald Cause – are Nobel Prize winners.

There is thus clearly a growing demand for cross linkages between disciplines, and the need to facilitate exposure of students to different disciplines in an

[6] Innovative Law Schools (2011), *Financial Times Supplement*, 28 November 2011.

inter-linked structured approach. One might also consider that this concept be applied much earlier in the educational system.

3.1. Interdisciplinarity a crucial element of European Studies

European Union studies represent one such inter-linked area, by the very nature of the object to be studied: the European Union.

EU studies need to encompass a number of different disciplines to take into account the complex and wide ranging nature of the European Union. Such disciplines include political, international, economic, legal, social, labour, environmental and public health sciences studies just to mention the most salient ones. For these studies a well structured "interdisciplinary" approach would be essential.

The European Commission promotes actively "European Union studies" though various programmes and in particular through the designation (following a rigorous assessment process) of an increasing number of EU Centres of Excellence, Jean Monnet professorships and EU modules, not only in the European Union, but world-wide, and by organizing and/or sponsoring regularly Jean Monnet Conferences and Seminars at global and regional levels. In addition the European Commission promotes and provides support for Associations of European Studies at national, regional and global levels. These activities have generated the need to find the appropriate "academic environment" for these "European Studies" and to be able to award degrees specifically focused on them.

3.2. Field implementation of European Studies

The academic programmes that have been developed by institutions of higher learning, include, in general, short "study visits" to the European institutions to help students gain a first hand and inside practical understanding of the reality and functioning of the European Institutions.

3.2.1. "EU Study Tour and Internship Program" (for Canadian students)

Among the countries outside the European Union, Canada, with over a dozen EU Centres of Excellence, Jean Monnet Chairs and EU modules, is the country with the largest per capita numbers of such EU academic centres of interest.

For the Canadian students undertaking European studies, the "European reality" is even more distant than for European students daily exposed and often "confronted" with the European Union and its institutions.

To facilitate this inside understanding of the European Union, one such annual, three weeks, field programme "The EU Study Tour and Internship Program," has been established in 2004 and has now been in existence for the past eight years. [7]

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[7] It is organized by a consortium of over a dozen Canadian universities from across Canada through the *Network for European Studies (Canada)* and is administered by Professor Eduard Lavalle from Capilano University in British Columbia, and with Dr. Alexandre Berlin as the European director.

It has the endorsement of the European Institutions (European Parliament and Commission) and the Canadian Government. The endorsement of Commissioner Androulla Vassiliou, European Commissioner responsible for Education, Culture, Multilinguism and Youth (please see Appendix 2) represents very well the views of all the endorsements.

This programme has the special feature of being a multi-institutional non-profit university based activity.[8] However the main features of the programme may be characterized and summarized as follows:

- students for the Study Tour are selected by the participating universities and must receive academic credit for their participation in the Study Tour (the academic credit which they receive and the additional academic work which they must perform is determined by each academic institution);
- preference is given to Masters degree students, but Ph.D. candidates and very senior undergraduates are also accepted;
- three weeks in-depth Study visits, with briefings, to ensure coverage and adequate exposure to key EU and related Institutions;
- the EU Institutions (in-depth immersion) covered include – European Commission, European Parliament (including think tanks related to the European Parliament political groups), European Council, European Court of Justice, European Central Bank, European Economic and Social Committee as well as the European Statistical Office;
- briefings also take place at the Canadian Mission to the European Union, the Council of Europe, the International Organization for Migrations, the European Court of Human Rights, NATO headquarters, the German Central Bank Technical University, selected European Think Tanks, Research Institutes and Press Agencies, such as Centre for European Policy Studies, the European Trade Unions research institute, United Nations University – Centre or Regional Integration Studies and Europolitics, as well as a small selection of NGOs including PAYOKE and the European Citizens Action Service;
- the Study Tours have usually around 45 to 50 students, a maximum to be still effective, find adequate facilities within the Institutions, and a large enough group to attract high level staff from Institutions as speakers;
- the participating students have a large diversity of academic backgrounds, this has proven to be an important asset, enriching considerably the interactions between the participants and the speakers;
- a number (about two thirds) of Study Tour participants take up internships following the Study Tour. They are selected in advance of the Study Tour by an Academic Committee in cooperation with the institutions receiving the interns for periods of 2 to 6 months;

[8] Extensive details of this programme by Eduard Lavalle and Alexandre Berlin under the title "Thinking Europe": A Canadian academic immersion within the European Institutions; a case study of the EU Study Tour and Internship Program (in press).

participation in the Study Tour is a prerequisite for the internships. Priority is given to the applicants who receive credit in their respective academic institutions for their internships. The internships are usually in the institutions visited during the Study Tour.

During the Study Tour the following broad topics are usually covered:

- introduction to the European Union and its main institutions (including historical review and current priorities);
- external and international relations (including enlargement, relations with Canada, Russia, Middle East, NATO, etc.);
- security issues;
- economic and financial issues;
- immigration, migration, mobility;
- internal market and competition;
- role of social partners and NGOs;
- social issues, health, environment;
- education and youth.

Up to now over 350 students from Canada have participated in the eight Study Tours initiated in 2004 and 150 have taken up internships.

The two testimonials of participants in both Study Tour and Internship Programme reflecting on the Study Tour, the Internships and the follow-up impact on their carriers, provide the best evaluation of the value of this programme from the beneficiaries (please see Appendix 2, Testimonials of Véronique Cotnoir and Jelena Kundacina).

3.2.2. "Thinking Canada" Study Tour and Internship Programme

The European Commission having assessed the success and impact of the "EU Study Tour and Internship Program" (for Canadian students) has requested that consideration to given to the development of a "twin" programme for European students to Canada. The first such programme financed by the European Commission was organized in 2010,[9] patterned on the model of the programme for the Canadian Students. In 2011 a second Study Tour and Internship Programme took place. By now over 60 students from the EU Member States took part in the Study Tour and a dozen took up internships following the Study Tour.

The selection of Study Tour participants was done by the European national Associations of Canadian studies in cooperation with an Academic Selection Committee; this committee also selected the interns in cooperation with the institutions receiving the interns for two months.

The 2011 Study Tour brought together thirty-two outstanding students from twenty-three Member States across the European Union to participate in a four- week study tour that took them initially to Brussels for an introductory session focused on the EU and EU-Canada relations and then to Ottawa,

[9] The first programme were organised by the European Network of Canadian Studies. Dr. Don Sparling, in cooperation with the EU Study Tour and Internship Programme, Professor Eduard Lavalle and Dr. Alexandre Berlin.

Québec, Montréal, Toronto, Vancouver and Victoria. The programme proved to be highly attractive, with over 360 applications received from almost all Member States. Approximately two-thirds of the participants were at the Master's level, with doctoral students the second largest group (about one-fifth) and a small number of Bachelor's-level students. They represented a wide range of disciplines: from economics, business and management, administration, public policy, political science, international relations, security and strategic studies and diplomacy through history, sociology, urban studies, architecture and environmental studies to European Studies, North American Studies, Canadian Studies, the French and English languages and literatures, and arts management.

While the Study Tour of Canadian students to the EU institutions could be easily focused geographically, this was not the case for the Study Tour to Canada which had to encompass a vast and diverse country and a complex federal-provincial governing structure as well major ethnic diversity.

The Study Tour to Canada which covered the following topics is also an excellent practical example of interdisciplinarity:

- The EU and EU-Canada relations: Political, security, economics and finance, environment, education, and youth relations;
- The federal, provincial and municipal structures and functions in Canada;
- Aboriginal people, institutions, culture and governance;
- Cultural aspects of Canada;
- Bilingualism, multiculturalism and immigration;
- Business, industry and labour relations;
- Monetary, financial and economic issues;
- Social (including pensions & social housing), health and human trafficking;
- The Arctic and the North;
- Regional development and support;
- Civil society;
- Urbanism and urban planning;
- Environmental sustainability and post-Copenhagen;
- Youth.

More specifically, to understand in depth the federal, provincial and municipal structures and functions in Canada, briefings were held at the main governmental institutions (cf. Table 2).

While for a more in depth understanding of bilingualism, multiculturalism and immigration in Canada, (Canada being a cultural and linguistic mosaic, rooted in the historical reality of aboriginal peoples, colonialism, the two founding nations and immigration as a form of economic, demographic and territorial expansion, the interplay between language and the historical reality marking its development), briefings were held at the different institutions (cf. Table 2):

Table 2. Institutions classification visited in Canada during the Study Tour and Internship Programme by topic coverage

The federal, provincial and municipal structures and functions in Canada	Bilingualism, multiculturalism and immigration in Canada
• Department of Foreign Affairs and International Trade (DFAIT) (Ottawa) • Department of Indian and Northern Affairs (DIAND) (Gatineau-Ottawa) • Canadian Parliament (Ottawa) • Bank of Canada (Ottawa) • Ministère des Relations Internationales (Québec City) • Assemblée Nationale du Québec (Québec City) • Ministère de l'Immigration et des Communautés Culturelles (Montréal) • Government of Ontario (Toronto) • Government of British Columbia (Victoria & Vancouver) • Legislative Assembly of British Columbia (Victoria) • City of Toronto (Toronto) • City of Vancouver (Vancouver) • Research Institute on Public Policy (Montréal)	• Centre de la Francophonie des Amériques (Québec City) • Ministère de l'Immigration et des Communautés Culturelles (Montréal) • Status of French Language in BC – Canadian Parents for French (Vancouver) • Multicultural Historical Society of Ontario (Toronto) • Dante Alighieri Centre (Toronto) • Multiculturalism in British Columbia (Vancouver) • Research Institute on Public Policy (Montréal)

In 2011 internships in Canada were held at the following governmental and EU related institutions, labour organizations, and think tanks to provide a large diversity of hands-on opportunities as a follow-up to the Study Tour; the internships were usually in the institutions visited during the Study Tour:

- Consulate General of Poland (Toronto), in conjunction with the University of Toronto, the European Union National Institutes of Culture (EUNIC) and the European Chamber of Commerce in Toronto (EUCOCIT); (Toronto, Ont)
- Italian Cultural Institute (Toronto), in conjunction with the University of Toronto, the European Union National Institutes of Culture (EUNIC) and the European Chamber of Commerce in Toronto (EUCOCIT);(Toronto, Ont)
- Canadian Labour Congress (Ottawa, Ont)
- Asia-Pacific Foundation (Vancouver, BC)
- SUZUKI Foundation (Montréal, Québec)
- PORTAGE (Lac Echo, Québec)
- Canadian Conference of the Arts (Ottawa, Ont)
- Office to Combat Trafficking in Persons, Ministry of Public Safety and Solicitor General (Victoria, BC)
- Health and Physical Education – Canada (Ottawa, Ont)

In view of the limited experience thus far acquired with this "Thinking Canada" programme, the best is to provide participants testimonials. The two

testimonials, of participants in both Study Tour and Internship Programme reflecting on the Study Tour, and the Internships, provide the best evaluation at this stage of the value of this programme from the beneficiaries (cf. Appendix 2, Testimonial of Barbora Poddana and Barboral Polachova).

4. Enhancement of Understanding through the Various ERASMUS Programmes

The ERASMUS programmes are a most remarkable success of the European Union by promoting and supporting inter-institutional academic mobility for students not only between EU Member States, but also with third countries. Students gain a most valuable experience through these academic exchanges. The programmes were started in 1987 and over 100,000 students participate annually in these programmes.

The value of these programmes could be even further enhanced, at almost no cost, from the perspective of increasing the understanding of the European Union among the ERASMUS students, as most of the participants in these programmes are not in the field of European studies.

One could imagine that all ERASMUS students upon arrival their exchange country would be invited to attend a one day briefing session on the European Union at the European Commission and European Parliament Representations in the EU Member State in question. The staff of these Representations could be in charge of the core of these briefing sessions. Local Jean Monnet professors and academic recipients of Jean Monnet grants could further substantially enrich them. A trial programme could be initiated in key capitals of the EU Member States, which have substantial.

The Representations having conference and documentation facilities could thus create a focal attraction point for these students who could also invite their student colleagues having an interest in European Union. The initiation of these programmes, interdisciplinary presentations in a non-academic setting should become the "normal communication vocation" of these Representations without the requirement of any substantial budgets. Furthermore it would establish a closer working link between the academia (and its students) and the European Institutions. Such an approach, implemented by the European institutions in the decentralized mode in the Member States, would be fully in line with Article 11.1 of the Lisbon Treaty "The institutions shall, by appropriate means, give citizens and representative associations the opportunity to make known and publicly exchange their views in all areas of Union action."

Latvia could serve as a testing model, due both to its size and the concentration of institutions of higher learning in the capital, Riga. It, at the same time, Latvia has a significant, but not excessive number of ERASMUS students studying in the country; the number of ERASMUS students has grown from 150 in the 2004/2005 academic year to 526 in 2009/2010. It should be also noted that most of the ERASMUS students coming to Latvia are not enrolled in European studies and thus an exposure to the EU would be of great benefit to both the students and the EU.

Special consideration, in terms of an enriched programme content, might be given for the ERASMUS students coming from countries that have the potential of becoming Member States of the European Union.

5. Conclusion

Through increased interdisciplinarity, one can get more benefits of the investments in knowledge and education that we are currently pursuing. At the same time, one can strengthen the interaction between research, education and business (the triple helix approach), so that enterprises can develop unique products which combine the most advanced knowledge within the humanities disciplines, social sciences, technology, health sciences and the natural sciences.

Through examples in education and health an attempt has been made to show the growing importance and benefits of interdisciplinary in two very different areas of human concern, as well as the need of an interrelation between them. The article also stresses how the practical implementation of this concept can be slow and arduous, and requires considerable perseverance.

Interdisciplinarity should also be transposed in the development and promotion of closer relations between the European Union Representations in all the EU Member States and students in higher education institutions.

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Appendix 1:
The endorsement of Commissioner Androulla Vassiliou, European Commissioner responsible for Education, Culture, Multilinguism and Youth

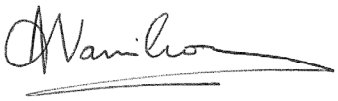
ANDROULLA VASSILIOU
MEMBER OF THE EUROPEAN COMMISSION

As European Commissioner responsible for Education, Culture, Multilingualism and Youth, I strongly welcome the Study Tours and Internship Programmes between the European Union and Canada. For the first time, European students will participate in the scheme. This will enable them to increase their understanding and knowledge of Canadian institutions and to appreciate the significance of the EU-Canada relationship.

This Study Tour complements the existing Study Tour and Internship Programme for Canadian students to Europe. It is another fine example of the EU's continuing efforts to help its citizens realise their potential through education and training by promoting mobility and exchange with the wider world. It also helps equip people to live in a more diverse and globalised Europe, based on mutual respect for our rich blend of cultures and languages.

With these two Study Tours we now have a balanced exchange of academic experiences for both European and Canadian students. They are strong examples of the successful implementation of the bilateral cooperation agreement in higher education, training and youth between the EU and Canada. This agreement, in place since 1995, aims to promote understanding between the peoples of the European Union and Canada and to improve the quality of their human resource development.

I encourage students to take advantage of this opportunity and to participate in this truly unique experience.



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Appendix 2:
Testimonials of Study Tour and Internship Programme participants

Testimonial, Véronique Cotnoir 2006

During my university studies I invested considerable amount of time and energy to develop my understanding of the various issues related to the future of Europe. Highly interested in European issues, he courses and other activities undertaken during my international studies program at the Université de Montréal (Bachelor and Masters Degrees) were directly focused on challenges faced by the Old Continent.

During the 2006 EU Study Tour, I became aware of the ambiguities represented all around the European Union: the relationships amongst Member States, the disparities within the union, the different approaches to tackle national and/or union-wide challenges, etc. This intense and enriching Study Tour has been a determining factor for my acquisition of a better understanding of Europe.

The theme that was selected for the 2006 Study Tour, social cohesion within the European Union, has shade some light on many questions I had at the time. During the three weeks program, I was able to benefit from the knowledge of more than 90 experts that work in the most influential European institutions, including governmental organisations and NGOs. Several of the presentations had a direct impact on the development of my thesis: Citoyenneté et équité dans une Europe en construction: regard sur les exclus de la citoyennneté européenne (Citizenship and Equity in a Europe under construction: a view on those excluded from the European citizenship).

Summing up, the Study Tour has been a catalyser regarding my acquisition of both general and very specific knowledge of the European Union "machine". The benefits that I gained from this experience have been invaluable as the Study Tour also provided me with the opportunity of completing two internships: one at the Centre for European Policies Studies (CEPS) in Brussels (a major European think tank), and a second at the World Health Organization Regional Office for Europe in Copenhagen. Both have contributed undeniably to my professional development.

Working now in the Canadian public service for the past five years, I am proud that the tools and knowledge acquired during the EU Study Tour and my two linked follow-up internships have had a considerable influence on my career orientation. These international work experiences have helped me to better understand the similarities and differences between Europe and North America. Working now as a policy analyst on citizenship issues at the department of Citizenship and Immigration Canada, I still take great pleasure to keep myself up to date on what is going on in Europe. I also foresee in the near future to work abroad as an immigration officer. Hopefully, this new job will bring me back to my first "love", the European Union.

Véronique Cotnoir
MA International Studies, Université de Montréal

Testimonial, Jelena Kundacina 2010

I participated in the European Union Study Tour and Internship Program during the summer of 2010 between the first and second year of my Master of Arts program. At the end of my first year I was unsure of my future direction and options, both academically

and personally. The Study Tour offered me a unique interdisciplinary insight not only into the internal functioning of the European Union and its various, complex institutions, but it also provided me with a rare opportunity to live and work in Europe for two months as an intern, while discovering the professional and academic possibilities within the fields of political science and international relations.

My two-month internship at the Executive Agency for Health and Consumers (EAHC) in Luxembourg allowed me to formulate ideas for my Master's thesis, gather information from primary sources and experts and, concomitantly, begin to build a network of professionals in the field and fellow participants in the Study Tour with common interests.

Upon completion of my degree, I returned to Europe thanks to the EU Study Tour Program for a six-month professional formation internship, hosted by the International Organization for Migration (IOM) and supported by the World Health Organization (WHO). As a part of this internship, I acted as the Liaison Officer between the WHO/IOM and the Ministry of Health of Republika Srpska, Bosnia and Herzegovina, aiding in the organization of a high-level event: the Third Health Ministers' Forum of the South-East European Health Network (SEEHN). During the two months in Banja Luka, I gained invaluable experience in event organizing, conference planning and regional diplomacy in one of the most politically complex regions of Europe.

All of these opportunities opened because of the EU Study Tour and Internship Program and its interdisciplinary approach that introduced Canadian students to the EU as a political, economic, juridical, social and cultural phenomenon. During the 3 weeks of the Study Tour, I was able to explore many different fields – some of greater, some of lesser personal interest – and interact with experts and peers from vastly different academic and professional backgrounds. The knowledge and experience gained during the Study Tour provided me with a greater versatility and ability to later synthesize information and actions in my professional engagements, and has increased my flexibility within the highly interdisciplinary world of the EU and international institutions.

Jelena KUNDACINA
(MA Political Sciences, University of Toronto)

Testimonial, Barbora Poddana 2010

EU-Canada Study tour 2010 was one of the greatest experience I have ever had in my life. I was very lucky to be chosen as one of the two participants to follow up on the study tour with a two month internship. Mine was at the Institute of Research on Public Policy, called IRPP in Montréal. It is the oldest policy think tank in Canada and I found out that it is very respected and popular among Canadians, not only in Québec. For me, it was an excellent opportunity to get familiar with different research topics they were working on, such as immigration and multiculturalism, science and technology or palliative care. Before I came to the IRPP I did not have any idea what kind of people might work there and out of the sudden I ended up in a first class independent policy institution where I was working with the top scholars, researchers or former politicians. I was helping with the research but also with the organization of working lunches or seminars, sometimes with the real political elites of Canada. I am so grateful, that I got this opportunity and I think I have extracted it the most I could. It gave me a lot from the professional perspective as well as from the educational one. I am finishing my thesis on the Economic integration of Immigrants in

Canada and most inspiration and materials I got during my internship while discussing it with my colleagues who were specialists in this field and regarding the professional benefit, I would like to mention my work at the Embassy of Canada in Prague where I was admitted to the Commercial department after my arrival from Canada. I would like to thank to the organizers of the Study tour for their unrelenting efforts and enthusiasm. There should be more projects like this, because this makes people know the world and get connected!

Barbora Poddaná
University o Economics, Prague (CZ)
Trade Commissioner Assistant / Déléguée commerciale adjointe
Embassy of Canada / Ambassade du Canada
Czech Republic

Testimonial, Barboral Polachova 2011

The EU – Canada Study Tour 2011 followed by the internship at the Canadian Conference of the Arts contributed to my personal and academic development as any of my experiences so far. Personally, I believe I will benefit for the rest of my life from this 12-week experience, the time when I had the opportunity to encounter with and learn about the Canadian values of understanding, respect and pragmatism.

The Tour was very carefully crafted to show us all possible perspectives on Canada through lenses of diversity of people who care about the world around them. We were constantly challenged by comparison between the dynamics of domestic policies in the EU and Canada on the other side. As we grasped the functioning of the EU during our first days in Brussels, we were able to compare the dynamics of European integration with Canadian federalism, different domestic policies but also the differences in cultures.

Academically, the biggest contribution of the Tour for me was the very thorough introduction to the Canada-EU Trade Agreement negotiations and its background. It was thrilling to see the development of the different views on the process either from the governmental officials or non-governmental players. The Tour greatly prepared me to jump into the 8- week internship experience at the Canadian Conference of the Arts, the oldest advocacy forum for the Canadian cultural sector. The background on the CETA, functioning of the legislative process in Canada and EU and overall recognition of differences between the two entities, it all helped me to grasp to evolution of the new Copyright Modernization Act (known as C-11). The experience from talking to many stakeholders in the CETA negotiations helped me to link the impact of the bill not only on the domestic cultural sector but also its effects on the trade negotiations. It all blended together. At the CCA, I had the opportunity to see the whole spectrum of different opinions and interests on the legislative process of passing the C-11. I believe, that although I have Arts management and American studies background, I believe that I have met the main goal and purpose of the program -the orientation in the Canadian political and social landscape but also determination to bring some of my personal and academic Canadian experience to my home country.

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Iasonas Lamprianou

Interdisciplinary Research Methods in Social Sciences: Advances and Applications

Abstract

Social Science research methods have a very rich and interdisciplinary past. Social scientists have always been ready to adapt new and promising research methods from other disciplines and this gave them the opportunity to produce state-of-the-art knowledge. This chapter presents three modern advances and applications of methodological tools: the Social Network Analysis, the Geographic Information Systems and the (automatic) Text Analysis with on-line data collection. We present practical examples with empirical data, and we predict that social scientists will continue to benefit by adjust modern research tools to their needs.

Keywords: Statistical Methods, Geographic Information Systems, Social Network Analysis.

1. Introduction

The main body of Social Science research is today based on traditional quantitative and qualitative methods like, for example, regression and analysis of variance for quantitative data and content and textual analysis for qualitative data etc. A thorough search on the web pages of Master's degrees in Social Research Methods of various Universities may reveal the extent to which academia still hangs on the "old and tested" research methods which have served the academic community faithfully for many years. However, technology and interdisciplinary research have recently created the momentum for the development of new techniques which employ technological as well as conceptual innovations that can be used in applied Social Science research. The aim of this chapter is to describe the interdisciplinary nature of specialized new research methods which have recently started finding their way into Social Science research. Although they are not still considered to be "mainstream" research methods, they are gaining ground very rapidly because of their versatile nature and the wealth of new research questions they can address.

This chapter focuses on three such techniques, namely the Social Network Analysis (SNA), the Geographic Information Systems (GIS) and (automatic) Text Analysis in combination with on-line research. All three developments share the same attributes: in their current form, they were born out of the rapid development of technology and they became more widely available through the increased availability of open source software.

These methods are – in some perspective – different to the more "traditional" ones in the sense that they require different types of data (or a different organization of the data) which sometimes leads to a need for different data collection methods. However, a closer look can reveal the tremendous potential of those methods to unleash a whole new dynamic into the research field of Social Sciences.

2. Advances and Applications in Social Science Methods

The word "advances" has been frequently used in the academia in order to describe research methods which – at the time – were not considered to be mainstream methods, although they had probably existed (or "invented") long before. It is interesting to study the contents of a book which was published almost three decades ago and their title promised to present an account of the "advances" or "the new tools" for social scientists at the time.

We may refer to the book of Berry and Lewis-Beck (1986) with the title "*New Tools for Social Scientists: Advances and Applications in Research Methods*", published by a very reputable publisher. Going through the table of contents of the book, one may identify chapters on the analysis of covariance, non-parametric multidimensional scaling, logit and probit models for multivariate analysis, time series and the like. These are all interesting methods, and very useful to the social scientists indeed, but they were not really "new" at that time, in the sense that these methods had been "invented" or conceptualized some time before the publication of the book. The authors of the book were basically suggesting that the book included methods which were not "mainstream" at the time, possibly trying to grab the attention of the readership and update the academic community on those advances.

It is true that there is almost always a time lag between the conceptualization and the development of some methods, and the mainstream use of the methods for social science research. This time lag is probably necessary because a new method may be harder to comprehend and to use than an "old and trusted" one. We also need to take into account the issue of training time and the (probably) inevitable publication delay: a number of years are needed until a critical mass of researchers learn to use a new method, and some time is needed until a bulk of papers using that method is finally published in reputable peer-review journals. Only then, a method may be assumed to be entering the mainstream.

The methods presented in this chapter are new in the sense that they have not yet entered the mainstream, although the conceptualization and initial use of some of these methods may be "older". We, therefore, refer to advances and new applications for social science methods, and we hope that – within the restrictions of a short chapter – we will have the opportunity to give a useful account of the nature and the uses of each of the three methods.

2.1. Social Network Analysis

Social Network Analysis (SNA) investigates the relationships which connect individuals and other social entities (such as schools, organizations etc.) and

also studies the interdependencies of those entities. O' Malley and Marsden (2008) propose that "*recent advances in computing power have made possible solutions to previously intractable problems, leading to a number of new models and methods for analyzing networks*" (p.223). However, SNA can be found in Social Science research decades ago when Berkman and Syme (1979) investigated social support networks that served to improve individual well-being by providing various forms of resources (e.g. psychological).

According to Scott (2000), seeds of the ideas of social network analysis may be found in writings going back to the ancient Greeks but the fundamental and systematic development of the field (as we mostly know it today) occurred in the 1930's by groups of researchers in different traditional research fields. Researchers in those fields were working independently (as researchers frequently used to do in the times before the internet and the advent of modern transportation), but their work had similar characteristics.

The first example comes from the scientific field of Psychology, through the work of Jocob Moreno, who may be credited with the foundation of Sociometry. Moreno conceptualized and built the relationships between people and their friends (a typical example of a modern social network analysis) and how these relationships created limitations and opportunities for their psychological behaviour. Moreno went on to establish the journal "Sociometry" and invented the sociogram (which is a fundamental concept of SNA today).

The second example of Scott (2000) comes from the field of Anthropology. Researchers in the field of Anthropology gave emphasis on the social relations and the web of relations that comprised society. Their endeavours – at the empirical level – were first materialized by the work of Warner, Mayo, Roethlisberger and Dickson on the Hawthorne plant of the Western Electric Company in Chicago in the 20s where they observed the "informal organization" of the company and its hidden social structure.

Finally, Scott (2000) refers to the discipline of Mathematics and Statistics (especially graph theory) which actually gave flesh and bones to the modern SNA literature. Indeed, both sciences today play a central role in the development of SNA which is evolving to a whole research sub-field by itself (for example, see some of the recent papers on exponential random graph models of the journal Social Networks).

We cannot, of course, neglect to mention Computer Science and Software Engineering; both fields opened the way to the development of the necessary tools to analyse social network data and illustrate them graphically. One might acknowledge, for example, the rapid development of dedicated open-source software on SNA within the R package platform (R Development Core Team, 2011). At the intersection of various disciplines, SNA software has been developed and is freely and publicly available for the advancement of science.

It is interesting to note that researchers from so diverse disciplines worked seamlessly together to produce one of the main tools of Social Science research today – the SNA. Indeed, one might suggest that the history

of the development of SNA is a very bright example of how fruitful interdisciplinarity can be.

The most common, and simple, modern conceptualization for a social network is to consider it as an organized set of one or more sets of units (also known as ''nodes,'' ''actors,'' or ''vertices'') accompanied with the relationships or ties among them. These units (we will hence call them nodes) are usually individual persons, e.g., students in a class, colleagues in an office or co-authors of academic papers. The relationships that link those nodes could be of any form such as communication, influence, friendship, court law suits against each other etc. Frequently, social network studies include attribute data describing the nodes or the relationships that link them (or even both sometimes e.g. attribute data may include the gender or the age of the actors).

As was mentioned above, networks are representations of systems in which the vertices (or nodes) are connected by ties (Wasserman and Faust, 1994). Most networks are usually defined as one-mode networks with one set of nodes that are similar to each other (e.g. a network may be built by asking the students of a class to define which of their classmates are their friends). Therefore, all nodes in a one-mode network belong to a single set (e.g. they may all be students of the same class).

The fundamental concepts of a one-mode network are nodes and edges (nodes represent the actors/persons and edges represent the relationships between them) as shown in Figure 1. One could assume that Figure 1 represents three persons (A, B, C) who indicated each other as "friends" when they were asked.

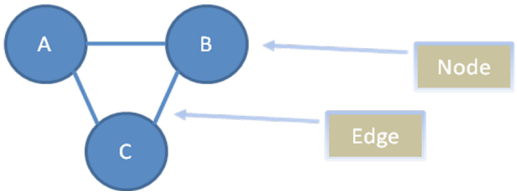

Figure 1. A triad of nodes showing three persons linked together

However, sometimes, people or organizations may form two-mode networks which are also known as affiliation or bipartite networks (Borgatti and Everett, 1997; Latapy *et al.*, 2008). These networks are different than the one-mode networks because they include two different sets of nodes e.g. we may build a network by using one type of nodes representing the Boards of Directors of companies and different nodes representing the members of (the persons who consist) these Boards. In such a two-mode network, we may identify people who belong to more than one Boards of different companies. Therefore, in such a network, different persons may share membership to the same Boards and we may deduce that these persons are indirectly linked because they share the same affiliations. People sharing membership to the same Boards may be considered to enjoy a channel of communication or they may share the same resources etc. Such studies have actually been carried out

in the recent past investigating the social capital of the Boards of Directors in big organizations (Nicholson, Alexander and Kiel, 2004) using SNA, but the concept of affiliation networks may be extended to any field of social life.

Figure 2 illustrates a two-mode network. Let us assume that Figure 2 represents a group of people linked to the events they participated during a series of celebrations.

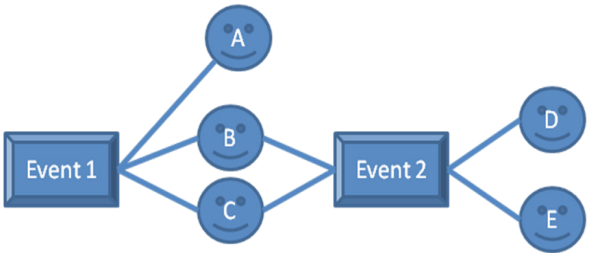

Figure 2. A two-mode network of people linked to the events they participated

From Figure 2, we understand that persons A, B and C participated in Event 1, but persons B, C, D and E participated in Event 2. Note that the persons may be considered as linked indirectly, through their common participation in the same events. Therefore, we might deduce that persons B, C, D and E are indirectly linked because they participated in Event 2 but persons B and C are at the same time related to person A. We may convert the two-mode network to a one-mode network which is illustrated by Figure 3.

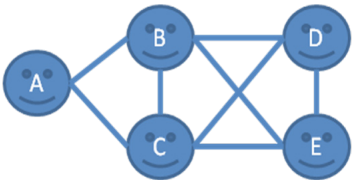

Figure 3. A one-mode network which consists only of persons linked by their common participation to the same events

According to standard network terminology, persons B, C, D, and E are called "a clique" because they are all linked to each other, whereas person A is clearly more isolated compared to the others. Although it is beyond the scope of this chapter to go into technical details, it is interesting to mention that a wealth of statistics have been developed to describe the position of an actor in a social network e.g. "centrality" indices have been developed to indicate how centrally located (i.e. how "important") an actor is in the network (Opsahl et al., 2010).

In the next section, we will demonstrate the use of SNA with empirical data. We will create a two-mode network, convert it to a one-mode network and investigate the existence of cliques and influential persons who act as bridge between groups of persons.

Empirical example of SNA

In order to make our description of SNA more concrete, we offer an example using empirical data.[1] The dataset is part of an ongoing research which aims to investigate the social and organizational structure of nationally-oriented clubs through an analysis of the social networks of the individuals who take part in their activities and social events. This investigation has been attempted by an analysis of archives of photographs of various events and activities which took place in the last few years. The dataset consists of an analysis of sixty photographs, taken from ten different activities from four different clubs. Each of the first three clubs offered photographs from three different events and one of the clubs offered photographs from only one event.

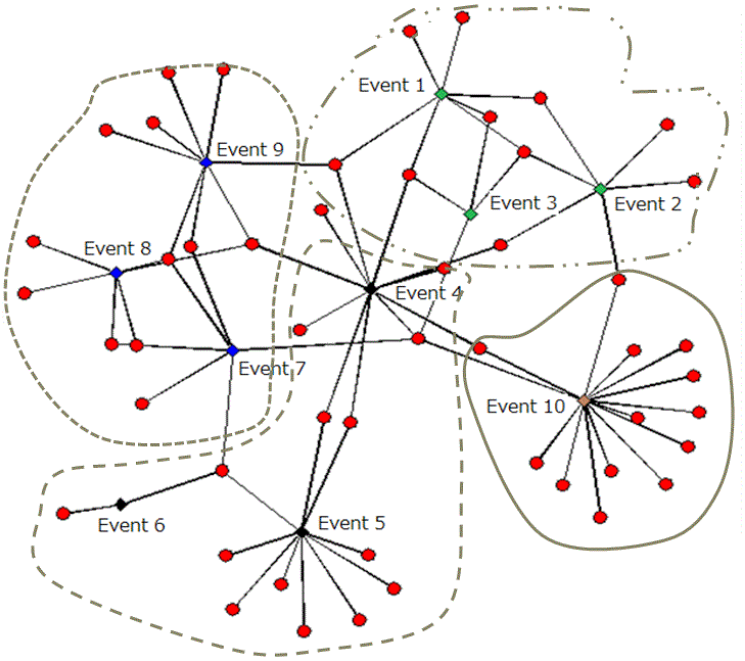

Figure 4. A two-mode network consisting of ten different events (the squares) from four different clubs (different colors indicate different clubs) and individuals (red circles)

A social network graph was created using information from all 60 photographs. Firstly, the persons in each photograph were identified. Then the data were fed into the appropriate software which created a graph illustrating who participated in each event/activity (see Figure 4). It is important to observe

[1] The data were collected by Petros Demetriou (Department of Social and Political Sciences, University of Cyprus). We thank Petros for his permission to use his data for the purposes of this chapter.

that events are illustrated by a diamond and the members (the persons) are illustrated by circles. Each circle (person) is linked to one or more diamonds, denoting that this person participated in one or more events. Figure 4 may be used to illustrate not only how persons are linked to events, but also how people are indirectly linked through their common participation in some events. Apparently, there are people who are indirectly linked to more people and there are other people who are rather isolated.

As expected, from Figure 4 we realize that the members of each club tend to share memberships of the same events; however, there is a central event (Event 4) which attracted persons from all clubs. Investigating the nature of the specific event we realized that it was a commonly organized annual event which aimed to bring together persons from all clubs for a common celebration.

From the two-mode network (i.e. Figure 4), we can build a one-mode network by connecting all persons who participated in the same events (see Figure 5). As a result, we can see how individuals cluster together forming "cliques" who are usually members of the same clubs. It may also be observed that there are communication paths between these groups of people, however these paths of communication are not direct, but pass through specific influential persons.

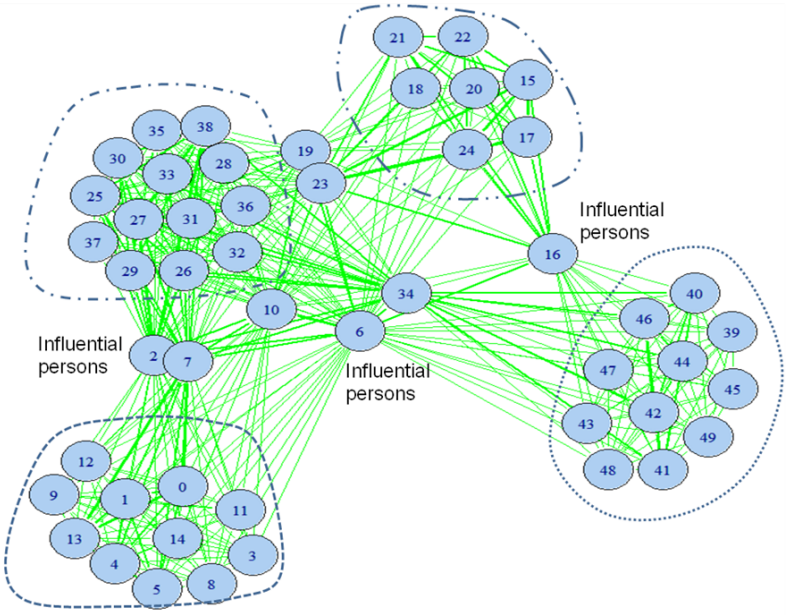

Figure 5. One-way network indicating cliques of persons participating to events and activities

According to Figure 5, influential persons demonstrate many links with persons from different clubs, therefore acting as a bridge between different clubs. In SNA, it is accepted that such "bridges" may potentially act as

channels which allow the flow of ideas, communication and resources between groups of people. Persons with this characteristic are said to have high "betweenness", because these people control communication between other people and are considered to have a central social role. Such people usually carry increased political clout and their identification is an important part of the analysis of the structure and the operation of social network.

Through this rather simplistic example, we attempted to illustrate the usefulness of SNA. We suggest that SNA may be a very useful tool in the toolbox of social scientists. We are certain that while the necessary software becomes more accessible, more and more social scientists will employ SNA in their social research. It will take, however, some time in order to train enough younger researchers to use the relevant software and comprehend some of the mathematics behind the models.

2.2. Geographic Information Systems

Although several elaborate definitions might be proposed, we prefer to define Geographic Information Systems (GIS) as systems which are designed to store, manipulate and analyze various forms of data in order to produce maps or other forms of spatial information. For example, one might use a GIS in order to produce the map of a city illustrating suicide rates in different neighborhoods. As a second example, one might produce a map illustrating how the academic performance of students varies between different districts or neighborhoods of a city or a larger metropolitan area.

The concept of illustrating quantitative data on a map is not new. One of the best realizations of this concept (dated back to 1861) belongs to the French engineer Charles Joseph Minard who portrayed the losses suffered by Napoleon's army in the Russian campaign of 1812. Charles Joseph Minard's illustration began at the Polish-Russian border and used thick band to show the size of the army at each position on a map. He also included the path of Napoleon's retreat from Moscow in the winter, although he chose to depict this march by a dark lower band. What is mostly amazing is that this information was accompanied by temperature information at every point of the march! This is a good indication that much GIS work has been done in the past by hand, using paper maps and color pencils; however, anyone can understand the limitations of such an endeavor. It may probably be compared to trying to write a novel using an old-style typewriter instead of computer word processing software: it can be done, but the effort and time needed is not comparable (and the result may not be as neat)!

More recently, probably in the last decade, the use of GIS as Social Science research tool has become more wide spread because of the wider use of computers, the more easily accessible user-friendly specialized software (especially open-source software) and the cheaper computational power (cheaper but faster computers can analyze larger datasets more efficiently and using more complex models). However, even in the older days, social scientists used geographic analysis in their research. For example, Florence Kelly, a social reformer and political activist and one of the original founders of the National Association for the Advancement of Colored People (NAACP),

created maps to show patterns of social conditions and social inequality. Back in 1893, she used geographic analysis to map the "Slums of the Great Cities Survey Maps."[2] At around the same time, and more specifically between 1886 and 1903, another well known researcher, Charles Booth, produced a series of maps of London coded for social class illustrating data gathered by visiting every street in London.[3]

However, the use of modern GIS software in modern Social Science research gets complicated because of the technical expertise that is needed in order to understand how the GIS work, how the data need to be formatted and how geographic data need to be collected. As far as the collection of geographic data is concerned, a researcher may face technical as well as ethical problems. We will firstly refer to the technical problems through an example: when mapping people who live in poverty (and especially when mapping homeless people), it is important to understand that people move and may not stay for long in the same neighbourhoods. It may thus be difficult to relate specific people to specific areas.

Changes across time may also be related to changes across space and this may complicate data collection and analysis even further. For example, if we want to model the spread of income and unemployment and their relationship to crime incidences, should we model the permanent residence of people, or their employment address or the places where they spend most of their time? And how do we take into account the fact that people change jobs as well as residence addresses frequently? And how do we model the fact that people may be in employment today, but unemployed the very next day? It is important to realize that using GIS, we frequently present snapshots of "reality" and these snapshots may change very quickly. This adds another layer of complexity in the sense that we need to allow for multiple (across time) representations of data using computer animation, which can be really impressive and informative; however this does not alleviate the problem of accurate data collection in such a haphazard social environment.

In addition to the technical problems, when dealing with people, researchers almost always face ethical issues e.g. issues of privacy, or issues of collecting and using sensitive data. In Social Science research, privacy is usually a very important issue and can have ethical as well as legal implications. Trying to anonymize the data can frequently lead to a loss of the initial detailed data, thus forcing the research community to an expensive replication of data collection. It is likely, however, that geographic data are more expensive and time consuming to collect, process and analyse than other types of data (e.g. questionnaire survey data).

Steinberg and Steinberg (2006) offer a useful account of how GIS may be used in Social Science research. They expand the concept of "G" (geographic) in the GIS acronym in order to cover many more concepts than just purely geographic information:

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[2] The interested reader is redirected to http://www.teachspatial.org/node/792

[3] The interested reader is redirected to http://www.csiss.org/classics/content/45

> Mapping attitudes, ideas, social networks, and countless other human constructs should be viewed as equally valid as mapping the latitude and longitude of a data point on the ground. Numerous opportunities, limited only by the creativity of the researcher, allow GIS to extend into realms not envisioned by the traditional geographies originally programmed … (p.12)

Such approaches open new routes to Social Science research through the use of modern computer, software and data collection techniques. GIS is surely a valuable addition in the weaponry of a social scientist, a tool which initially originated in its current form (around 1960) in Ottawa, Ontario, Canada by the Federal Department of Forestry and Rural Development and was called the "Canada Geographic Information System" (CGIS). The system was used to handle data collected for the Canada Land Inventory which aimed to determine the land capability for rural Canada. It gradually gained widespread use and found its way in the Social Sciences because of its versatile and powerful nature. Although its use comes with the specific limitations and difficulties we mentioned above, we predict that its use will gain even more momentum to cover even more aspects of Social Science research.

2.3. Text Analysis

One of the most promising advances in Social Science methods is the generation of tools for the visualization of documents and texts. These techniques have been around for some time in the form of qualitative research methods, but because of the use of readily available software and much computational power, they have been gaining ground for the last few years.

One of these recent advances is called "Text clouds" or in other words "Word clouds" which means that through the analysis of text, it is possible to visualize the content of the document and build simple graphs which can illustrate some relationships between the words that form the text. There is a wealth of available software, the use of some of which is free and anyone can access them by a simple search on the internet (e.g. google for "Wordle"), but the use of open-source software such as R (R Development Core Team, 2011) will be illustrated below.

A nice example of how these tools may be used for content analysis is a recent comparison between a speech by Sarah Palin and a speech by Barack Obama on the tragic events of the Tucson shootings, where nineteen people were shot during a public meeting that a US Representative was holding for constituents in a supermarket parking lot. Figure 6 illustrates the most frequent words used by Sarah Palin (to the left) and Barack Obama (to the right). The farthest to the right a word is, the most frequently is used by Barack Obama. The farthest to the left a word is, the most frequently is used by Sarah Palin. The size of the word shows the frequency by which each word was used in the two speeches.

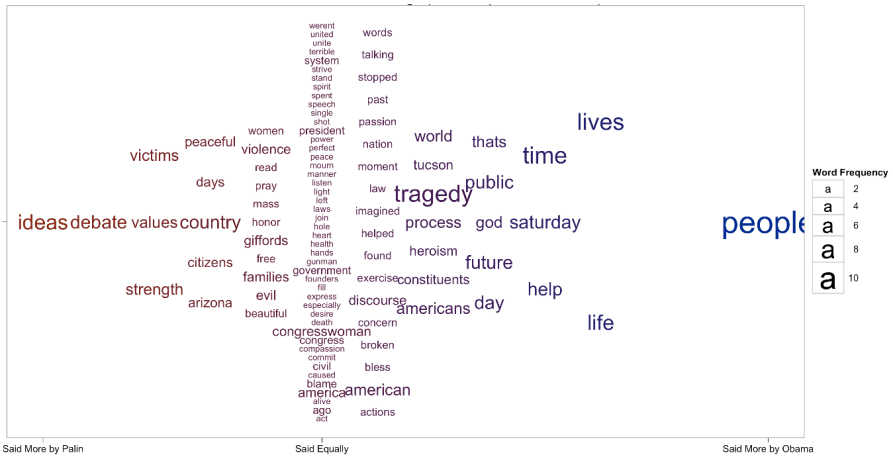

Figure 6. Tucson shooting speeches (Obama vs Palin)[4]

Through the visualization of their speech, it is obvious that the two politicians have tapped on different issues regarding the events. Barack Obama chose to stress the word "people" and focused on "life", "lives" and "tragedy" whereas Sarah Palin stressed the words "ideas" and "debate" and focused on words like "values", "peaceful" and "country". Both politicians used the words "congresswomen" and "America" equally but also frequently. It is interesting to note that the word "tragedy" is used often in both speeches, but slightly more by Obama and that is why it is located slightly to the right side of the "Said Equally" column of words).

In addition to "Word Clouds", online text mining is slowly emerging as a powerful tool for text analysis. For example, using R, a researcher can automatically harvest twitter posts regarding any concept and visualize them instantly (more information on the exact commands and the R packages needed may be found on the internet[5]). For purposes of illustration, we used R in order to harvest 200 random posts from Twitter for the word "riots" and we generated a relevant word cloud (see Figure 7).

[4] The figure was created by Drew Conway and was downloaded from his blog on January 27th, 2011. Available at: http://www.drewconway.com/zia/?p=2624

[5] For example, visit http://heuristically.wordpress.com/2011/04/08/text-data-mining-twitter-r/

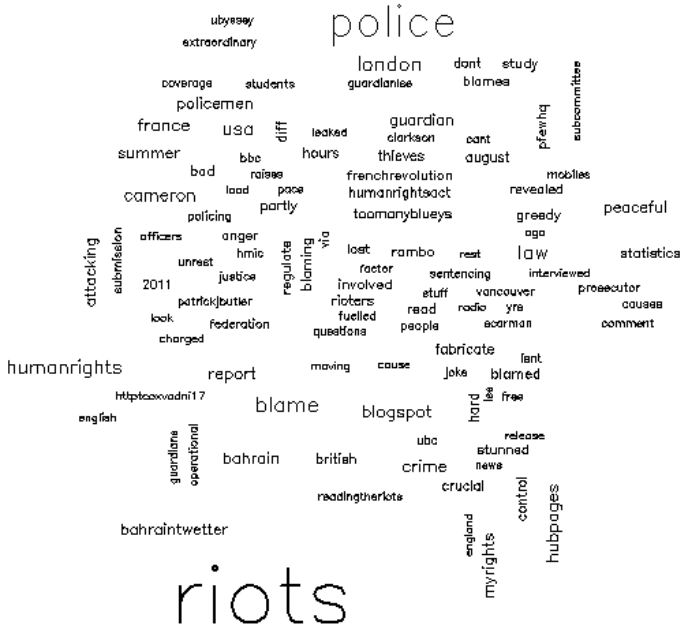

Figure 7. A word cloud from 200 random twitter posts for the word "riots"

Investigating the word cloud, it is relatively easy to observe that the "riots" appear in the same posts as the words "police" (large size = very frequent word), "human rights" (left side of the figure), "blame" etc. The generation of the whole procedure did not last more than a single minute, from the harvest of the data to the generation of the word cloud.

The academic community is just beginning to use these research tools in their full potential in Social Sciences. McNaught and Lam (2010) suggested that word clouds may be used as supplementary research tools (i.e. supplementary to the traditional ones). More specifically, the researchers suggested that the word clouds were "*a fast and visually rich way to enable researchers to have some basic understanding of the data at hand. Word clouds can be a useful tool for preliminary analysis and for validation of previous findings.*" (p. 630). Although different researchers may have a different attitude towards such a modern approach of social research methods, it is important to realize that because of the advent of internet and the increased availability of data on-line, the proliferation of such "automatic" research tools is arguably inevitable.

3. The Future of Social Sciences Research Methods

The use of the internet for data collection purposes and the use of modern visualization techniques for research purposes slowly find their way to social sciences research, usually through interdisciplinary studies that bring together traditional social scientists and more technology-savvy researchers.

The use of modern text analysis techniques may open the way to new and more efficient use of resources for research purposes, although it is possible that some time is needed before those techniques become mainstream research tools.

This chapter focused on the presentation of the state-of-the-art developments and applications in the world of Social Science research methods, presenting these methods through publicly available, open-source software. The availability of this free state-of-the-art software generates new hopes for the democratization of the research and academic world. In the past, the purchase of high-end and expensive software was a barrier to the less privileged researchers to compete with the more well-off researchers of the rich universities of the West. We hope that this democratization of research opportunities will lead to more social justice within the Social Sciences academia. We are certain that the interdisciplinary roots of Social Science methods will continue to provide social scientists with new, versatile and efficient research tools.

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Tatjana Muravska

Interdependence of Studies: European Studies as an Example of an Interdisciplinary Educational Programme

Abstract

In education and research that respond to the global challenges is a clear interdependency particularly in areas such as governance, sustainability and corporate social responsibility. This trend leads to the development of interdisciplinary programmes at higher educational institutions. The paper discuses European Studies as an interdisciplinary dimension in education as well as how higher education and research through European Studies could respond to the current challenges and effects of European integration. It demonstrates that implementation of European Studies programmes at university level is an obvious strategy for higher education institutions as this gives students an opportunity to acquire a solid knowledge not only about the place of Europe in the global settings, but also about the European Union (EU) as the most advanced regional integration block. The paper points out that European Studies programmes contribute to build a stimulating research environment, by applying modern social and economic trends in the study courses. The development of analytical skills, generic and specific knowledge ensured by European Studies graduate programmes is an asset in areas, where in-depth knowledge of contemporary EU matters is the focus of university studies.

Keywords: European Studies, interdependence, interdisciplinarity, skills and competences.

1. Interdependence and interdisciplinarity in Social Sceinces

Interdependence of studies as, for example in areas such as governance, regulation, corporate social responsibility and sustainability is an obvious trend in the modern type of education at a university level. Educators, researchers and practitioners, are confronted with challenges, that are becoming more and more important and thus interdisciplinarity remain a controversial topic at many higher educational institutions (HEI). Higher education must respond to the new challenges of a world economy that is becoming ever more integrated -more global- with the interaction of political, economic, social and other dimensions in these processes strengthening the mutual ties between national, regional and international communities. During the past years qualitative changes in regional integration arrangements have taken place. Current developments in the EU are the most significant ones compare to the other regional schemes, especially after the last EU enlargement rounds in 2004 and 2007, and the entry into force of the Lisbon Treaty and financial

and economic turmoil during 2008-2011. Changes in European political, economic and social environment imply a growing demand for knowledge of EU economic, political, social and legal matters. Higher education and research must respond to the challenges and effects of international and European integration and, consequently, to the increased demand for skills and knowledge relevant to the economic and political environment. Today's economic and financial crises have served as good examples for these developments, but what is even more important they have also shown the ability to manage and influence the course of these events.

Integrated study programmes in social sciences promote civic competences and provide coordinated, systematic study of such disciplines as economics, political science, law, business and management, regional science, history, sociology and anthropology. In addition, the content of these programmes should include appropriate contributions from humanities, mathematics, and, possibly natural sciences. To study integrated disciplines in social sciences in interdisciplinary manner helps students to develop the ability to make informed and reasoned decisions for the public good, as citizens of culturally diverse, democratic societies in an interdependent world.

This is specifically important for all the New Member States since these countries have undergone serious political and socio-economic changes before the accession to the EU, during the post-accession period, at the time of the economic downturn in 2008-2010 and economic recession of 2011. All these changes affected practically all aspects of daily life and had significant long -term economic and social results. All the New Member countries had integrated their higher education systems into European Higher Education Area, which required reforms in higher education to comply with the process of Bologna declaration's implementation.[1] Particular attention during the reform process in the current period is given to the three cycles' curriculum development, workload-based credits as units to be accumulated within a given programme, curricular design that takes into account qualification descriptors, level descriptors, skills and learning outcomes and promotion of mobility in Europe. To meet challenges of the above-mentioned themes, a number of European Studies courses and programmes have been launched in many EU countries. Development of interdisciplinary programmes in higher education system of which European Studies programmes are - is an obvious strategy for the higher education institutions (HEI). This trend offered to students and young researchers an opportunity to acquire a solid knowledge about Europe and the European Union. Implementation of such programmes also contributed to creation of a stimulating research environment. Development of analytical skills of graduate students and specialist knowledge promoted by European Studies is an asset in areas, where profound knowledge of contemporary European Union matters is required. In other words, European Studies prepared academically educated

[1] See: The Bologna Declaration of 19 June 1999. Available at: http://www.bologna-bergen2005.no/Docs/00Main_doc/990719BOLOGNA_DECLARATION.PDF; Berlin Communiqué (Berlin Summit on Higher Education. Available at: http://www.bologna-berlin2003.de/.

qualified specialists in the fields of vital importance for the EU and their home countries. Graduates are able to successfully perform in public sector and non-governmental institutions at the EU and country's levels; they can make an objective analysis of the ongoing processes of European integration. European Studies programmes contribute also to the development of the civil society by combating, for example, such issues of current importance as financial problems, public dept and lack of confidence by suggesting new fiscal, safety and justice mechanisms. Interdisciplinary is also a valuable tool in decision-making process and analysing different policy options. Usually there are wide variations in preferences and values for decision-makers and stakeholders concerning qualitative and quantitative aspects, as well as social attributes of alternatives in a decision –making process. Interdisciplinary approach can help to identify trade-offs and different policy options, as well as evaluate what is the most optimal and relevant policy choice.

2. Structures of European Studies Programmes

European Studies programmes in the HEI have been largely developed up to the second cycle level. Programmes lead to the MSc degree in European Studies in most cases. Principal "cores" disciplines in these programmes are history, economics, law and political science/public administration as well as regional science. The interdisciplinary European Studies master`s programmes were envisaged as continuation of the first level programmes mainly in economics, political science and law. However, growing importance of providing information through all the media about EU matters, influence strongly the demand for translators and journalists, especially in the New Member counties including Latvia after post-accession period. Development of advanced skills and knowledge for these groups of audience resulted in recent years in admission of students with linguistic background and students from communication studies. The basic knowledge acquired during those studies is to be deepened by theoretical and practical studies, as well as complemented by studies in the related fields.

The design and implementation of the European Studies courses and programmes in Latvia is consistent with European Studies programmes in other HEI in the EU countries. However, as the experience shows, the dynamic developments of the EU imply that such interdisciplinary studies need to be regularly reviewed, upgraded and refined.

The European Studies programmes are therefore characterised by a specific methodology used both in teaching courses and in research. The common feature of all European Studies programmes is the focus on the European integration processes in Europe and more concretely, the development of the European Union. Relevance for the European Union and applicability for decision makers especially in public administration are important features for these programmes. According to the common knowledge, the development of the European Union only is understandable in a combination of various disciplines in social science and humanities (Hansen, Muravska, 2003).

This trend reveals that European Studies courses and programmes are often both multi- and interdisciplinary. Multidisciplinary trend represent a combination of disciplines relevant to European Studies that are studied in parallel. At the same time, when the disciplines studied are aimed, for example, at problem- solving that requires knowledge of different disciplines, this in the inter-disciplinary approach in studies. The move from multidisciplinary to interdisciplinary teaching and learning is a core element in the development of the curriculum of European Studies in the HEI.

3. European Studies Programmes as a Response to New Challenges

The more than 10 years of existence European Studies programmes in Latvia and, in particular at the University of Latvia, shows that the establishment of this type of programmes and courses is a result of the interrelation between demand and supply.

Demand for programmes is caused by the need for in-depth knowledge about the European Union and the need for academic research related to trends in the integration process development in Europe, which deeply influences the society in Europe at all levels. This type of education is always valuable for future civil servants, as they require a profound knowledge about policies in the European Union and the role of decision- making in a multiplayer governance system where EU institutions, national governments and local governments are the main players. This knowledge about the EU is also valuable for the social partners, the non- governmental organisations, as well as the business world.

However, often contradictions in understanding the nature of interdisciplinary programmes at the universities might be an impediment for the launching and functioning of European Studies programmes. There are institutional barriers for implementation of interdisciplinary programmes, if the decision-making governing bodies at the universities are reluctant to allow interdisciplinary activities to be developed. It might require willingness to establish, for example academic centres with some competences to organise teaching and research if such barriers are to be removed. Other types of impediment are the natural barriers that exists in form of 'scale economies' i.e. efficiency of specific programmes increase more than proportionate with the resources devoted to the programme (Hansen, Muravska, 2003). Core elements of programmes such as economics, political science, law and history, should be represented in the European Studies programme if it is to provide students with relevant and up to date information about the EU and the 'state of the art' in this area. When all these subjects are to be offered at a given university, the cost per student might be prohibited. To mitigate this economy of scale cooperation with other universities is needed to establish schemes for student and staff mobility; best examples are the EU Erasmus and Erasmus- Mundus programmes. These will in many cases only be possible if English is the vehicular language used in teaching and research activities. Most teachers and researchers involved in European Studies programmes

accept this constraint. At the same time, there are more diverging views when it comes to the specific outline of the programmes and especially the balance between specific EU-courses and methodological courses at the master level programmes. There are also differences in the structure, content and approach to teaching both according to national traditions and traditions in the departments which implement these programmes. However there are also similarities in the objectives of the degrees and competences (Gonzales, Wagenaar, 2005, p.93–98).

There are several academic and professional bodies in the area of European Studies, as, for example, European Community Studies associations (ECSAs). Representatives from these associations meet regularly at national levels and at periodic ECSA World Conferences. European Commission Jean Monnet Programme supports multi- and interdisciplinary education and research in European Union integration. Besides the European Commission Representations in each of the EU Member States interact with academics to provide information and assistance on the subject matter. Number of stakeholders in the public and private sector and NGOs' interest to cooperate with European Studies students, researchers and faculty members has been growing in the recent years.

4. European Studies at the University of Latvia

European Studies master`s programme at the University of Latvia was launched for the first time in 1996 in the frame of the Tempus project JEP-11389-96 (completed in 1999) in cooperation with University Libre de Bruxelles, University of Hull (UK), Universita degli studi di Genova (Italy), Universite de Droit,d Economie et des Sciences d'Aix-Marseille (France), Universidade Tecnica de Lisboa (Portugal). The main objective of the project was to create a two-year master programme in political science with a minor in European Studies at the Department of Political Science the University of Latvia. The project was focused on curriculum development, advanced studies and research at master and doctoral levels, student and staff mobility, as well as a library upgrading.

After Latvia expressed its wish to become a member of the European Union, the Jean Monnet Programme, supported by the European Commission, was of unique value in allowing Latvian scholars to continue education focused on European dimension in social sciences and to begin dialogue with their counterparts in different countries on common and fundamental issues for integration before accession to the EU.

During the pre-accession to the EU period different Jean Monnet grant schemes have been launched in the country. This was a starting point for an interdisciplinary approach to education, theoretical and applied research on the themes related to European integration. The Jean Monnet Programme was helpful in the development of human capital.

Since 2000 the Centre for European and Transition Studies (CETS) and European Studies master`s programme, successfully function at the University of Latvia. The master`s programme is incorporated at present within the

Faculty of Economics and Management. The aim of CETS and the master`s programme is to promote and support interdisciplinary studies, academic and applied research on European issues involving master and doctoral students from both European Union Member States and Third-Countries. The main focus of CETS encompasses research in economics, political science, law, public administration and regional policy issues. The CETS hosts Jean Monnet and Marie Curie projects and provides advice to public institutions on economic and social development in the context of European integration. When CETS was founded 10 years ago, its mission was to support education and provide research in the area of European and Transition Studies and to be a forum for interdisciplinary education and research licked to developments in the European Union and associated countries.

Today, the Centre is recognized internationally as an innovative institution in interdisciplinary studies in the Baltic States. CETS represents a forum for debate for academics, postgraduates and practitioners on current trends concerning European development as analyzed from the perspective of a New Member State.

The European Commission Jean Monnet Programme offers additional support to the Centre and to the European Studies master`s programme. The Jean Monnet Centre of Excellence was established at the University of Latvia with the support of the European Commission in 2011. Through the European Studies master`s programme and research projects, the Centre has regularly accepted interns from Canadian HEI (jointly with the Canadian embassy to the Baltic States) within the framework of the cooperation with the Canadian universities network for European Studies and European Union (Canadian) Study Tour and Internship programme (more information is provided in Chapter 3 of this book).

The European Studies master`s programme, as it was mentioned above, provides an interdisciplinary approach to an all-round high-level understanding of the evolution of modern Europe and of the European Union. The principal constituent disciplines are economics, law and political science and public administration with components from history, international relations, regional science and other relevant disciplines. Particular stress is laid to the deepening of integration process from the perspective of the New Member State. Students from EU Member States, i.e. Latvia, Lithuania, Poland, France, Cyprus, Germany, Italy, the Netherlands, as well as from the Third countries, i.e. Turkey, Azerbaijan, Georgia, Moldova and the US, have graduated from this European Studies MSc degree programme. Some of these students received support from the European Commission DG Education and Culture project: "Master Courses in European Integration Studies – Scholarships for ENP Countries and Russia", and the Faculty of Economics and Management.

To ensure for students a combination of theoretical knowledge gained with practical applications related to the issues discussed in classes about functions of the EU institutions a possibility to participate in a practical seminar week in Brussels and Luxemburg is offered to the European Studies students. This practical seminar covers visits to EU key institutions and NATO in Brussels,

and provides an opportunity to participate in discussions on current topics with experts. Briefings at the Court of Justice of the European Communities, EUROSTAT and DG for Translation in Luxemburg are also included in the study visit programme.

European Studies master`s programme at the University of Latvia is an example of successful implementation of the multi and interdisciplinary dimension on European matters. More than 500 graduates of the programme work in the EU, national public and private institutions. They serve as political, economic and legal advisors; work in diplomatic services, in the area of communication and international journalism.

5. Third Level Cycle in European Studies

As it was pointed out in European Subject Area Group (SAG) documents,[2] European Studies doctorate is desirable as generally there is not a Ph.D. cycle in European Studies and students have to study for doctorates in specific subjects. As the experience shows, many of European Studies master`s programme graduates continue their studies at the third level to embark on a career in academia.

The discussion should take place in academia at European level in general, and at the national level in particular, about the desirability of introducing European Studies Ph.D. However, there are many doctorates on topics within the field of European integration, drawing on more than one discipline. It is recommended by SAG to work on establishing a joint programme with two universities from different countries. Another requirement concerns compulsory for doctorate students to have a first or second level degree in European Studies. European Studies courses and programmes have been developed in Latvia predominantly at the second cycle level. However, in 2010 a Doctoral School for European Integration and Baltic Sea Region Studies (EIBSRS) was launched at the University of Latvia to support young scholars during their research training.[3] Most of doctoral student at the School gained "real" research experience by contributing to research projects implemented at the Centre for European and Transition Studies funded through the European Commission.

However, doctoral programmes retain the responsibility for academic admission of a Ph.D. proposal, regular doctoral studies and preparation of the Ph.D. thesis for its defence.

The School carries out activities related to the international dimension of the doctoral degree and helps to enhance the value of the doctoral degree on the labour market, in society and in the researcher's personal career. Research training at the school is associated with processes of deepening

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[2] Gonzales, J., Wagenaar, R. G. (eds.) (2008), "Reference Points for the Design and Delivery of Degree Programmes in European Studies", *Tuning Educational Structures in Europe*, Bilbao: Publicaciones de la Universidad de Deusto, p.43-44.

[3] University of Latvia, Doctoral School " European Integration and Baltic Sea Region Studies (EIBSRS). Available at: www.lu.lv/eng/istudents/doctoral/doctoral-schools/balticsearegion/

and widening of the integration in Europe. Special attention is given to deeper integration of Latvia and other Baltic countries in the EU, regional cooperation and development in the Baltic Sea area. Participation in the School activities helps doctoral students and Ph.D. candidates to improve skills in interdisciplinary and multidisciplinary research. The School cooperates with different research structures at the University of Latvia, other educational and research establishments in the country, partners from the EU and non-EU countries. This co-operation provides a solid platform for advanced studies that offer added value within and outside the discipline of a young researcher. Doctoral as well as master students from different subject areas and study programmes such as economics, law, politics, communication, management, culture, geography, European Studies and Baltic Sea Region Studies are welcome.

The Doctoral School organizes guest lectures, seminars, regular discussions and Jean Monnet doctoral colloquia, as a part of the European Commission project Jean Monnet Centre of Excellence at the University of Latvia and doctoral students' working groups to facilitate research-related activities. The School arranges information sessions, promotional events and interaction with industry, keeping abreast of the pulse of external stakeholders.

6. Tuning Methodology as a Platform for Further Enhansement of Competences and Skills

The European Studies programme at the University of Latvia together with other similar programmes of the EU HEI have been involved in the European Studies Subject area group (SAG) in the European Commission project: Tuning Educational Structures in Europe (Gonzales, Wagenaar 2005, p.93-98), which gives additional strength in expertise for successful teaching European Studies students at all three cycle levels in line with methodological approach of implementation of Bologna reforms. Since European Studies programmes are usually organised according to the main subjects of the faculty departments in which the programme is based, students should gain the "core" competences in any European Studies programme.

Common methodology developed by the European Studies SAG in relation to subject specific competences and the "core" competences is helping to establish an effective network among institutions providing European Studies programmes based on agreement on the core competences. One of the advantages of being aware of the "core" competences would maximise students' ability to move to another European university approaching the subject area from a particular specialization they wish to pursue. They would be able to do this in confidence that a period spent abroad would both achieve full recognition towards the degree award from their home university and that this degree would also enable them to move to another country to study at a higher level. Successful mobility will positively influence the individual competitiveness of students and will impact on the competitiveness of the higher education at the national and EU levels.

The SAG came to the conclusion that European Studies graduates gain in employability, since they are able to work in many different tasks, agencies and productive structures. European studies' graduates have by definition multi-disciplinary education and training, they mobile, flexible and highly competent human resources, "friendly" to the new structures of employment and economy in a constantly changing and challenging international socio-economic context. In addition, their competence in languages, strengthen their ability to work in a multicultural context.

7. Conclusion

Higher education and research in particular in social sciences are facing new challenges of more than ever integrated global world economy and must respond to the new processes that strengthen the mutual ties between national, regional and international communities. Interrelation and interaction of political, economic, social and other dimensions leads to the interdependence of studies and the demand for integrated programmes that offer an interdisciplinary approach to the development of generic and specific skills and competences.

Latvia has followed ambitious reforms based on the European Higher Educational Area objectives. One of the new dimensions in higher education and research is related to the focus on multi- and interdisciplinary programmes. The universities that have implemented European Studies courses and programmes have common characteristics, but still reflect national socio- economic and legal environments.

Developments in the European political, economic and social environment imply a growing demand for knowledge of EU economic, political and legal matters.

Establishment of European Studies programmes at a university level is an obvious strategy for the higher education institutions as this will give students an opportunity to acquire a solid knowledge about Europe and the European Union.

Implementation of European Studies programmes contributes to build a stimulating research environment; the development of the third cycle level in European Studies is highly recommended. Analytical skills for the graduate students and specialist knowledge promoted by European Studies are assets in areas, where profound knowledge of contemporary European Union matters is needed.

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Guna Japiņa

Interdisciplinary Approach in the EU Policy Making Processes: in Preparation of Latvia's Presidency of the EU Council

Abstract

The article aims to highlight today's cross-sectoral nature of the international and EU agenda, which is determined by global challenges, diversity of national interests and the complexity of EU negotiation processes. Interaction and overlapping of various policy areas characterizes EU initiatives and creates substantial and practical challenges for EU experts. The coordination system of EU affairs in Latvia ensures an institutional framework for the implementation of an inter-sectoral approach. At the same time for Latvia to become a more notable player in EU processes and to prepare itself successfully for the Presidency in the EU Council, this framework should be complemented by highly professional specialists. For this purpose, it is essential to create inter-disciplinary higher education programmes that would cover both the EU policies and decision-making procedures.

Keywords: cross-sectoral approach, interdisciplinary education, co-ordination of the EU affairs, Presidency at the EU Council.

1. Introduction

One of the founding fathers of the EU, Jean Monnet, predicted in 1954 by said, that: "Our countries have become too small for today's world, when compared to the potential of modern technical means and in relation to the dimension of America and Russia today, China and India tomorrow."[1] Along with the outset of the multipolar-world and the beginning of digital era, also globalization emerged, raising the questions about the role, importance and functions of a nation-state and the use of instruments that are at the disposal of each country, to ensure welfare and security of its society. Accordingly, from the position of Latvia, there came into the spotlight not only issues of Latvia's visibility, recognition and role in the international arena, but also of global challenges, risks and threats that cannot be avoided and increasingly affect the daily lives of Europeans.

While the world's leading powers still prefer bilateral dialogue with individual countries, legitimacy of power in EU Member States at the national level is often provided through international organizations. Also the EU responses

[1] Jean Monnet 1954. Available at: http://ec.europa.eu/ireland/newsletter/2011-sept-to-dec/newsletter-10-nov_en.htm

to today's challenges are being sought and produced jointly to bring them into the international arena as common positions that are coincident with Member States' and EU policies. An important role in quest for common responses belongs to the Presidency of the EU Council.

What are the global challenges that the EU will face? To what extent and how do they influence the agenda at EU and national level? What kinds of mechanisms are at countries disposal to respond to these challenges? And, finally Latvia will assume the Presidency in EU Council in 2015. What is needed for this honourable duty to be successfully performed?

2. Global Challenges as a Cross-sectoral Phenomenon

Today's challenges for the EU radically differ from the European Community's tasks several decades ago. In the foreground of the EU there are still issues of welfare, security and freedom for the EU citizens; however, this task has become much more complicated due to the international developments affecting EU policies. Even more - the EU agenda is under an increasing pressure to provide solutions for global challenges and respond to global developments.

First, the EU needs to position itself in response to the continuous processes and trends. For example, the forecast for economic development and political processes shows the tectonic change in Asia region. Rapid economic growth in China and India is based on significant investments in research and technology (European Commission, 2010). Turkey, as a member of NATO, could possibly develop as an example for other Middle East countries.[2] The prediction is that the Asian population by 2050 will increase by about 1 billion (from 4.2 billion in 2010 to 5.2 billion inhabitants in 2050), while the number of Europeans will shrink from 733 million to 691 million people. None of the world's 12 largest urban agglomerations will be located in Europe, while 9 of them will be located in the Middle and Far East, and in Africa (Borchert, 2011).

Major EU suppliers of fossil energy resources are located in Asia and North Africa, and several of them represent a threat to global stability. Energy consumption in the EU displays a negative trend, and a decrease of energy production in Europe means that by 2030 the import of oil and gas will need to grow up to 75% (EU Council, 2008).

Climate change has become a trump card in today's geopolitical agenda (Paskal, 2010), and, unlike *traditional* natural disasters, it can have serious consequences on locally, regionally, and globally and affect an unlimited number of people. Politically unstable and economically weak states are more vulnerable to climate change impacts and consequential risks. The shortage of resources (especially water) and energy, political radicalization, conflicts

[2] Turkey is viewed as an example for Arab countries by 82% of Turkey's population and 66% of population in the Arab world (Egypt, Lebanon, Saudi Arabia, Jordan, Syria, Iran, Iraq, Palestinian self-government). *Foreign Policy Perceptions in Turkey*, TESEV Publications, 2011; *The Perception of Turkey in the Middle East,* TESEV Publications, 2011.

and migration (EU High Representative J.Solana Madariaga and European Commission, 2008), impose new obligations not only for climate mitigation, but also to settle crisis, combat illegal migration and crime, and to ensure social security and cohesion. Climate change also affects the EU region; as a result, the need to deal with this challenge appropriately in the EU Cohesion and Common Agricultural Policies arises.

Similarly, global and EU agendas are increasingly affected by emergent political developments. The political unrest that started in North Africa and the Middle East in beginning of 2011 has brought to the forefront of EU debates a wide range of problems related to migration issues, ranging from the traditional *burden-sharing* issue to the reintroduction of border control in the Schengen area, which in fact threatens European common and deeply-rooted values.

Also, global economic and financial crisis management is considered a short-term task (European Commission, 2010). This is addressed in several manners: efforts to ensure stability of the euro zone, EU Member States' supervisory mechanism for balanced economic development, discussions on tax on financial transactions, etc. At the same time, crisis has forced the EU to appreciate the significance of responsible and sustainable policies in virtually all activities.

The transformation has taken place also within the scope of actors in the international arena. Along with the countries, non-governmental organizations, political parties and interest groups also take part in the processes, forming a barely transparent network of information, contacts and interests. A new player in the field is organizations which subsist on conflicts and whose main interest is an access to resources. The nature of conflicts affecting the international situation has changed since armed clashes are often replaced by intimidation policy. Moreover, in addition to known factors any process is affected also by the yet *Unknown Unknowns;* what must be taken into account when searching for effective solutions (Borchert, 2011)?

Simultaneously, these threats and risks would not be so important if globalization had not created an enormous range of opportunities for individuals and businesses. Therefore, one can argue that both states and society in general have become more vulnerable (Münkler, 2011), while the solutions need to be more efficient and faster than before. The key questions that have to be addressed at the international and national level are – access to resources, income distribution and solidarity – the concepts that are also on the agenda within EU internal debates.

3. EU Policy Making as a Cross-sectoral Process-Institutional Tool

Institutionally a direct response to today's challenges is the Lisbon Treaty, which aims to make Europe more visible and prominent in the world, provides security to EU citizens and ensures that the advantages of the EU internal market can be used to full extent. Although the Treaty came into force recently, on 1 December 2009, ambiguity and scepticism regarding the implementation

of the progressive changes stipulated by the Treaty is prevalent. The EU resources are limited, therefore prioritization and networked cooperation both within the EU and between the EU and international organizations and third countries is particularly important. Another aspect that underpins the need for an integrated approach is communication with EU citizens, which should cover all areas of EU activities to ensure the legitimacy of the EU Member States' ambitious decisions and thus foster their implementation.

The EU itself is also a global player and its mandate is limited by the national interests of the Member States. The aim of EU external action, int. al. is protection of its values, interests and security. This purpose is also served by other EU external actions, including strengthening of democracy, rule of law, human rights and principles of international law, peace-keeping and conflict prevention, fostering the development of developing countries to eradicate the poverty, encouraging the integration of all countries into the world economy, development of international measures to preserve the quality of the environment and ensure the sustainable development, disaster relief, and, finally, the promotion of an international system based on stronger multilateral cooperation and good global governance (The EU Treaty, Article 21).

The provisions of the EU founding treaties on internal market principles, consumer protection, Common Agricultural Policy, Cohesion Policy and other issues that most directly affect the daily lives of Europeans – are and remain the centre of attention of the EU citizens and governments. In order that the EU efforts are better focused to achieve the identified objectives and involve particular stake-holders, new horizontal policies and initiatives are defined, such as the EU Sustainable Development, Regional Strategies, Integrated Maritime Policy, etc. However, it is important to acknowledge that today there is no longer any EU policy or area of action that is not affected by global trends.

For the EU to be able to appropriately respond to these *external stimuli*, its approach and policies must be united. To this end, in the EU internal policy-making is actually applied the principle loaned from EU Development policy, i.e., principle of policy coherence for development.[3]

Random comparison of the risk and the range of the course of actions, as outlined in the Review of European Security Strategy (EU Council, 2008), the EU Internal security strategy (EU Council, 2010), the updated EU Sustainable Development Strategy Report (European Commission, 2009) shows that they largely overlap and coincide (see Figure 1). Such practice is also confirmed by the documents of the EU internal commitments, such as *EUROPE 2020. A strategy for smart, sustainable and inclusive growth*, where one of the priorities is sustainable development and the Commission's vision on EU transition towards a low carbon emission economy (European Commission, 2011). Moreover, on reviewing the EU Sustainable Development Strategy, the

[3] Andris Piebalgs, EU Commissioner for Development Cooperation. *European Development Co-operation in Times of Global Change* – lecture at the University of Latvia on 18 March 2011, Journal *Latvijas intereses Eiropas Savienībā*, 2011, No.1.

Commission concludes that integration of the sustainability dimension into other EU policy areas so far has not been sufficient and there is a need for greater linkage and coordination among relevant policy areas, implementation of the measures within the framework of these policies, as well as a need for specific indicators for monitoring its implementation in the Member States. By contrast, the transition to a low carbon economy, prudent use of natural resources, security of energy supplies, promotion of social inclusion and sustainability of public finances are fields that deserves more particular and close attention in future. The Europe 2020 Strategy illustrates EU efforts to become more competitive in the world market, to overcome economic and financial crisis and to prevent the recurrence of similar scenarios, as well as to promote social inclusion and provide EU contribution in combating climate change. However, EU internal objectives can be achieved only in close cooperation with international partners, forming a part of the Common foreign and security policy agenda.

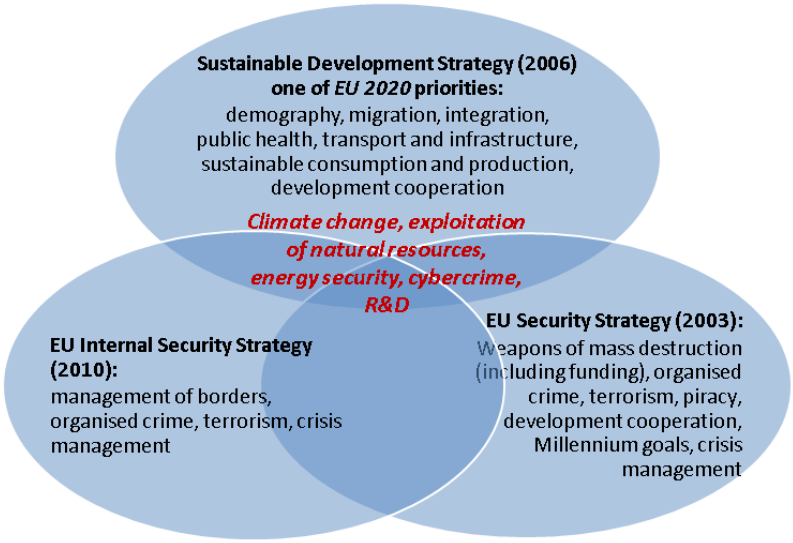

Figure 1. EU Objectives
Source: EU Council, European Commission

To ensure a coherent cross-sectoral response, the EU possesses a relatively wide freedom of action and customized methods. Unlike other organizations, the EU inherits delegated national sovereignty, a wide range of instruments, including legally binding ones and a precise mechanism for development, implementation and control of these instruments (Ministry of Foreign Affairs of the Republic of Latvia (RL), 2010).

The EU strategic objectives at the working level dissolve into separate sectors operated by the European Commission (EC) services and expert groups, EU agencies, more than 200 EU expert working groups and 10 sectoral ministerial formations, heads of states and government, the European Parliament (EP)

committees and plenary sessions, at the same time maintaining contacts with international partners.[4] If an issue relates to a number of Council of Ministers' formations or expert working groups, it is relegated to all the relevant formations. The Lisbon Treaty has made the General Affairs Council as a separate political format; it prepares the European Council meetings, as well as deals with EU issues that affect several policy areas or fields, for example, such as the EU Enlargement, the EU Sustainable Development, strategic issues of climate change policy, Europe 2020 Strategy, Regional Strategies, etc.

In daily work, such a networked approach creates challenges in terms of substance and also institutional challenges. For example, discussions on a new EU budget for 2014-2020, encompass parallel debates on a) the review of multi-annual budgetary structure and priorities, b) future of Cohesion Policy, c) Common Agricultural Policy after 2013, as these two policies are the financially most capacious EU Policies, as well as d) on the need to allocate sufficient resources for the implementation of the Common Foreign and Security Policy. Due to the horizontal nature of EU issues disagreements can arise about policy area the issue belongs, the extent the boundaries between the policies that unite different courses of action can best be delineated by a doctrine (Ozolina, 2011).

The EP is giving an increasing contribution to the EU policy-making and ensures the legitimacy of the EU. The EP is the only EU institution elected by EU citizens and so broadly opened to various interest groups. The Lisbon Treaty gives the EP the right to decide on the European Commission's proposals on an equal footing with the EU Council on approximately 2/3 of the issues. Although, in most areas the EU legislative initiative belongs to the EC, it quite often comes up with new initiatives on the invitation of the EP. Often the EP is the EU institution that reacts the most quickly to international developments. All budget allocations are approved by the EP. When deciding on the annual EU budget, but especially on the multi-annual budget framework, the EP uses the opportunity to influence the EU policies' and long-term priorities.

An important tool for implementing the cross-sectoral approach is the impact assessment of Commissions proposals. The system was launched in 1986, but has developed rapidly. Impact assessment is now covering the analysis of the economic, environmental and social aspects of any new Commission's initiative, which creates such an effects, regardless of whether it is a proposal for EU legislation or a legally non-binding document (for example, White Paper) (Cecot, Hahn, Renda, Schrefler, 2008, p.407). Impact assessments are carried according to EC Impact Assessment guidelines (European Commission, 2009) and in collaboration with the Independent Impact Assessment Board

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[4] For example, in maritime policies, which combine fisheries, marine environmental protection, transport and logistics, energy, tourism and coastal development the responsibility is shared of at least 15 Commission Directorates General, 6 EU agencies and 5 international organizations; see Borchert, H., (2011), *Maritime Sicherheit. Akteure, Handelswege und Risiken* – Seminar für Sicherheitspolitik, Berlin, Germany.

that was established in 2006 (European Commission, 2006) , which controls the quality of impact assessment. In its impact assessment the Commission applies a multistage approach and carries out data analysis of different levels and *depth,* depending on amplitude of the identified potential impact or effects. An integral part of the EC impact assessment is also identification of alternative actions (policy responses) (European Commission, 2009). The Commission prepares action plans marking the performed analyses and those that are planned for the future.

Thus, impact assessments have become an integral part of the EU policy making process that helps to improve the quality of EU legislation, int.al. making it simpler, more efficient and business friendly. Impact assessments are recognized as EU good practice also at the international level.[5] Along with impact assessment for new initiatives, the Commission intends to draw attention also to evaluation of the existing legislation and policies that will serve as basis for elaboration of new or revised legislation proposals.

Currently, the primary responsibility for carrying out impact assessments rests with the Commission as the initiator of the EU legislation. At the same time, the last decade has shown that it should be also applied to the EU Council and the Parliament. Each institution should be responsible for the evaluation of its proposals and the choice of methods according to which the evaluation should be carried out (European Parliament, EU Council, European Commission, 2005). The last EU Presidency countries have actively worked ensure the use of the impact assessment becomes a common practice of the EU Council working groups, where expert debates on EU legislation proposals and initiatives takes place. In 2006, during the Austrian Presidency Indicative Guidelines on the impact assessment were designed especially for the EU Council working group chairs (EU Council, 2007). The principle of shared responsibility is also highlighted in the European Court of Auditors report of 2010 (European Court of Auditors, 2011).

An increasing role in the evaluation of new initiatives gains the NGO sector, or the immediate addressees and enforcers of the emerging EU legislation. Along with the impact assessments, there are also other elements of the Better Regulation, such as public consultations on EU initiatives. In consultations any interest group or even individuals may participate. The meetings are held in all official EU languages and the time allocated for public debates on newly published initiatives from 2012 have been extended from 8 weeks to 12 weeks (European Commission, 2010).

Although global challenges increasingly affect EU policies, the EU contribution to international discussions must comply with the mandate given by the Member States. This task is feasible by using an integrated and comprehensive approach, comprising a number of EU policies; in this way, interdisciplinary approach is used in both, at the EU and the national policy-making level (see Figure 2). At the institutional level, it manifests as close

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[5] European Commission press release 28.09.2010 IP/10/1187 and EU Court of Auditors report *Impact Assessments in the EU Institutions: do they support decision-making?* Available at: http://ec.europa.eu/governance/impact/key_docs/key_docs_en.htm

cooperation between the EU institutions, between the Member States as well as among EU institutions and Member States accordingly to the official EU decision-making procedures and informal practices.

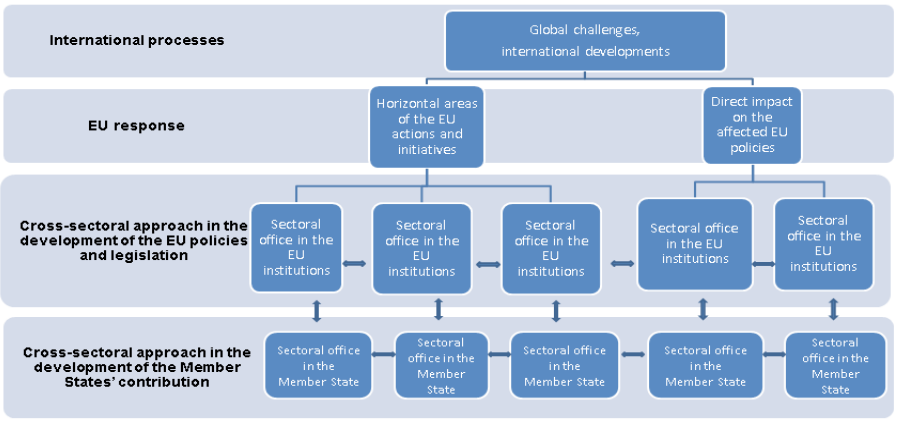

Figure 2. Cooperation between EU institutions and Member States

Source: elaborated by the author

4. Cross-sectoral Approach in the EU Affairs Coordination System in Latvia

A cross-sectoral approach to deal with the EU issues in Latvia was established in 2003, when Latvia became an observer in the EU decision-making process (Cabinet of Ministers RL, 2003). By that time national regulations and institutional framework was revised and supplemented in accordance with the EU procedures and taking into account the analysis of both domestic experience and that of other Member States (Cabinet of Ministers RL, 2005). The current co-operation arrangement for the engaged institutions and interest groups is a compromise among the state administration, the Saeima (National Parliament) and the non-governmental sector, and it establishes the procedures of preparation and expression of Latvia's opinion on EU issues, as well as regulates EU related information flow arrangements (Cabinet of Ministers RL, 2009).[6] The system is based on inter-institutional dialogue, clear division of competences and responsibilities and flexible principles that

[6] Currently in force are the Cabinet of Ministers 03.02.2009 Regulations No.96 "Procedures, by which the national position of the Republic of Latvia shall be developed, harmonised, approved and updated in matters of the European Union" and the Cabinet of Ministers 03.02.2009 Instruction No.4 "Procedures, by which the national position of the Republic of Latvia and the related instructions shall be developed and information circulated". Certain elements of the coordination system are included in the Saeima Rules of Procedure, the State Administration Structure Law, the Cabinet of Ministers Structure Law, the Cabinet Rules of Procedure, as well as in the institutional regulations and the internal procedures of individual ministries for coordination of the EU issues.

allows adapting to the changing EU schedule. In this context, a number of tools should be highlighted particularly.

A key document to formulate and express Latvia's interests in the EU negotiations is the national position. Just like the Commission does impact assessments on its newly-proposed initiatives, analysis of potential impacts of the respective proposal on Latvia should be carried out within the framework of the national position. It is essential that such an analysis is carried out on all the issues on the agenda of the European Council, the Council of Ministers, the EU Council working groups and committees, without confining solely to the EU legislation drafts. It allows to influence the EU policy decisions and their course from the very beginning i.e., in their early stages of development. Regulations do not specify what type of the information this impact assessment should contain. However, in practice attention is paid to have both descriptive and analytical information regarding the impact of the new EU initiative on the respective area and on the existing Latvian legislation in this jurisdiction. Particular attention should be paid to the possible impact on other related sectors.

Yet another issue is the impact of the EU initiative on the state and municipal budgets. An arguable issue is the degree of accuracy and detail when indicating the eventual fiscal impact of the initiative, since the calculations performed at this early stage may prove to be imprecise due to the changes introduced during the EU decision-making process. However, it is important to recognize that the fiscal impact must be considered in close conjunction with the opportunities offered by the initiative, the fiscal benefits of which can be calculated only in the medium-term or even later, or only in the terms of the overall public benefit.

Fiscal effects depend on the proposals expressed in the course of the initiative that quite often introduce significant changes in the content of the initiative. Therefore, before deciding in favour of one or another proposal, it would be necessary to analyze also its fiscal impact.

The aim of elaboration of the national position is to ensure that Latvia's interests are recognized and taken into account in all EU decision – making stages: in initiation, deliberation and adoption (Cabinet of Ministers LR, 2009, Article 2); that is why Latvia's opinion on any EU issue in the EU negotiation process should be based on the evaluation results. The more precisely and earlier the initiative's impact on Latvia is identified, the less difficulties and unexpected developments will arise in further EU discussions and also at the national level.

The most important coordination mechanism through which the implementation of inter-institutional cooperation is realized is inter-institutional working groups, which are established either with a decree of public official or formed during the working process, and also the Meeting of Senior Officials (SOM) on the EU issues, which since its foundation in 1998 has experienced significant changes. SOM has become the format for the preparation and coordination of Latvia's opinion for the debates in the EU decision initiation, preparation and adoption processes, and focuses on most

important cross-sectoral issues and on the identification of potential risks in ongoing and also forthcoming EU debates.

From the inter-ministerial format the SOM, similarly as inter-ministerial working groups, has become a format that is open to the partners that can be qualified as other stake-holders. SOM includes representatives from the National Tripartite Cooperation Council and the Latvian Association of Local Governments, and any interest-group can propose matters for the debates and also participate in the SOM (Cabinet of Ministers RL, 2009, Article 19). Also, a representative form national parliament participates in the SOM.

SOM examines and holds debates on the draft of national position, if:

- the subject matter (EU issue) is a competence of several institutions, or
- it significantly affects Latvia's interests, or
- during the drafting of the national position the involved institutions cannot find agreement on issues related to the national position.

SOM also decides on the submission of EU issues/national positions to Meeting of State Secretaries or the Cabinet of Ministers. Meanwhile, the national position may also be submitted to the Cabinet of Ministers in other cases, for example, if the responsible authority or authority which shares responsibility for the particular EU issue, considers it as necessary (Cabinet of Ministers RL, 2009, Article 20).

Up to now the role of national parliaments in the EU debates in most cases has been formal due to very dynamic nature of EU matters and a considerable amount of information, as well as specific character of the questions and the dominant nature of the executive power (Kassim, 2003, p.96). However, the role of the Saeima, compared to 2004, has significantly increased. The Saeima European Affairs Committee is authorized to represent the Saeima`s opinion on the EU matters,[7] yet in practice increasingly more questions are also examined by sectoral commissions. The deliberation of EU issues within the framework of Foreign Policy debates has actually for the first time opened an opportunity to discuss EU issues also at the Saeima plenary sessions.[8] The Saeima authority in the EU debates has been also broadened by the Lisbon Treaty (Liegis, Ostrovskis, 2011).

With the entry into force of the new law, the legal basis established a new approach: if there is no policy framework, priorities and targets for development, courses of action, main tasks or results to be achieved that is approved by the government and concerns the respective EU issue, the national position can temporarily replace the corresponding policy planning documents (Parliament of the Republic of Latvia, 2008, Article 11, paragraph 8 and Cabinet of Ministers RL, 2009, Article 3). To consider that EU policies develop faster than the national policy planning documents are able to adjust, this provision legalizes already established practise, where the primary responsibility rests on the experts. At the same time, the trust that in this case is granted to the national position is an additional tool, which ought to

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[7] Rules of Procedure of the Saeima, 2011, Article 185^3.

[8] Rules of Procedure of the Saeima, 2011, Article 118^3.

stimulate that in the course of elaboration and approval of national position to Latvia's opinion and argumentations receive particular attention.

Overall, the coordination system of EU affairs in Latvia can be described as institutionally clearly defined: formal processes which have been implemented by the help of informal co-operation and contacts; accurate coordination replenished with reliance on line ministries and involvement of civil society (Svendsena, 2004). It properly responds to ongoing processes within the EU and actual EU agenda. Latvia's performance among the new Member States is estimated as average (Akule, 2009), but in some areas, for example such as EU multi-annual budget, agriculture and environment, Latvia can be positioned among the EU policy drivers. Assessing the extent to which a favourable outcome for Latvia has been reached on those EU issues that are prior to Latvia, it appears that virtually all major EU decisions adopted from 2004-2010 do not baldly contradict with Latvia's interests and the integration of Latvia's interests in them ranges from thorough to uttermost maximum. It should be noted that the list of nationally most important EU issues has been defined for every EU Presidency (every 6 months) and approved by the Cabinet of Ministers and the Saeima.

Meanwhile, the daily work with the EU issues directly depends on the state administration capacity and experience and professionalism of its employees. Any success can be achieved only when the established mechanism is filled with expertise and a proactive behaviour at the level of experts, but also – at senior officials and politicians.

Usually work with the EU matters implies simultaneous monitoring of several tens of EU issues, swift action and tackling tactical problems with different institutions as well as with other countries. It is substantial that approximately 80% of all EU decisions made by the Member States are basically taken at the level of experts, delegating to other higher authorities just a formal approval. Therefore, anyone who deals with EU issues, should be acquainted with the lengthy and institutionally complex nature of EU decision-making process, that manifests itself in a continuous search for a compromise among the 27 Member States, each of which has a different number of votes, and the compromise which is acceptable not only to the EU Council, but also to the Commission and the Parliament.

For this purpose, it is essential not only to identify the interests of the respective field or policy area to which the EU issue belongs, but also to contemplate its interaction with other sectors, regardless whether they represent complementing or competing sectors. Also, it is crucial to assess the weight of the particular EU issue within the hierarchy of the EU policies and decisions, as well as to examine and assess all the possible options for the best compromise, both at the national and EU level. Belonging to a particular region, active participation in different regional formats or reliance on like-minded countries does not, unfortunately, guarantee the best results for Latvia due to the different national political situations and economic needs of Member States. Similarly, the excellent expertise will remain unheard and unnoticed, if there are no skills to persuade those who hold other opinions, by using both formal and informal contacts and other information channels.

Such knowledge, skills and understanding constitutes a 'minimum" for every Member State to lobby its interests in Brussels' and Strasbourg's meeting rooms and corridors. Along with the tailor-made national coordination procedures, the expertise and knowledge on EU issues and decision-making procedures help to ensure that EU decisions are compatible with the national interests. Meanwhile, the Presidency in the EU Council poses additional tasks for the Member State.

5. Working with the EU Issues as a Presiding Country

Traditionally, the Presidency of the EU Council implies an opportunity to influence an EU agenda and decisions, by setting the Presidency country in the centre of EU legislation and negotiations (Elgström, 2003). Besides huge logistic challenges that arise in the preparations for EU Member State meetings, both at the highest and experts' level, it is essential to understand the Presidency's responsibilities in terms of the content.

First of all, the EU Member State which holds the Presidency possesses the privilege of being in the centre of information confluence, having full control over the progress of EU issues, as well as having the right to suggest or approve compromises which go beyond the borders of one area of action (Tallberg, 2004). The Presidency faces an increased number of national players, as well as partners in other Member States, the EU institutions (the Commission, the Parliament, the European Office of the President and the European External Action Service) in third countries and international organizations.

However, the Presidency's objectives and priorities are to a large extent limited by the obligation to push forward the pending EU issues, particularly those who, under the EU treaties have clear deadlines for progress. Basically, it refers to the issues which are considered under the ordinary legislative procedure. These issues do not always fall within the area where the Presidency has a strong expertise or interest to set it as a Presidency's priority. Accordingly, the result of the Presidency's efforts is not necessarily dependent on its determination and capacity, but to a large extent also on other players' positions, which are not always possible to handle in the Council so that the compromise would be acceptable also to the Commission.

In addition, the EU decision-making process rarely covers only the term of one Presidency. Therefore, the EU's decisions, with few exceptions, may be considered as a collective performance of successive Presidencies, where a decision is being prepared by one Presidency, while another one concludes the debates.

The Lisbon Treaty enforces the Trio Presidency *de jure* and the Trio Presidency works together to implement a joint 18-month working programme.[9] Such an arrangement provides the necessity for closer co-operation within the

[9] Declarations, adopted in the Final Act of the Intergovernmental Conference and annexed to the Treaty of Lisbon, signed on 13 December 2007. The Declaration annexed to the Treaty of Lisbon on Article 16 Para 9 of the Treaty on the European Union concerning the European Council decision on the Council Presidency.

Trio, where all three countries, despite the national priorities, focuses on a compromise that is acceptable for all of them.

The Treaty of Lisbon, too, introduces changes in competences of the Presidency, entrusting the preparation works and chairing of External Relations Council to the EU High Representative for Foreign Affairs and Security Policy[10] and the preparation and chairing of the European Council to the president of the European Council.[11] The Presidency has also lost an opportunity to come up – internationally and publicly – with most visible and substantial EU issues, as well as to steer the EU relations with the third countries, including, during the times of international crisis, what so far has been a momentum for the Presidency to assume a role of visible leadership. Thus, it appears that the Lisbon Treaty has not only reduced the prestige of the Presidency, but also relieved the Presidency of some of its responsibilities (Mazzucelli, 2008).

However, it is important to emphasize several aspects indicating the still significant and irreplaceable role of Presidency within EU processes. First, the agenda and the work of EU Council are prepared by Council of General Affairs that is led by the Presidency. The Council of General Affairs works not only with the agenda of EU Council, but – along with the relevant sectoral ministerial councils – also with all the essential cross-sectoral issues (see above). Second, the Council`s of General Affairs and the EU Council`s work results to a large extent depend on the work done by the ministers' meetings and the preparatory working groups, which again is led by the Presidency, except for the Foreign Affairs Council. Third, the President of EU Council and, in particular, the High Representative can perform their functions only if there is a close, purposeful and institutionalized cooperation with bodies led by Presidency. Fourth, the relative reduction of the Presidency`s competences forces it to search for new opportunities to increase its visual range regardless of the specific issues Presidency is interested and expertises in. Limited capacity, visibility and impact of small countries` Presidencies are objective factors which burdens the respective Presidency's initiatives and achievement of results concerning internationally important issues. Therefore, leaving certain questions to the President of EU Council and the High Representative allows focusing on other areas. And finally, preserving the Presidency as visible and operative as possible is also an interest of the Presidency itself, because it is one of the main symbols of joint and shared responsibilities for the managing of the EU (Mazzucelli, 2008).

The Presidency is not only a strategist, but also a fair negotiator. This argument is useful to partly solve domestic political disputes during the Presidency and to create a unique sense of Presidency's mission within the community, which is important in the circumstance of prevailing euro-sceptic attitude in Latvian society. At the same time the integration of the national interests of the Presidency-country in 'compromise proposals' is not a secret. From two possible compromises the Presidency will choose the one that is closer to its

[10] The Treaty on the European Union, Article 18.

[11] Ibid, Article 15.

own interests (Tallberg, 2004). During the preparatory stage of the Presidency, when forthcoming Presidency-country considers the potential development scenarios for every issue in EU agenda, allies are being sought. At the same time, for the Presidency to be considered as successful, it is essential that the Presidency is constructive, fair and demonstrates unbiased attitude towards the negotiation partners, realistic targets, preparedness in case of unexpected turns, well-considered rhetoric, carries out an open working manner when possible and, where possible, satisfies the needs of every Member State.[12]

At the national level, it is important that inter-institutional co-operation arrangements are adapted according to the Presidency needs. Ordinary mechanisms that serve the needs of Member States are not appropriate for the Presidency due to the excessive formalization, excessively long terms and insufficiently flexible negotiating mandate. Therefore, for the needs of the Presidency there should be a prompt exchange of information and a single message transfer ensured, as well as fairly open mandate for the EU Council meetings, which corresponds to actual progress in the negotiations. The Presidency should be well informed on the latest developments in the Member States, international organizations and third countries. These tasks are to be carried out only in close cooperation among all parties involved in the Presidency's activities. Taking into account the real capabilities and resources, it is worth considering the approach of Scandinavian countries. In these countries each issue was assigned to one particular expert during the entire Presidency. This approach allowed leaving daily operations for the lower institutional level where, at the same time, experts have higher level of expertise.

Latvia has successfully launched the preparations for the Presidency of the EU Council that will take place in the first half of 2015.[13] The experience of other Member States in preparations and running the Presidency has already been collected and aggregated. Being aware of the Presidency's workload and responsibility, Latvia is obliged to engage in the EU affairs knowledgeable and professional experts, whose performance then will largely determine the success rate of Latvian Presidency.

The greatest load and the responsibility will lay on the line ministries, who will be responsible for the contribution in the 18-month Trio Presidency working programme, implementation of the programme, preparation and chairing of the EU Council working groups and ministerial-level meetings, development

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[12] See the assessment of the Czech and Swedish presidency, Budde, A., *Zuverlässig wie ein Dieselmotor von Volvo*, Tagesschau, 30.12.2009. Available at:http://www.tagesschau.de/ausland/ratspraesidentschaft102.html; Rettman, A., *Czech presidency limps off EU stage*: http://euobserver.com/9/28398; Assessment of the Czech presidency by Greenpeace: http://www.greenpeace.org/raw/content/eu-unit/press-centre/policy-papers-briefings/evaluation-czech-presidency-09-06-29.pdf

[13] 15.12.2009 Informative Report and action plan "On Latvia's preparation for the Presidency of the Council of the EU in 2015." (Cabinet of Ministers Report RL No.88, §121). The report on the accomplished tasks as well as new ones is outlined in the Informative Report "On Latvia's preparation for the Presidency of the Council of the EU. The work accomplished in 2010", approved by the Cabinet 15.02.2011 (Cabinet of Ministers Report RL No.10, §57). The data in this part of the article and the time schedule derive from these reports.

of the agenda for these meetings as well as the substantive preparation of the meetings. To implement the Presidency's working programme, along with working group chairs and their deputies, an appropriate number of EU experts should be prepared. The Member States' experience proves that about 1,200 experts, covering various fields, for example, such as international trade, veterinary practice, statistics, electronic communication and many others, should be prepared and involved in the Presidency's work to enforce the content of its working program. There must not only be experts in their speciality, but also be able to distinguish and analyze the interrelationships with other, sometimes indirectly related, fields. The more complex and horizontal the presented initiatives become, the greater there is a need for the experts' faculty to look beyond his/her direct field of responsibility. In addition, it is vital not to get confused in the jungles of the EU decision-making process, but to manage and run them freely.

Currently, participation of Latvian experts in the EU Council working groups does not provide them with sufficient skills; to chair these working groups Latvian experts should have additional training. According to practice of other EU Member States, till November 2012, Latvia should nominate all the leaders/chairs of the EU Council working groups, by March 2012 the training programme to ensure the Presidency's work must be elaborated and submitted to the Cabinet of Ministers. Meanwhile, the training of the personnel involved in the Presidency will be carried out in 2013-2014. Thus, Latvia still has enough time to organize training in the areas, necessary for the preparation and conduction of the Presidency. These fields are - English and French at the highest level, the EU institutions and their functioning, the EU decision-making procedures, Rules of Council Procedures, negotiating tactics, drafting of EU documents in foreign languages. For the EU Member State that undertakes the tasks presented by the Presidency for the first time, proper training of the personnel is one of the biggest challenges, which in Latvia's case would be particularly critical due to the high rotation of the staff in public administration.

At the same time, a successful Presidency is not feasible without quality contacts at the EU institutions (network of national experts working in the Commission, which due to the budgetary consolidation measures still is an unexploited opportunity) and in Member States (secondment of national experts to administrations of other EU Presidencies). Frequently EU Member States holding the EU Presidency need to attract non-governmental professionals, particularly in the areas where the Presidency expertise needs to be strengthened.

6. Conclusions

Today, the cross-sectoral approach has become a major prerequisite, challenge and opportunity in dealing with EU matters. The EU has a wide range of tools to respond to rapidly changing environment so as to properly influence all involved authorities, interest groups and areas for action. To use these tools, it requires an understanding at first on the causation within and among the processes, as well as it requires knowledge and awareness

about the latest developments and trends, otherwise it is difficult or even impossible to formulate adequate national interests within the EU discussions. Approximately 80% of national legislations derive from the EU-level decisions (Hix, 2005, p.3), therefore successful membership in the EU means not just self-defence against what is supposed to be unacceptable, but also ability to exploit the situation for the self- benefit in the medium and long term.

Latvia is interested in a strong EU and in the smooth functioning of the EU. The changes introduced by the Treaty of Lisbon relieve the Presidency from coordinating the EU external relations function. However, an increasingly important challenge for the Presidency is to provide a greater synergy among the EU policies.

Latvian experts who are working with EU issues are now only partially able to cope with it. So far, the *Brussels lobbying* skills have been acquired through practice, self-taught or by attending training sessions. While preparing for the Latvian Presidency, a new approach should be introduced – a comprehensive and sound interdisciplinary education programme, offering both academic knowledge and developing practical skills. It should cover the history and content of EU Policies, their interaction and new trends, EU decision-making procedures, formal and informal approaches of lobbying national interests in Brussels and EU Member States, as well as negotiating skills and knowledge of EU languages.

Studies of the EU strategic documents reveal a timetable for forthcoming activities and it is possible already to note some of the items that will be in agenda in the Latvian Presidency in the first half of 2015: review of the UN Millennium Development Goals, preparation of Action Plan for the new multi-annual programme in Justice and Home Affairs, Report on the EU Strategy for the Baltic Sea Region, the mid-term evaluation of Europe 2020 Strategy, review of the Single Market package, etc.[14] Such an ambitious and strategically important EU agenda, embracing a range of EU fields of action is a great credit of trust for Latvia's Presidency, which can be delivered only when there is a professional team and excellent inter-institutional and trans-national co-ordination. Function and co-operation of Latvian institutions have to become more oriented to EU common interests, values and goals.

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Manfred J. Holler*

The Two-dimensional Model of Jury Decision Making

Abstract

This paper discusses a two-dimensional jury model. It combines the idea of winning a maximum of votes in a voting game with utility maximization that derives from the winning proposition. The model assumes a first mover, the plaintiff, and a second-mover, the counsel of the defendant. Typically, these agents represent parties that have conflicting interests. Here they face a jury that consists of three groups of voters such that no single group has a majority of votes. Each group is characterized by homogeneous preferences on three alternatives that describe the possible outcomes. The outcome is selected by a simple majority of the jury members. The agents are interested in both gaining the support of a majority of jury members and seeing their preferred alternative selected as outcome. It will be demonstrated that equilibrium decision making can be derived for this model.

Keywords: Condorcet's Jury Theorem, Voting Paradox, majority cycle, aggregation of preferences, agenda setting, collective decision making.

1. Introduction

Condorcet's Jury Theorem says that (i) any jury of odd number of jurors is more likely to select the correct alternative than any single juror; and (ii) this likelihood becomes a certainty as the size of the jury tends to infinity. The theorem holds if (a) the jury N decides between two alternatives by voting under simple majority rule; (b) each juror *i* has a probability $p_i > ½$ to be correct; (c) $p = p_i$ for all *i* in N; and (d) each juror *i* decides independently (Boland, 1989; and Grofman et al., 1983).[1]

Unfortunately, these four assumptions hardly ever (or, most likely, never) hold in reality and therefore increasing the number of jury members is not always a reliable instrument to come closer to the truth. As demonstrated by Kaniovski and Zaigraev (2011), the optimal jury size may in fact be a single juror if simple majority rule applies, all jurors are equally competent, but competence is low, and correlation between the jurors is high. Still, the Jury Theorem is well known among scholars of Law and Economics and references are ubiquitous. What is less known is that Condorcet tried

* The article is an "ongoing" publication.

[1] For Condorcet's text see « Essai sur l'application de l'analyse à la probabilité des décisions rendues à la pluralité des voix » (Paris 1785, pp. 119-136). Section 11 in "The Political Theory of Condorcet". Translated by Fiona Sommerlad and Ian McLean (manuscript 1989).

to extend his probability approach to the aggregation of preferences, and failed.[2] However, this experiment left us with the Voting Paradox, Condorcet's second outstanding contribution. It did not only inspire Arrow (1963 [1951]) to write his *Social Choice and Individual Values*, but also triggered earlier work that is the core of this paper (Holler, 1980, 1982).

In principle, aggregation of preferences is not about finding some truth, but about summarizing the evaluation of feasible or available alternatives, such as social states. Therefore, the Jury Theorem does not apply and its probability calculation seems, at least at the first glance, to be vacuous. Black (1963, p.163) concludes "whether there be much or little to be said in favour of a theory of juries" that refers to probability calculation, "there seems to be nothing in favour of a theory of elections that adopts this approach." He adds "…the phrase 'the probability of the correctness of a voter's opinion' seems to be without definite meaning." However, Arrow (1963 [1951], p.85) gives a somewhat surprising interpretation of Rousseau's *volonté générale* and voting: "Voting, from this point of view, is not a device whereby each individual expresses his personal interests, but rather where each individual gives his opinion of the general will." And he concludes that this "model has much in common with the statistical problem of pooling the opinion of a group of experts to arrive at a best judgement…"[3]

This could be interpreted as a justification of using juries of experts to choose the winner in competitions in the fields of arts and sports. However, legal judgements are not always about finding or defining the truth. Often they are about what is good or bad, about the degrees of the goodness and badness of the alternatives to be judged, or what should be done and what should be omitted. Almost every member of the corresponding society is considered an expert in this field, although it cannot be denied that some justification for this can be found in the argument that relates Rousseau's *volonté générale* to voting.

Judgements on values presuppose the existence of a scale of values, i.e., a social welfare function, or a mechanism that brings about an evaluation scale or the choice of a particular alternative. A jury is such a mechanism. On the one hand, juries are used to decide on rank orders in competitions. On the other hand, they decide on guilty and non-guilty, or select from a bundle of alternatives these duties that a convict has to accomplish. However, Arrow (1963 [1951]) demonstrated that there is no social welfare function, i.e., a "process or rule" that maps the set of individual preferences profiles into the set of social preference orderings, both defined on the same sets of alternatives, such that it satisfies two well-known axioms and five "reasonable" conditions.

The conditions are: (i) "unrestricted domain" which says that none of the possible preference profiles on the given set of alternatives should be excluded; (ii) "monotonicity" which refers to Paretian efficiency ("Since we are

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[2] See Black (1963, pp.64ff.) for this judgement and the arguments.

[3] Later, the relationship of voting and Rousseau's common will was excessively discussed. See Grofman and Feld (1988) and the literature given in this article.

trying to describe social welfare and not some sort of illfare, we must assume that the social welfare function is such that the social ordering responds positively to alterations in individual vales" (Arrow 1963 [1951], p.24).), (iii) "independence of irrelevant alternatives", (iv) "citizen sovereignty" which in Arrow's words implies that the social welfare function is not "imposed", i.e., it derives from individual preferences; and (v) "non-dictatorship." Condition (v) says that there is no decision maker *i* whose preferences are identical with the social preferences, irrespective of what the preferences of the other members of the society are.

Arrow postulates that the social welfare function should satisfy the very same axioms that define individual preference orderings: "connectivity" and "transitivity" where "connectivity" implies both "completeness" and "reflexivity" which are standard for the definition of an individual preference ordering. To restate, his theorem says that there is no social welfare function that satisfies these properties and the five conditions listed. In this paper we will analyse a situation and a procedure of preference aggregation that is conclusive inasmuch as it selects a winning alternative for almost all preference profiles of the jury. Sections 2 and 3 will summarize the model and the major results that derive from it. In section 4 we compare the assumptions and results with the axioms and condition of Arrow's Theorem.

2. The Model

This paper discusses a two-dimensional jury model. The model is based on the Holler-Steunenberg model discussed in McNutt (2002, pp.282ff) and applied to European decision making in Holler and Napel (2007). The model had its roots in Holler (1994) and Steunenberg (1994). It assumes a sequential structure of decision making that is quite similar to the ultimatum game. There is a proposer and a responder. However, the game below endogenizes the judgements that characterize these empirical results of the ultimatum game that indicate a deviation from the subgame perfect equilibrium (when utilities are assumed to be linear in money). What is attributed to concerns of justice and envy in the interpretation of the ultimatum game is institutionalized by a jury. In fact, this is perhaps the most important function of juries: to institutionalize judgements that are meant to be based on justice (or truth).

The model combines the idea of winning a maximum of votes in a voting game (i.e., the jury) with utility maximization that derives from the winning proposition. The model assumes a first mover *A*, the agent of the plaintiff, and a second-mover *D*, the counsel of the defendant. It what follows we call *A* the "plaintiff" or proposer, and *D* the "defendant" or responder. Typically, *A* and *D* are agents of parties that have conflicting interests. They face a jury that consists of three groups of voters, J = {1,2,3}, such that no single group has a majority of votes. Each group is characterized by homogeneous preferences on the alternatives u, v, and w. The set of alternatives is given by Ω = {u,v,w}. Its elements describe the possible outcome selected by a simple majority of the jury members (i.e., the voters), subject to the alternatives

presented by *A* and *D*. For simplicity we assume that each group of voters in J is a singleton so that we have three voters.

Table 1. Preference profile of the jury members

Ranking	Voter 1	Voter 2	Voter 3
High	*u*	*v*	*w*
Middle	*v*	*W*	*u*
Low	*w*	*U*	*v*

Table 1 represents the preference profile of the jury members. Voter 1 prefers *u* to *v* and *v* to *w*, and so on. Figure 1 demonstrates that the preferences of the voters are not single peaked (i.e., they are intransitive).[4] Note that Table 1 represents a selection of jury members with a maximum of diversity in their preferences. Pairwise comparison of alternatives implies cyclical majorities as there is no Condorcet winner if voters vote sincerely, i.e., if they vote in accordance to their preference orderings expressed in Table 1. As a consequence, if agent *A* proposes alternative s ∈ Ω there is always an alternative t ∈ Ω that is preferred to s by a majority of jury members if presented by agent *D*.

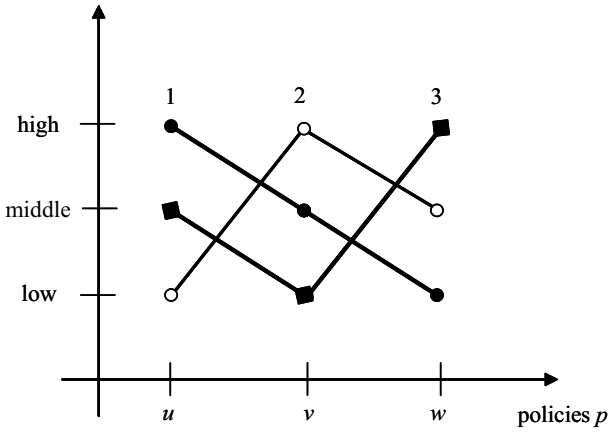

Figure 1. Non-single peaked preferences

If *A* is interested in winning a majority and thus to win the case, and *D* has the same target, then its intentions will be frustrated whatever alternative *A* proposes. However, in general, legal cases are not only about winning, but also about outcomes. The clients of A and D have preferences with respect to the elements of Ω and their agents *A* and *D* have to take these preferences into account. We assume that *A* and *D* represent the preferences $w > u > v$

[4] There is no ordering of u, v, and w such that the preferences of all three groups of voters are single peaked. Thus, preferencs are non-single peaked (see Black, 1948).

and $u > v > w$, respectively. (Here, symbol > represents the binary relationship "better.") This defines the first dimension of the agents' preferences.

The second dimension of their preferences is indeed defined by "winning," "losing," and "compromise." We assign the numbers 1, 0 and ½ to these events. Given a particular outcome $k \in \Omega$, both A and D prefer event 1 to event ½ and event ½ to event 0. Often, in a legal case, the losing party has to pay fees to the court and cover the legal expenditures of the winning party. Therefore, winning the case is beneficiary *per se*.

More general we can write the preferences of the two agents A and G in the form of utility functions $u_i = u_i(m, p)$, $i = A, D$. Here $m \in M = \{0, ½,1\}$ expresses the probabilities of winning of a majority of votes in the jury which is assumed to be ½ in the case of the indifference of the decision-makers or in the case of non-decisiveness (ties) in the voting body. Or, it signals that both parties agree on a specific alternative. This alternative can be understood as a compromise with the consequence that the case will be closed and no vote is taken. Thus, there will be no loser and no winner. The variable p is defined by $p \in P = \{u,v,w\}$. Here P describes the *discrete* set of alternatives that the agents can choose. We assume that this set is identical to the set of alternatives that can be submitted to a vote. Thus sets P and Ω are identical.[5]

We further assume that agent A knows the preferences of D, and agent D knows the preferences of A, and both know the preferences of the jury members as shown in Table 1. The assumption that A and D know the preferences of the other party is perhaps not far away from most real-world settings. However, knowing the preferences of the jury members seems to be more daring. However, given these assumptions, the game model that is discussed in the following is characterized by complete (and perfect) information. We now derive the optimal choices of A and D in this game. This problem is "solved" for a subgame-perfect equilibrium by backward induction. Agents A puts himself into the "shoes" of D and ask how will D react if A presents u, v, or w, alternatively. The choices of A are represented by u^*, v^* and w^* in Figures 2 and 3. What are the best replies of D, given the choices u^*, v^* and w^*?

3. The Optimal Choices

The potential best reply set of agent D, illustrated in Figure 2, shows the outcomes which derive from the choices of A and D for the given preferences.[6] If A chooses w^* and D selects v, voters 1 and 2 will vote for v and 3 will vote

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[5] The variable m represents the standard vote maximizing objective that public choice theory assumes for political agents, while p is a close relative to the utility maximization suggested in Wittman (1973) that becomes relevant if the incumbent (i.e. the proposer) faces cyclical majorities and thus cannot win an election.

[6] These preferences result from applying the dominance relation, but do not consider trade-offs between m and p. For example, in D's perspective u dominates v as a response to A's choice of u (denoted by u^* in Figure 2). However, winning for sure ($m = 1$) with w, that is ceteris paribus the least desirable policy for D, may potentially be preferred to responding with u resulting in outcome u (indicated in bold in Figure 2) but only with $m = 1/2$.

for w (see Figure 1). Thus D will win a majority of votes (m = 1) and v will be the outcome.

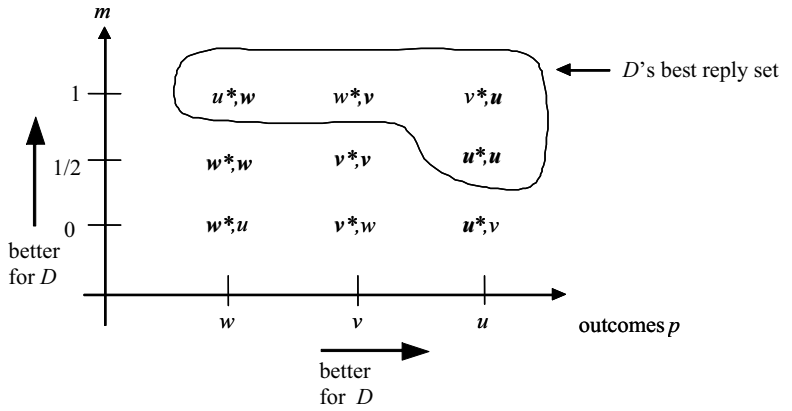

Figure 2. Best reply set of agent D

The ranking of D on the pairs (m, p) is illustrated in Figure 2. For example, D prefers the outcome (1, v) to (1, w) which results from the choices represented by (u^*, w). However, D prefers (1, u), which results from the choices (v^*, u) to (1, v). Given m = 1, Figure 2 reflects the Condorcet Paradox: D will win with certainty and no $s \in \Omega$ exists which can prevent D from winning. The pair (u^*, u) says that both A and D select policy u and thus there is a 1 in 2 chance of each of them winning the vote.

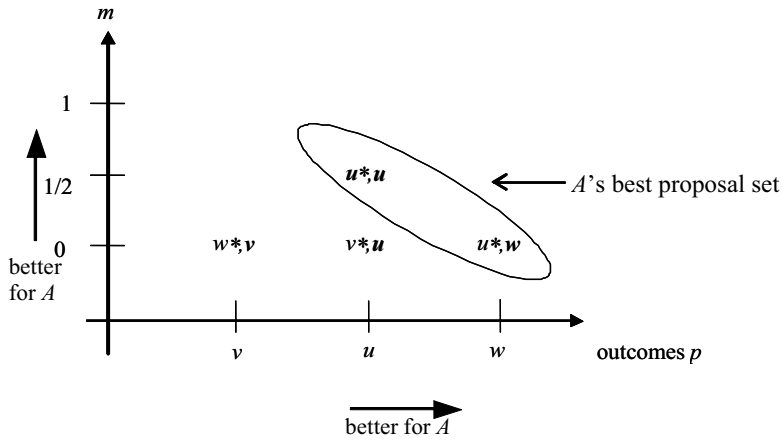

Figure 3. The best proposal set of agent A

Obviously, seen from the perspective of agent A, there are elements in the potential best reply set of D that are dominated by another element in this set. Figure 3 illustrates A's evaluation of the elements contained in D's potential best reply set. Given A's preferences, (w^*, v) and (v^*, u) are clearly

dominated by (*u*, u)* and (*u*, w)*. Thus, we can conclude that *A* will propose the alternative *u**. Whether *D* accommodates and proposes an identical policy or whether it selects *w* to defeat the proposed policy *u**, is a question of *D*'s preferences on (*u*, u)* and (*u*, w)*. If we abstract from the case that *D* is indifferent as regards these two alternatives, then the outcome of the two-dimensional jury game is uniquely determined and corresponds to a subgame perfect equilibrium.

More generally, every finite sequential-move game of perfect information has a *unique* subgame perfect equilibrium if all players have strict preference orderings over the possible outcomes. This follows by backward induction.

Note that the social preferences, i.e., voting outcomes, are not cyclical although we dropped the assumption of one-dimensional single-peaked preferences. Note further that the voting outcome could be *u* irrespective of whether *A* or *D* is winning the election. Thus we conclude that there is a chance for a rather stable arrangement despite the fact that voter preferences are non-single peaked. The platform *u* can function as a substitute for the median position which is not defined for cyclical preferences. This implication of the above model is quite different from the standard result in the case of non-single peaked voter preferences which suggests that the winning outcome will strictly depend on the agenda in pairwise voting. For instance, given the preferences of the voters in Table 1 and no voter represents a majority of votes, *w* will be the outcome if *u* and *v* are submitted to voting in the first round and the winner, *u*, competes with *w* in the second round.

Holler (1982) analyzes all 36 cases that result from combining the possible preferences of a first mover *A* and a second mover *D* if the preferences of the two candidates have the structure of any of the three preference orders given in Figure 1. Each best proposal set of the corresponding proposer-responder game contains two undominated alternatives. One of these alternatives is characterized by a pair of identical propositions. This implies that there is a chance that the result will be the same, irrespective of the agent who wins a majority of votes. In the case discussed above, this of course presupposes that both agents prefer (1/2, *u*) to winning a majority "with certainty" but having to propose something less preferred than *u*. The latter possibility characterizes the second undominated alternative in the best proposal set.

From the analysis of 36 cases in Holler (1982) we can conclude:

(i) There is a second-mover advantage in the above game: being the first to present a proposal can never be preferred to being the second. If the proposal of *A* is acceptable to *D*, because it ranks high in *D*'s preference order, then the latter can select an identical proposition, thereby gaining a 50% chance of winning the election. If the proposal of *A* is not acceptable to *D*, because it ranks low in *D*'s preference order, *D* can present a different proposal and win a majority of votes.

(ii) However, there are combinations of preference profiles for jury members and agent's preferences on $\Omega = \{u,v,w\}$ such that the outcome of *A* presenting a proposal first and *D* second are identical to the outcomes of *A* presenting a proposal second and *D* presenting a proposal first. That is, the second-mover advantage is "weak."

4. Discussion

In this section we will discuss our results with reference to two standard models. First we relate them to Don Saari's observation that a majority cycle profile is not neutral when matched with other preferences. Then we ask the question whether our results are different from the standard observation that the agenda is decisive for the selection of the winner, given cyclical majorities.

Following Saari (1995)[7] we now combine our proposer-responder model with a jury whose preference profile is in a way complementary with the profile in Table 1 inasmuch as it consists of the "other" three preference orderings that can be formed out of three alternatives. (There are n! different orderings that can be formed out of n elements.) Not surprisingly, the preference profile in Table 1a implies cyclical majorities as well.

Table 1a. Preference profile with cyclical majorities

Ranking	Voter 1	Voter 2	Voter 3
High	*u*	*v*	*w*
Middle	*w*	*u*	*v*
Low	*v*	*w*	*u*

Now let us see the (optimal) choices of *A* and *D* facing the jury represented by Table 1a. The best reply set of D is shown in Figure 4. Again it illustrates *D*'s best replies to the alternative propositions possibly brought forward by *A*. Starting from this result we derive the best proposal set for *A*. The result is illustrated in Figure 5.

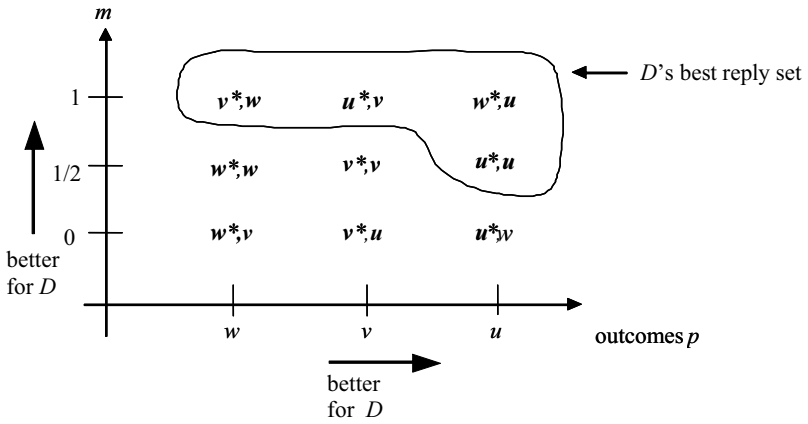

Figure 4. Best reply set of agent *D*

[7] See Nurmi (2006, p.131) and the appendix for illustration and discussion.

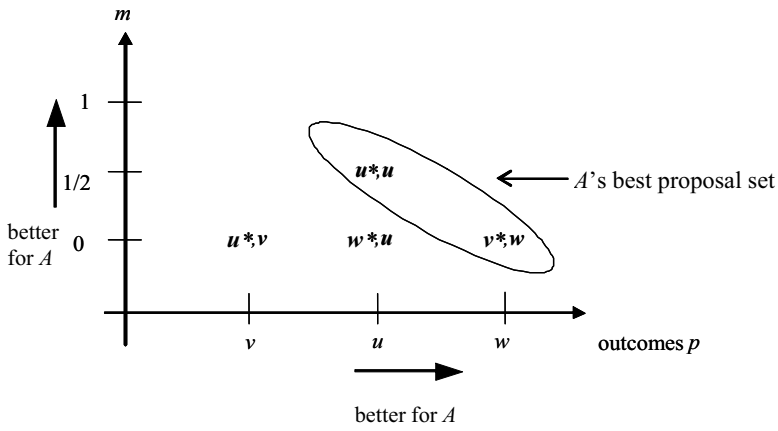

Figure 5. The best proposal set of agent *A*

Figure 5 implies that *A* can initiate outcome (*u**,*u*) or outcome (*v**,*w*). If *A* prefers to achieve its highest ranking alternative at the expense of losing the case through jury voting, to achieving its second ranking alternative and a chance of ½ to win the case, then A will propose *v*. Correspondingly, *D* will react with *w* and *w* (and *D*) will win. If not, then *A* proposes *u*, the outcome will be alternative *u*, and *A* will win the case with probability ½. Obviously, given the jury's preference profile in Table 1a, *A* decides what alternative will result. This implies a first-mover advantage for *A*. Note, in case that the jury's preference profile is given by Table 1, *D* decides whether *u* or *w* will be the outcome. This confirms that Condorcet paradox profiles are *not neutral:* The jury can have an impact on the final outcomes even if the preferences of its members are intransitive.

It is well known that when facing a Condorcet paradox the agenda decides on the outcome in case of pairwise voting. Given a preference profile as in Figure 1 and none of the voters (or groups of voters) has a majority, alternative *u* will be the winner if *v* and *w* compete in a first round and *u* challenges the winner of this round. Similarly, *v* can be made winner if *u* and *w* compete in the first round. The above proposer-responder model endogenizes the agenda. It adds competition on selecting the alternatives. The competition results from the agents' interest in the resulting alternative and in the winning of a majority of votes. This model still allows a sequence of alternating alternatives to win, if *A* and *D* take turns, which can be interpreted as a cycle, however, it does not exclude a stable result as suggested by (*u**,*u*) in the above specification.

5. Conclusion

In Arrow (1963, p.1) we read that in "a capitalist democracy there are essentially two methods by which social choices can be made: voting, typically used to make 'political' decisions, and the market mechanism, typically used to make 'economic' decisions." The procedure that we analysed above does not give a social ranking of the alternatives, but indicates a possible choice. Thus, strictly speaking, it does not define a social welfare function but a social choice function. However, this concurs with the result that we expect from applying voting procedures[8] and the function of making political decisions that Arrow assigns to them. Voting procedures involve the counting and adding up of votes. This implies cardinality and interpersonal comparison, irrespective of whether "one person, one vote" applies or votes are weighted like, for instance, in the council of ministers. There is a fundamental tension between Arrow's project – a social welfare function that assumes ordinal preferences of the individuals and ordinality of the social ranking – and voting. There is. Moreover, a certain contrast between the obvious cardinality of voting, and the reference to voting as an aggregation procedure, and Arrow's assertion "…that interpersonal comparison of utilities has no meaning and, in fact, that there is no meaning relevant to welfare comparisons in the measurability of individual utility …If we cannot have measurable utility…, we cannot have interpersonal comparability of utilities a fortiori" (Arrow, 1963 [1951], p.9).

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[8] There are however voting procedures that give a ranking of the alternatives that can be interpreted as a social welfare function (e.g. Borda count). Needless to say that such social welfare functions do not satisfy the Arrow's axioms and conditions as stated in the introduction.

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Appendix

The following derives from Saari (1995). Table 2 represents a preference profile that has alternative *u* as an obvious majority winner. However, *u* is also a Condorcet winner as wins the support of a majority of votes in a pairwise comparison with any other alternative.

Table 2. Preferences with Condorcet winner u

Ranking	7 Voters	4 Voters
High	*u*	*w*
Middle	*w*	*v*
Low	*v*	*u*

It is easy to see that the preference profile in Table 3 does not produce a majority winner, if voters vote sincerely, and in fact implies cyclical majorities so that, in addition, no Condorcet winner exits. Since the frequencies of the three alternative preference orderings in Table 3 are just four times of what we have in Table 1, this should come as no surprise.

Table 3. Preference profile with cyclical majorities I

Ranking	4 Voters	4 Voters	4 Voters
High	*u*	*v*	*w*
Middle	*v*	*w*	*u*
Low	*w*	*u*	*v*

However, if we now combine Table 2 and Table 3 for a unified preference profile and vote distribution, and we assume that voters vote sincerely, then alternative w is the Condorcet winner. This result demonstrates that a preference profile with cyclical majorities is not a *neutral element* to joining with additional voters. This is even more apparent when we combine Table 2 with the preference profile in Table 4 which is complementary to the profile of Table 3 inasmuch as it consists of the "other" three preference orderings that can be formed out of three alternatives. Not surprisingly, the preference profile in Table 4 implies cyclical majorities as well. However, if unified with the profile in Table 2, cyclical majorities still prevail and the voting game is inconclusive.

Table 4. Preference profile with cyclical majorities II

Ranking	4 Voters	4 Voters	4 Voters
High	*u*	*v*	*w*
Middle	*w*	*u*	*v*
Low	*v*	*w*	*u*

A comparison of the combinations of Tables 2 and 3 and Tables 2 and 4 suggest that the inclusion of a profile of cyclical preferences may either change the outcome of a voting game or destabilize the situation.[9]

[9] Don Saari's concept of a "ranking wheel" allows for identifying the preference profiles that are characterized by a majority cycle, i.e., a voting paradox. (Saari, 2011).

Zane Zeibote

Interdisciplinary Aspects of Researching Competitiveness of Business Clusters

Abstract

During the last two decades the concept of clusters has gained extreme popularity and it has been widely applied as an economic policy instrument and a method for increasing the competitiveness of enterprises in different countries and regions. The importance of regional clusters as a natural basis for innovation development has been emphasised by the Strategy on Regional Policy in Europe "*The Europe 2020*". This article will focus on the interdisciplinary nature of cluster phenomenon which has served as a research subject in economics, geography, and management sciences. In this respect the clusters' concept and its evolvement, methods of cluster identification, as well as international experience of their application will be analyzed. Also, the impact of clusters on competitiveness of enterprises and the importance of cluster support policy will be analyzed in the framework of this research. The analysis of cluster support policies indicates that in several cases, including the case of Latvia, there is a lack of political will to implement joint state and private sector initiatives, which affects the development of clusters, as well as hinders the efficient use of EU resources and the implementation of projects on national and trans-national levels.

Keywords: clusters, competitiveness, cluster support policy.

1. Introduction

The European Commission (EC) in its Strategy on Regional Policy in Europe "*The Europe 2020*" (European Commission, 2010) emphasised that one of the most important tasks for more effective and faster use of the European Union Structural Funds for supporting innovation is the strategy for competitive specialization of the region (Landabaso, 2010). This initiative encourages regions to identify the most important realistic factors of competitiveness based on the concentration of specific resources for creating a natural environment for innovation development. According to the Strategy on Regional Policy in Europe, European Commission among other things emphasizes that regional clusters provide natural basis for the development of innovation (Landabaso, 2010).

The objective of this paper is to provide an input for better and clearer understanding of benefits from cluster development, their role in increasing competitiveness and innovation, as well the importance of cluster support policies. The paper will also tackle the interdisciplinary approach of cluster research and existing data shortages. The development of clusters and cluster support policies in Latvia will be exploited as a practical example to illustrate how the economic development of a country or a region could be promoted

using the cluster approach as an instrument for creating more favourable environment for promoting innovation.

During the last two decades the concept of clusters has gained extreme popularity and it has been widely applied as an economic policy instrument and a method for increasing the competitiveness of enterprises in different countries and regions. In economic, geographic, management and business research literature, business clusters are mentioned in relation to the agglomeration of small and medium enterprises (SMEs) around large enterprises, the concentration of which are in certain geographic regions, as well as science and technology parks, and business incubators. Before the term „cluster" came into use, researchers utilized the concept of geographic agglomeration, which was first described by A. Marshall (Marshall, 1890) as the characterizing tendency of enterprises belonging to the same sector of economy to concentrate in certain geographic areas. In this respect, cluster is not a new phenomenon, but it has existed already for more than a century.

Tendencies of enterprises to concentrate or agglomerate historically have been described in works of different authors (Marshall, 1980; Pérroux, 1950; Myrdal, 1957; Brusco, 1982; Piore and Sabel, 1984). However, the concept of „cluster" has been widely applied only since the early 1990s, when Professor M.Porter of the Harvard Business School published his famous book „Competitive Advantages of Nations" based on cluster research in the United States and several European countries (Porter, 1990). M.Porters defines a cluster as, "a geographically proximate group of interconnected companies and associated institutions in particular field, linked by commonalities and complementarities" (Porter, 1990, p.254). In addition, Porter emphasises that clusters can be created within one city, region or country, or even within a group of neighbouring countries (Porter, 1990, p.254).

The creation of a cluster is greatly influenced by the same factors as agglomeration of enterprises and they are related to historical obstacles, the production and labour force location and other elements (Porter, 1990). Also, these factors are influencing clusters' concentration in particular geographic region and competitiveness of this territory. Also, there is a high probability that several of the above mentioned factors are interrelated. According to P.Krugman (1996) an important condition for the creation of a cluster is new technology, but this is not the most important one. For instance, technology (IT) is considered one of the most important factors of the US Silicone Valley's cluster. However, technologies became more important during the growth phase of this cluster and not during the creation of cluster.

Successful examples of applying the cluster model are visible in the sea ports of Rotterdam, Hamburg, Copenhagen and others. Most sea ports are naturally concentrated businesses, where all operations are in the same place, including production, packaging, logistics, commercial and legal services, financial and insurance services, etc. Business networking taking place in these ports facilitates the successful co-operation of enterprises thus helping to increase their competitiveness, as well as the competitiveness and recognition of their business location (ports).

In 1991, two professors of the Swedish School of Economics - Sölvell and Zander, in co-operation with Porter, published a book entitled "Advantages Sweden" (Sölvell et al., 1991) which emphasized the promotion of the clusters concept in the economic policy of Sweden. It is important to note that the implementation of this concept has been successful in Sweden.

The cluster approach and the successful utilization of its competitive advantages was to a great extent behind the new Finnish economic policy, which was necessary to implement in order to alleviate the deep crisis that Finland went through in the beginning of 1990s. The Finnish cluster analysis and perspectives of cluster development are well described in the book "Advantage Finland. The Future of Finnish Industries," published by the Economic Research Institute of Finland – ETLA (Hernesniemi, 1996). Conclusions drawn from this research were used for creating a „road map" in order to work out a new economic policy for Finland.

The experience of countries applying the cluster approach to promote growth and competitiveness has been thoughtfully analysed in the so- called clusters' *Red Book* (Sölvell, 2008) which provides additional evidence on the economic significance of the role of clusters. As stated by the Report of INNOVA,[1] an initiative at the EU Presidency Conference, enterprises are more efficient in clusters because they can count on higher assets and an increased number of suppliers during the shorter period of time when they are acting together than when alone. Also, enterprises and research institutions can achieve a higher level of innovation as a result of the co-operation encouraged through the clusters Knowledge transfer and close co-operation with clients and other enterprises, constantly create new ideas and encourage more intensity and creativity, while the cluster environment also helps reduce costs. In addition, the process of business formation takes place more actively in clusters, because while starting a business is more complicated in an external environment, it is much easier to find partners and suppliers within clusters. Thus clusters reduce risks, while providing better opportunities for enterprises to attract labour with the necessary specified qualification (Europe Innova, 1998b, p.11).

2. The Impact of Cluster for Increasing Competitiveness

Since the 1980s, the world economic downturn, as well as the result of the recent economic crisis, the interest about innovation has greatly increased. The innovation has become the economic policy priority for increasing competitiveness into international market. In his work, "Comparative Advantages of Nations," M. Porter defines an innovation as an attempt to create a comparative advantage by accepting or discovering new and improved ways of competition for industries and introducing them into the market (Porter, 1990, p.45).

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[1] Established with the support of the EU DG Enterprise and Industry at the Centre for Strategy and Competitiveness of the Stockholm School of Economics.

J.Schumpeter is considered the developer of the theory on innovation and the theory of evolutionary economy, which inspired many other researchers. He established the basis for the following four economic theory ideas: 1) innovation as the main engine for market economy development; 2) the importance of understanding the long term historical, evolutionary economic changes; 3) the difference in understanding between invention, innovation and innovation diffusion; and 4) the connection between organization, management and social and technical innovation (Schumpeter, 1939, p.45). The significance of innovation for fostering competitiveness and innovation is proven by many facts. For example, according to OECD research, during the period from 1975 to 1995, half of the economic development of industrially developed world countries was achieved because of innovation (OECD, 2000). Theory indicates that there is a strong connection between innovation, competitiveness and productivity. Thus, innovation promotes an increase in productivity, as well as stimulating an increase in competitiveness because innovative products and services are more competitive in international markets.

The extensive research on the concentration of innovative enterprises in the framework of the European Union was carried out by Dr. Hilpert (1992, p.18), who discovered that three fourths of EU funds for research, including national financing of member states, are concentrated in ten so-called European "Innovation Islands", including Greater London, Roterdam/ Amsterdam, Ile-de-France, the Rure region in Germany, Frankfurt, Munich, Lion, Grenoble, Turin and Milano. This research as well as other facts, indicate that innovative enterprises have a tendency to concentrate in certain places or regions which are typical for business clusters. This means that clusters have a role in promoting innovation. At the same time, Dr.Hilpert's research does not provide information on processes taking place within clusters to promote innovation, as well as competitiveness.

According to M.Porter, cluster participants (enterprises) should be interrelated and must provide an important impact for fostering innovation. Clusters, mutual relations between customers, suppliers and other institutions are important for improving efficiency, as well as for promoting innovation within the enterprises. The location of enterprises influences comparative advantages considering their impact on productivity and its increase (Porter 2000b, p.15-34). Therefore, the key to successful competition lies in the ability to consistently develop innovative (products or services?), as well as to strategically position the enterprise in the market ensuring that the products and services offered are different and better than those of its competitors.

Taking into account cluster's relations with universities and research institutions the concept of clusters is being increasingly associated with new or knowledge economy. This is based on the argument that localization promotes processes related to the development of new knowledge in the economy, and the application and commercialization of innovation (Martin et al., 2003, p.5-35). This idea is strongly supported by American researcher Norton (Norton, 2001) who considers that economic success in the United States is directly related to the development of new economic policy resulting

from large and dynamic innovations and the development of business clusters.

The relation between clusters and innovation is analysed also in several other academic works. For instance, after researching cluster based innovation in 17 European countries, Morano (Morano et al., 2006), discovered that in all cases innovations were concentrated in certain geographic regions corresponding to the location of clusters. In addition, this research confirms that geographic and institutional closeness represents factors which typically promote innovation. These results are repeatedly accepted by the report published by the European Commission, entitled "European Regional Clusters" (Isaksen et al., 2002).

As a result of globalization, enterprises must be competitive not only in local, but also international markets. For this reason they need greater elasticity, the ability to rapidly and effectively change their business strategies, as well as specialized suppliers and other business partners.

In his later works, M.Porte (Porter, 2003, p.549-578) points out that regional welfare is based on the export oriented clusters. Exporting clusters tend to pay higher salaries to their employees than those who are operating only on the local market level and they also stimulate an increase of salary levels in the regional economy. Exporting clusters have connections with partners and suppliers on an international level which is especially important for competitiveness and lowers the importance of connections at the local level.

New theoretical reasoning of the cluster concept of M.Porter has much in common with the traditional export basis theory, which maintains that growth is promoted by the demand of a specific regional export. One of the first developers of this theory was Ohlin (Ohlin, 1933). It was continued by Richardson (Richardson, 1969) and other researchers who declared that regional growth is determined by the successful exploitation of natural advantages and export possibilities which, in turn, are greatly determined by external demand from other regions and countries. Regional export capacity is partly determined by the specialization in areas of regional comparative advantages. Further research of export models approves the hypothesis that the geographic concentration of economic activity improves productivity and promotes their growth. It is possible to say that in the beginning of the 1990s, the traditional export theory was reborn by one of the world's leading economists, Paul Krugman presenting his "new economic geography" theory. This new theory also recognizes the significance of investment of separate regions and cities in increasing the competitiveness of economy.

The overall Community innovation surveys[2] based on the Oslo Handbook (OECD, 1997) methodology are being periodically conducted in the European Union Members States and it shows that innovation in many countries has promoted active exchange of knowledge between enterprises. It should be noted that the survey results indicate that, especially in the three Baltic

[2] Community Innovation Survey (CIS), ftp://ftp.cordis.europa.eu/pub/innovations-smes/docs/results_from_cis3_for_eu_iceland_norway.pdf

States, the enterprise innovation for creating new products or processes has mostly taken place jointly with other enterprises or institutions or enterprises have had one or several cooperation agreements on innovation with other enterprises or institutions. In Latvia it happened in 61,4% of cases, but in Estonia in 50% and in Lithuania – 48,6%. Most rarely the co-operation on innovation between enterprises has been taking place in the United Kingdom (27%). According to the author, these particular findings are the result of the comparatively small markets of the Baltic States, which facilitate cooperation between enterprises by joining competences and resources to achieve common targets. Overall, the survey results indicate that innovative enterprises cooperate more actively in international markets and more actively use external relations and knowledge (Arundel, 2006, p.8-10). Also, these results indicate that clusters have a positive impact on innovation at the level of enterprises.

In the framework of the European Commission innovation survey, the United Kingdom National statistical office, according to the request of the Trade and Industry Department, conducted a survey in 2001 for the period between 1998 and 2000 (CIS 3), involving 8172 enterprises from production and construction, wholesale, financial intermediation and business services sectors. After comparing the survey data, it was concluded that turnover and export indicators of innovative enterprises are approximately three times larger than for enterprises without innovation. Taking into account that exports are one of the indicators of competitiveness, it is possible to conclude that innovation is an important factor for promoting competition.

According to the above mentioned, it is possible to agree with M. Porter that export is one of the most important factors for competitiveness and economic development. Exports are important because they encourage the creation of capital, profits and the generation of new ideas. In turn, economic innovation must be recognized as an important factor in facilitating exports. Thus the most important advantages of clusters outlined by Prof. M.Porter (Porter, 2008c) are the following:

1. Productivity advantages: using better and cheaper specialized investment (components and services), which are easier to access because of minimum savings requirements and lower transaction costs and taking into account shorter distances and a higher level of mutual trust between cluster' enterprises. Using common procurement services or infrastructures (especially for high technology equipment) can lower fixed costs of enterprises and lower investment for creating new enterprises;
2. Innovation advantages: the closeness between consumers and suppliers facilitates knowledge transfer and the closeness of knowledge centres ensures strong innovation potential for research activities. However, the possibility to compare performance indicators of cluster participants and accessibility of qualified workers promote innovation capacity;
3. New business opportunities: with better accessibility of information on market possibilities, the entry barriers for prospective enterprises could be lower.

3. Interdisciplinary Aspects in Research on Clusters and Competitiveness

The cluster phenomenon has served as a research subject in economics, geography, and management sciences. Professor M.Porter of Harvard University first analyzed the impact of business clusters on competitiveness and the corporate strategic development from the perspective of management science. For many years, Porter's books on strategic development processes, competitiveness and the use of comparative advantages for promoting growth and have played the leading role for development of the management science's theory.

The science of economics began applying the concept of competitiveness only in the 1980s, effectively taking it over from management science. The most important role for popularizing this concept belongs to research works of Prof. Porter, such as "Comparative Advantages of Nations" (Porter, 1990) and "On Competitiveness" (Porter, 1989).

In addition, Prof. Porter's research changed the classical approach of explaining competitiveness, characterized as a cost advantage, for example labor costs, devaluation, etc. In addition Porter discarded the previously utilized explanation of success by individual nations in certain industries as resulting from aggressive industrial politics and cultural specifics in the management systems, such as, for example, Japanese management. Instead, Porter offers the so- called diamond model, which determines four main factors of competitiveness, namely, strategy of enterprise and business environment, demand conditions, closeness of supporting and related industries, and production and investment factors. The diamond model helps evaluate the competitiveness of a state or region and various aspects of the business environment that are especially important for enterprises deciding on their location. By applying this method, competitiveness can be reflected as the function of specialized and developed production factors determined by demand, strategy of enterprises, as well as closeness of mutually related industries or clusters.

In fact, the application of the competitiveness model on enterprises at the microeconomic level, as well as on the national or macroeconomic level is controversial. In the case of business clusters, they are not related to microeconomic or macroeconomic levels per se, but can rather be placed somewhere in between both of these levels. Therefore, it is quite difficult to define competitiveness beyond the framework of individual enterprises and this can be better analysed from a management science perspective, rather than from an economics perspective.

Prof. Porter first emphasized that external factors, such as war, natural disasters, and technological change, as well as government policies play important roles for the competitiveness model (the Diamond model), in various ways that are difficult to predict, but that influence every element of this model. The competitiveness concept of M.Porter was strongly criticised by such opponents as Reich (Reich, 1990) and Krugman (Krugman, 1997). Economists usually directly relate the competitiveness of enterprises with productivity. This aspect is especially emphasised by P.Krugmans (Krugman,

1990, p.9) and other scholars who stress that "competitiveness" is merely a term replacing the expression "productivity". Clearly then, in general, it is possible to explain "competitiveness" by using the term productivity. However, it remains important to analyse the factors behind productivity for determining the increase in volume of produced goods and services with similar or comparatively smaller investments.

M.Porter devoted his book "Comparative Advantages of Nations" to explaining how enterprises can achieve a certain level of productivity by being located in a specific place. In his work, welfare or living standard of region or nation is determined by the productivity of exploiting its human, capital and natural resources. Consequently, while competitiveness is determined by productivity, the latter cannot be created in a vacuum and is very much dependent on innovation (Porter, 2002). M.Porter notes that productivity and competitiveness are equal to innovative capacity and can be compared to productivity according to importance. Conditions of increased globalization require focusing on the creation of high value added goods and services, which have to be achieved in innovative ways (Porter, 2003, p.549-78). Thus, productivity and innovation, rather than low salaries, low taxes or devaluated currency, is the definition of competitiveness (Porter, 2002).

According to the definition provided by M. Porter, the most important relation between innovation and competitiveness is that innovation is important for promoting productivity. In turn, the competitiveness is closely related to macroeconomic level, including the business environment, which is directly related to enterprise productivity and innovation capacity.

Considering the multidisciplinarity and interdisciplinarity nature of the business cluster, as well as the European Union's (EU) statistical classification requirements, the biggest challenge for cluster researchers is choosing the right methodology to conduct their research and assessing its practical application for such tasks as, for example, cluster identification and the evaluation of its role in the national economy. The current statistical system used by the EU and its member states is not suited for interdisciplinary research, which will grow in importance in the near future.

According to the requirements and methodologies of the Eurostat, Latvia's economic activity is classified according to so-called NACE system (*Nomenclature statistique des Activités économiques dans la Communauté Européenne*). The current NACE2 classification or improved version of NACE1, which was significantly revised and restructured from 2000 to 2007, with the goal of reflecting the results of structural economic changes and technological development. Despite reorganization, NACE2 is still not detailed enough and, in many cases, does not ensure sufficient access to data and information. Thus, cluster research in Latvia and the EU is complicated, especially at the level of service industries and for determining perspective industries. Detailed and precise data is available only by interviewing each and every cluster enterprise, which is not always possible. The above mentioned obstacles determine certain limitations to interdisciplinary research.

Opposite from the EU, the North American statistical system uses such terms as "sector" and "industry" based on the structure of statistical system. The

North American classification system of industries, "The North American Industry Classification System" (NAICS), divides industries according to 6 level codes introduced in 1997 by the US, Canada and Mexico completing the Standard Industrial Classification System (SIC) introduced in the US in 1937, which classifies industries according to 4 level codes. This system is regularly revised and reorganised every 5 years according to requirements of economic development. NAICS is widely used by investors to classify enterprises with similar production processes, which are categorised in the same industry. As a result, the SIC system is still used by several United States' departments and agencies parallel to NAICS.

The European Cluster Observatory (ECO), established in 2006 at the INNOVA organization in Sweden, worked out a cluster mapping method corresponding to quality and accessibility of data of the European statistical codification system using as an example the methodology applied by the Strategy and Competitiveness Institute of the Harvard Business School. According to the method of quantitative analysis which is used by ECO for the identification of statistical clusters the employment data on industry level or divided by the economic activity (NACE2) with 4 level code, and in separate cases with 3 level code, separating sub-industries were applied. In addition, innovation and export data was applied to obtain more complete information on clusters. As a result, the ECO has identified more than 2000 statistical clusters across 38 categories or types of activities in 259 European regions, as well as identified 1307 cluster initiatives or organizations in 220 European regions.[3] However, this data is incomplete, because researchers had to often interpret the statistical indicators. In the case of Latvia, clusters of national significance in the most important types of economic activity were identified, although the distribution of clusters by their types of economic activity across the 4 Latvian regions was not provided (See Table 1).

The reason for choosing the research model conducted by the Ministry of the Economy of the Republic of Latvia (RL) "Development trends, competitiveness and structure of sectors of economy" (Ministry of Economy RL, 2004, p.64) states that "currently available and widely used statistical information permits to obtain certain perception about dynamic economic processes and even to predict possible changes of events (more precisely – economic indicators), but does not permit to argument ongoing processes and their development directions within branches (sub-branches) of the economy. The essence of this problem is in the obstacle that there is no systemised information on the enterprise structure of branches of the economy according to entrepreneurship forms, specialization, efficiency and financial performance during a longer period of time. Fragmented information is available at the Enterprise Register, Central Statistical Bureau, Bank of Latvia, and Latvian Investment and Development Agency databases, but limited services are offered by several private commercial structures."

[3] See also: http://www.clusterobservatory.eu

Taking into account the rapid development of technologies and the economy, a more active adjustment of the EU's and Latvian statistical systems according to new requirements and ongoing developments is required. Availability of data at the industry (sub-industry) level would be very much required for cluster research, as well as for scientifically defined economic priorities and the evaluation of their potential.

4. Clusters and Cluster Support Policy in Latvia

The cluster issue is getting increasing attention in Europe and internationally. The European Commission's Eurobarometer has published research on European clusters and their role in promoting innovation (Eurobarometer, 2006, p.7). This research reveals that every fourth enterprise (with a minimum of 20 employees) is working in a cluster environment, for example, closely co-operating with local enterprises.

Unfortunately, Latvia has the lowest indicators in the European Union and even the world in regards to the creation of enterprise clusters, cluster branding, organizing different events promoting the creation of clusters and providing direct financial support for different cluster related activities. According to the World Economic Forum's Global Competitiveness Report 2010-2011, Latvia is in the 77th place according to indicators characterising innovation and the attractive business environment. This is much lower than for Estonia, which is in 45th place and Lithuania, which is in 48th place. It is well known that qualitative aspects of innovation and entrepreneurship development are the main economic development factors for creating a knowledge-based economic development model. Unfortunately, Latvia has a comparatively low international evaluation, as well as in the Baltic countries, when considering the level of cluster development and according to the Global Competitiveness Report, Latvia is 103rd, while Estonia is 92 and Lithuania is 105 in competition between 139 countries (Schwab, 2010, p.218-219). The European Cluster Observatory (ECO)[4] reveals that according to employment indicators, Latvia has good potential for cluster development in such sectors as construction tools, equipment and services, chemical industry, construction, education, entertainment, furniture production, heavy industry, maritime (ports) sector, transport and logistics. Since 2010, the ECO has performed separate evaluations for such sectors as creative industries, knowledge intensive sectors and life sciences, emphasising their considerable potential for economic development. In this respect, Latvia has good potential for developing clusters in creative industries and according to the ECO, they fall into the following: advertising, museums and monuments of history, radio and TV, distribution and retail (Table 1). According to the ECO methodology cluster potential is marked by 1, 2 or 3 stars according to the concentration of enterprises and labour.

[4] Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070510.

Table 1. Statistical clusters in Latvia identified by the European Cluster Observatory (2009)

Nr.	Traditional sectors	Number of employed	Number of enterprises	Marking (stars)
1.	Construction tools, equipment, services	15352	756	2
2.	Chemical industry	2266	96	1
3.	Construction	50605	2711	1
4.	Education	29572	436	3
5.	Entertainment	11505	747	2
6.	Furniture production	10713	474	2
7.	Heavy industry	2839	44	1
8.	Maritime sector	8585	348	2
9.	Transport un logistics	42080	1201	2

Source: http://www.clusterobservatory.eu (accessed on 2010 01.11.), data compiled by the author

Nr.	Creative sectors	Number of employed	Number of enterprises	Marking (stars)
1.	Advertisement	5157	1147	1.2
2.	Museums and monuments of history	6609	9	3
3.	Radio and TV	2931	226	2
4.	Retail and distribution	3280	291	1

Source: http://www.clusterobservatory.eu (accessed on 2010. 01.11.), data compiled by the author

Latvia also has other very important sectors with a significant share of employment, such as financial services and food processing sectors, but they are not identified as potential clusters according to the methodology of ECO and its applied criteria. However, these sectors are very important for the Latvian economy and there is no doubt that they have a potential for cluster development.

Initially, cluster development in Latvia was supported by the EU PHARE programme,[5] between the period of 1999 and 2002 (Vanags et al., 2002). According to research findings, the following sectors of the Latvian economy were recognized as sectors having cluster development potential: IT, forestry and machine building and new materials. In these sectors, cluster initiatives were established but only two of these initiatives started in 2001 succeeded and continue operating as cluster initiatives today.

The EU PHARE supported cluster development activities with several significant results, such as increased understanding about the importance of clusters and their development; the facilitation of mutual co-operation between players of different sectors and the initiation of possibilities to develop long term activities and objectives of mutual co-operation. Analysing

[5] PHARE – Poland, Hungary Assistance Restructuring Economies.

cluster development processes in Latvia and the role of clusters in Latvian economic development it has to be recognized that the role of clusters has not yet been fully recognized and understood.

The Government of Latvia has expressed its support for the European Cluster Memorandum (*www.proinno-europe.eu*), which emphasises that regions having necessary skills, excellent research capacity, access to the risk capital and strong clusters are having greater possibilities of becoming centres of innovation, rather than those with isolated research work and no clusters. Clusters can become the main factors that attract capital, labour force and knowledge. The Memorandum stresses that accents of discussions in Europe must be changed from facilitating state support offering to promotion of wider innovation ecology, including the support for cluster creation and development. Several European countries, especially, Great Britain, Czech Republic, several regions of Austria, France, Germany and others have actively started to create cluster initiatives.

Unfortunately, Latvia has the lowest initiators in the European Union regarding the development of enterprise clusters, cluster branding, organizing different cluster support activities and providing direct financial support for different cluster related activities. The author of this article is confident that applying cluster approach for the development of different sectors of the economy could be successfully used to increasing the competitiveness of Latvian enterprises, because clusters encourage the concentration of resources and their effective utilization. The cluster model which is based on competitive advantages has been recognized as one of the most effective ways for strengthening international competitiveness, innovation and development of enterprises in many countries.

The importance of cluster development is mentioned in the Latvian National Development Plan of 2007-2013 (Ministry for Regional Development and Local Government RL, 2006, p.20), the Latvian Industrial Development Guidelines (Ministry of Economy RL, 2004) and the National Innovation Programme of 2003-2006 (Ministry of Economy RL, 2003). In addition, the Latvian National Lisbon Programme, 2008-2010 (Ministry of Economy RL, 2005) defines the importance of clusters' development with the objective of stimulating the competitiveness and increase in productivity of enterprises by emphasizing the co-operation and collaboration with education, science, research and other related institutions. According to this programme, this has been planned to evaluate the cluster development potential in Latvia and to support the development of three most perspective clusters (Ministry of Economy RL, 2005, p.18). The Ministry of Economy of Latvia is responsible for the cluster support policy in Latvia, which conducts cluster support policy and ensures its implementation in co-operation with the Latvian Investment and Development Agency.

On June 28, 2007, The Cabinet of Ministers of the Republic of Latvia with the Decree No.406 adopted the Programme for Promoting Commercial Innovation and Competitiveness 2007-2013 (Ministry of Economy RL, 2007) stating that despite favourable industrial environment for cluster development in Latvia,

more active co-ordination of state and business policies are necessary to promote the creation of clusters.

Until 2009 when the Government of Latvia started to provide financial support for cluster development, it was possible to discuss only the Latvian IT cluster and the Latvian Forest Industries cluster initiatives. Clearly, the establishment of new clusters would help create an environment that would facilitate innovation, knowledge transfer from local and/or foreign research institutions to the production sector, an increased demand for new technologies in industries as well as it would concentrate on economic policy measures in specific industries or segments (Ministry of Economy RL, 2007, p.16).

Taking into account measures planned in the framework of the Programme for Promoting Commercial Innovation and Competitiveness 2007-2013 the point, 2.12.3 "Cluster Programme" included in the action programme of the Ministry of Economy 'Entrepreneurship and Innovation' under the measure 2.1 'Promotion of Entrepreneurship', which was implemented with co-financing of the EU Structural Funds and Cohesion Funds. The object of the state support programme "Cluster Programme" is to promote co-operation of interrelated entrepreneurs and related institutions (education, research institutions); to support implementation of joint projects to facilitate faster increase of competitiveness of industries, and enterprises, and that growth in exports, innovation and production of new products. This programme is designed to support activities related to strengthening competitiveness of clusters and developing clusters' strategies. Despite the economic downturn caused crisis, resulting in financial problems, taking into account requests of many Latvian entrepreneurs and successful experience of already existing cluster organizations, the implementation of "Cluster Programme" was started in 2009. According to this programme the most important requirements for clusters wishing to receive state support are the following:

1) Correspondence of the cluster with priority sectors defined by the Government documents;
2) Clarity and measurability of the project objectives, planned activities, indicators and planned results;
3) Introduction of the value added chain into cluster and expected results;
4) International co-operation;
5) Cluster orientation on exports;
6) Competence of the cluster co-ordinator;
7) Cluster guarantees the involvement of an expert with experience in implementing international projects.

The Cluster Programme supported 9 cluster initiatives in 2009, 9 cluster initiatives in 2010 and 7 cluster initiatives in 2011. The supported cluster initiatives are the following: IT cluster (2009, 2010, 2011), Metalworking and related industries cluster (2009, 2010, 2011), Electronics and electro-technical cluster (2009, 2010, 2011), Pharmacy and chemistry and related industries cluster (2009, 2010, 2011), Furniture and related industries cluster (2009, 2010,

2011), Cosmos technologies cluster (2009, 2010, 2011), Certain manufacturing products for export cluster (2009), Supply chain cluster (2010, 2011), Textile and related industries cluster (2009, 2010, 2011) and Food industry cluster (2009, 2010). The Cluster Programme implemented by the Ministry of Economy (MoE) will also continue in 2012-13, because, as experience shows, creation of new cluster initiatives in Latvia without specially targeted state support for this purpose has not been possible.

Latvia, similarly as many other countries, applies the cluster concept for the establishment of cluster organizations or initiatives. The fact, appearance of many new cluster initiatives in Latvia over the last few years indicate that enterprises have acknowledged their importance and co-operation opportunities they provide. In 2010, the following clusters' initiatives on different stages of their development have been registered in Latvia:

Table 2. Cluster initiatives in Latvia (2010)

Cluster initiative (CI)	Sector, industry or full name, remarks
Association "Latvian Furniture"	Woodworking, design, „Furniture production and related industries cluster development programme". Supported by the MoE Cluster Programme.
Audio visual CI	Creative industries
Biofuel CI	Energy (lack of human resources and capacity)
Biotechnologies CI	Biotechnologies
Electronics& electro- technical CI	Electronics, „Electronics and electro-technical cluster development project, Supported by the MoE Cluster Programme.
E-text-textiles CI	Creative industries (working on the project basis)
E-transport CI	Transport, metalworking, design
Pharmacy and related industries CI	Pharmacy and related industries, „Promotion of co-operation between participants of Pharmacy and related cluster for creating new export products, introducing new technologies in production and attracting investors", Supported by the MoE Cluster Programme.
Inspiration Riga	Tourism
IT cluster initiative	IT, „Promotion of international recognition of the Latvian IT cluster", self-financed cluster, Supported by the MoE Cluster Programme.
Latvian Acustics society CI	Electrotechnics and construction
Latvian Chamber of Crafts CI	Crafts and arts (microenterprises)
Latvian Construction materials' association CI	Production of construction materials
Latvian Polygraph enterprises association CI	Polygraph
Latvian Underwear manufacturers association CI	Textile sector

Linen and canopies CI	Textile sector (Gradual development of business Project on full cycle linen and canopies production), CI established in 2010.
Metalworking CI	Metalworking and design „Development of Metalworking and related industries cluster", Supported by the MoE Cluster.
Forest industries CI	Woodworking (Operates as the Federation, not planning to establish a separate CI or foundation).
Food production CI	"Food sector cluster for export promotion", Supported by the MoE Cluster Programme
Creative industries CI	Creative industries (basically operate as an incubator)
Ventspils High Technology Park, satellite technologies	„Co-operation measure for establishing the Cosmos Technology cluster", Supported by the MoE Cluster Programme.
Latvian Supply chain CI	„Establishment of CI for certain manufacturing products'export", Supported by the MoE Cluster Programme.
Latvian Light industry enterprises association CI	„Development of the business plan of the Textile and related industries cluster for innovative textile materials production development conception implementation for enterprises working in the filch sector, Supported by the MoE Cluster Programme.
Car parts production	Machine building, production of car parts.

Actively working
Not active
With development potential

Source: Author's compilation using information provided by the Ministry of Economy and the Latvian Investment and Development Agency

The economic policy makers in Latvia have not foreseen cluster support measures in the policy documents related to SMEs and entrepreneurship support, promotion of innovation, investment policy, etc. Therefore, cluster support policy has not been target oriented and implemented so far.

For enterprises of territorially small countries, such as Latvia, to be successful in international competition for competitiveness and markets, this is impossible to sustain the full production cycle in the long run. Therefore, they need to specialize in offering specific products and services. Prof. Christian Ketels from the Harward Business School, who has visited Latvia several times, has emphasised that clusters should be created in context of the Baltic Sea Region, because regional specialization has been required here. For example, if we see perspectives for the development of design industry, we need to think how we will co-operate with partners in Scandinavia, Lithuania, Estonia, Poland, etc. to become more competitive in certain area all together.

5. Conclusions

The perception of the cluster concept and its interpretation has changed over time. If initially clusters were perceived as local or geographically concentrated where enterprises, competitors, suppliers and consumers are mutually interrelating and co-operating with the objective to improve their competitiveness, it currently focuses on economic internationalization and the export capacity of enterprises recognized as especially important indicators of competitiveness. Today in many cases supply chains have became international and demand conditions can appear anywhere in the world, but innovation as a production and servicing factor is becoming increasingly important. Many international industries can receive raw materials from anywhere in the world, choosing the most efficient supply possibilities for themselves. At the same time, the concentration of industries in cities and regions, and the maintenance of local linkages remain meaningful, as well as advantages offered to enterprises by participation in clusters are still important. Moreover, according to the Europe 2020 Strategy cluster development should be supported as a basis for the development of innovation

Taking into account interdisciplinary aspects which can often be found in modern research and which are reflected in this article by using examples of clusters and competitiveness, as well as considering rapid development of technologies and changing economic policy priorities, the adoption of existing statistical systems in the EU, as well as in Latvia, would be needed according to ongoing developments and new requirements. Detailed availability of industry data would be required in order to extend research on clusters and competitiveness, as well as for defining economic priorities on national and regional levels, and for evaluating their potential based on scientific research and data. Over the past ten years there have been many new cluster initiatives established in EU member states that did not exist before, signalling the development of a new targeted cluster support policy. As the experience of many countries shows, the development of clusters usually is not possible without state or regional support, as well as co-financing of EU funds. In addition, many entrepreneurs see the state as having a significant role to play for the promotion and development of clusters.[6]

The cluster approach provides the possibility for policy makers to influence processes in more target oriented ways, which in turn, facilitate an increase in competitiveness and economic growth, as well as promote innovation. Focusing on the needs of specific industries, policy makers have more probabilities of establishing a direct dialogue with enterprises, as well as academic and scientific research institutions in order to reduce those barriers and obstacles that hinder economic development. Therefore, cluster support policy is a significant instrument for building strong innovation systems which is an important precondition for growth and creation of new jobs.

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[6] The Innobarometer in its research on 2006 concludes that approximately 68% managers of enterprises operating in cluster's environment have the opinion that state institutions play an important or even fundamental role for cluster development.

Cluster support policy in several countries, including Latvia, shows that in many cases, state and local government officials only partly understand the benefits of co-operation at the policy level. Mutual trust and openness between state institutions and private sector representatives is required to avoid possible misunderstandings and to build co-operation. Also, there is a lack of political will to delegate human and financial resources for implementing joint international projects with private entities placing an emphasis on priorities and plans of represented institutions (national and regional). It has to be recognized that the lack of ability to implement joint state and private sector initiatives in Latvia is influencing the efficient use of EU resources, as well as the implementation of projects on national and transnational levels.

Latvia has to analyse and research the experience of European and other countries on cluster support policies and application of clusters' research for promoting economic development and competitiveness. In addition, Latvian policy makers should evaluate the possibility of conducting cluster support policy on the regional level, similarly to that of Denmark, in order to stimulate the development of less advanced regions and the whole country. Taking into account the existing differences in regional development, especially in such indicators as GDP per capita, employment, investment per capita, amongst other, it would be useful to employ the cluster's concept more actively to promoting economic growth and regional development.

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Final Remarks

In the 21st century, societies with different and complex cultural identities and beliefs are forced to closely interact. How can education and research systems, as well as society cope with the influx of changes resulting from these interactions and the new thinking that comes along with them? While we do not have yet clear answers on how to cope with these many different challenges, some solutions could be found by thinking across the boundaries of economics, technology, cultural understanding, natural sciences and innovation. In other words, by thinking across fields and disciplines within education and research, there is an opportunity to create something new and meaningful for our societies.

All EU Member States are following the ambitious Europe 2020 Strategy. Education, innovation, research and development are important flagship initiatives in this Strategy. In this context essential initiatives have been taken to strengthen the role of higher educational institutions in Europe and to promote interdisciplinarity in education, training and research. In addition, reforms taking place in educational systems of the Member States must assume high priority in order to deal with the consequences of the current financial and economic crisis, which is also seriously impacting the funding of university education and research. The question is how much time and effort will be required to reconstruct the human capital once it has been dispersed?

Solidarity is one of the fundamentals of the European integration, and very often this is the only opportunity to get economies of the European Union out of recession, to maintain financial stability and keep the broad benefits of the Single Market. Education and research have a key role to play not only to promote growth and employment, but also to guarantee equal opportunities and social cohesion.

Higher education is crucial to Europe's ambition to be a world leader in the global knowledge economy. During the past several decades, a new paradigm of the function of higher education in society has gradually emerged. The universities still retain their role as the "conscience of society", however, the critical function of universities is shifting now towards becoming production of knowledge and qualified human resources. International competition is creating demand for knowledge workers of all types, a challenge that influences universities who train future professionals and knowledge producers for our society.

Universities must be able to play their full part in the so-called "knowledge triangle", in which education, research and innovation interact. Through increased interdisciplinarity, we can get more benefits from the investments in knowledge and education that we are currently pursuing. At the same time, we can strengthen the interaction between research, education and business, so that enterprises can develop unique products, which combine the most advanced knowledge within the humanities, social sciences, technology, health sciences and the natural sciences.

While the pace of adaptation to the challenges faced by the educational systems and analysed by this book is faster or slower depending on the countries, these factors are challenges for all higher education systems and exert considerable pressure on curricula development.

The above- mentioned aspects are currently subject of intensive studies, which have to answer a number of questions, for example:

How can interdisciplinarity in education and science contribute to great challenges of the 21st century and consequences of the current financial, economic and social crises?

Where there is a curriculum conflict, how can it be resolved and through what mechanisms?

What are the priorities for the universities, study programmes and research centres and what delivery methods are most effective, efficient and fair?

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Does It Provide Answers to Current Challenges
in Higher Education and Research?**
2011
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