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ABSTRACT

This book provides an overview of innovative education practices throughout regions in the United States (US) and Europe. It contains 16 papers written by experts from the educational, economic, and regional development fields in the US and the European Union (EU). Introductory materials are: a foreword (David O'Sullivan); preface (Stavros Stavrou); and introduction (Barry Nyhan, Graham Attwell, and Ludger Deitmer). The book has three parts, each beginning with a short introduction to the papers in the section. Part 1 has six papers that provide an overview of the political, economic, educational, and social objectives driving regional development and that discuss, in a theoretical way, the open-system and network-type structures and mechanisms seen as prerequisites for the successful implementation of regional development policies. The papers are "Regional Development and Learning in the European Union" (Barry Nyhan); Metropolitan Economic Strategy for America's Cities and Regions" (Henry G. Cisneros and Marc A. Weiss); "A US-EU Regional Partnership--Akron, Ohio and Southwest Saxony, Germany" (Stephen Kidder and Graham Attwell); "Stimulating Regional Innovativeness: The Learning Region" (Thomas Stahl); "Partnership and Networks: A Dynamic Approach to Learning in Regions" (Ludger Deitmer and Graham Attwell); and "The Competitive Advantage of Regions" (Felix Rauner). Part 2 contains five regional-oriented learning case studies, presented against the background of their underlying or related theoretical frameworks: "High Technology as a Path to Economic Development in Austin, Texas" (Robert W. Glover); "Vocational Education Institutes as Regional Innovation Agents in the Netherlands" (Loek F. M. Nieuwenhuis); "Integrated Strategies for Competence Development in the Graz Area in Austria" (Josef Scheff); "Regional Development and Learning: Case Studies in Southern Sweden"(Bernd Hofmaier);

and "Learning from Disequilibrium--The Case of Boston, Massachusetts" (Rosalind Greenstein and Jemeline Robertson). Part 3 consists of four papers providing an overview of projects in different stages of development: "Employment Training in Cleveland (US)" (Mary LaPorte); "Qualification Networks for Shared Learning in Lower Saxony in Northwest Germany" (Ludger Deitmer, Peter Drewing, and Reinhard Heermeyer); "Partnership Between Industry and Education in School to Work Transitions in Northeastern Pennsylvania" (Peter R. Butler and James G. O'Karma); and "A Regional Innovation Programme in Emilia-Romagna, Italy" (Claudio Dondi). (Most chapters contain references.) (YLB)

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Towards the Learning Region

Education and Regional Innovation in the European Union and the United States

2

Towards the Learning Region

Education and Regional Innovation in the European Union and the United States

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Foreword

by David O'Sullivan, Head of Cabinet of the President of the European Commission and formerly Director-General for Education, Training and Youth

In 1990 I had the privilege to be included among those who first discussed the potential for dialogue between the United States and the European Community with their rich diversity of educational structures and pedagogical practices. The proposal that the EC and US co-operate in the area of education expressed in the Transatlantic Declaration finally came to fruition with the formal signing of the EC-US Co-operation Agreement in the areas of higher education and vocational training in the autumn of 1995.

The Agreement was negotiated at a time when many feared that the EC and the US were drifting apart. It provided reassuring evidence that both partners have many interests in common and their relationship is not limited to discussions of economic and commercial matters, important as these may be.

The flowering of our cooperation with the US, particularly that via innovative joint consortia projects which encourage structural, long-term links between networks on both sides of the Atlantic, was stimulated by the adoption of the New Transatlantic Agenda This provides a political and diplomatic umbrella for a new and wider range of cooperative activities, including those of a commercial, social, cultural, scientific and educational nature.

It was in this context that the Commission, on behalf of the Member States, joined with the United States Information Agency in organising the "Akron Forum on Regional Collaboration to Develop Learning Strategies for the Global Economy" in Akron, Ohio on February 9-11, 1998. Much credit for this initiative is due to the then Associate Director of the USIA, Dr. John Loiello and my predecessor as head of the Commission Directorate-General for Education, Training and Youth, Dr. Tom O'Dwyer. I am pleased to note that all 15 Member States of the EU were represented, as well as many States of the Union. Managers of about 20 innovative regional learning projects from the EU participated, these being coordinated by the Commission departments responsible for education, training and youth, as well as those responsible for social and regional policy. Among the innovative features of the conference was the participation of community groups from the non-formal sector, a group which must play a key role in the diffusion of lifelong learning. I trust that this testifies to the prescience of the US Department of State and, especially, of the State of Ohio which hosted the event. Our thanks and congratulations are to be extended to our hosts, the Northeast Ohio Trade and Economic Consortium (NEOTEC) and to the Institute for Technology and Education (ITB) of the University of Bremen in Germany, which provided specialist support and technical assistance. The importance which is attached to the subject of the deliberations was testified to, when participants from the North of Ireland, who had formed a partnership with Philadelphia while at Akron, were subsequently invited by President Clinton and Prime Minister Tony Blair (in his role

as President of the European Council at the time) to the EU-US Summit Meeting in London in May 1998, to report on the results of the Akron Forum.

This book entitled "Towards the Learning Region – Education and Regional Innovation in the European Union and the United States", is a product of the Akron Forum. Following the event, American and European participants agreed to continue their collaboration through writing papers for what became known as the "Akron Reader" project. I am very happy to see that their work has borne fruit in the form of a comprehensive book containing a series of analytical papers and case studies. I am sure that this publication will contribute to furthering the transatlantic debate on the question of the link between education and regional development policies.

The Akron Forum built upon prior contacts encouraged in the past between both transatlantic partners. The first, held at Noordwijk in the Netherlands in 1992, addressed the topic of "School and Industry: Partners for a Quality Education", while the second, which was organised at San Diego in 1994, addressed the theme "New Visions: Education and Training for an Innovative Workforce". Both of these conferences greatly benefited from the contribution of the late Dr. Winnie Warnat, Director for Vocational Education at the US Department of Education, whose loss her European colleagues and partners deeply regret.

The diversity of practice and policy among the various Member States of the EU, and the states and regions of the US, is a great source of strength and inspiration to both partners in confronting the challenges of educating our populations for a new workplace and lifestyle at the turn of the Millennium. I trust that the bridges of mutual inspiration and friendship we are building in this area will serve to further enhance the deepening transatlantic dialogue, partnership and shared values.

Preface

by Stavros Stavrou, Deputy Director, CEDEFOP

The benefits to be gained from the coming-together of different actors in a region or locality – from the public, private and voluntary sectors – to work for a common goal, are recognised widely. From the European Union perspective, the regional policies laying down frameworks for cooperation at a local level have contributed enormously to the economic and social development of the less well-off parts of Europe. In fact, the results attained go beyond materialistic-oriented criteria and have an impact on political and cultural renewal.

In this respect, education and human resource development initiatives have a key role to play in bridging the different dimensions of life in a region – cultural, social and economic. This is reflected in the importance attached to collaboration in the field of vocational education and training areas by the EU in the implementation of its education and training and regional and social development policies.

Of course, there are great problems to be resolved in converting policy into practice in this area such as: agreeing on how learning programmes should be funded; devising schema for lifelong learning and validating informal learning. All of these issues are being addressed in the framework of CEDEFOP's current European-focused research projects.

But, it is also important that these questions are addressed in a wider international context, looking beyond the boundaries of Europe. This book entitled "Towards the Learning Region – Education and Regional Innovation in the European Union and the United States" does this through discussing the theoretical frameworks underlying regional educational innovation in the EU and US, as well as analysing a number of practical case-studies. Interestingly, another international initiative by the Bertelsmann Foundation, the Carl Bertelsmann Prize 1999, for which CEDEFOP has been a member of the 'Working Commission', has also sought to identify the best international examples of regions that are building cooperation platforms for vocational education and training.[1] 'Some of the regional issues highlighted by Bertelsmann are – fostering commitment and consensus and the establishment of governmental frameworks.

Even though CEDEFOP's publications are normally based on projects initiated within the Centre, it is very happy to publish this book because of the relevance of the content to its own mission. As well as promoting mutual learning between the European Union and the United States, CEDEFOP expects that this publication will provide a stimulus for the further development of the theory and practice of the Learning Region in the future.

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[1] Bertelsmann Foundation (ed.), (1999) Vocational Education and Training of Tomorrow, Bertelsmann Foundation Publishers, Gütersloh.

Introduction

Towards the Learning Region – Education and Regional Innovation in the European Union and the United States

Barry Nyhan, Graham Attwell and Ludger Deitmer

Context

This book has its origins in the "Akron Forum on Regional Collaboration to Develop Learning Strategies for the Global Economy" which took place on February 9-11, 1998 in Akron in the State of Ohio, US. It comprises papers written by Akron participants, some of which were delivered at the Forum, but most of them written, or significantly revised, after the event. This book can be seen as a testament to the commitment of the Akron participants from both sides of the Atlantic to exploit the rich exchanges, which took place at the conference through continuing to work together on what became known as the "Akron Reader" project. It also demonstrates the ongoing interest to continue transatlantic dialogue on the topic of regional learning.

The Akron Forum

The Akron Forum took place in the context of the 1995 "EC-US Agreement to Co-operate in the areas of Higher Education and Vocational Education and Training", and in the framework of the "New Transatlantic Agenda" (established also in 1995) to strengthen ties between the EU and the US. The Akron Forum was in fulfilment of what were termed "the People to People" objectives of chapter four of the New Transatlantic Agenda. It was sponsored by the US Information Agency (USIA) and by the Directorate General (DG) XXII of the European Commission, which has responsibility for Education, Training and Youth Policies in the EU.[2] The topic of regional learning was chosen because of the interest in key "education and training actors", working on economic and social activities in the community, in particular in the field of vocational education and training and workforce development, to participate in transatlantic exchange activities. It was decided to hold this Forum in Akron, Ohio because of the interesting regional-development work, which had taken place in the Akron area and also because of the economic and cultural links that had been established between Akron and Chemnitz in the State of Saxony in Germany in recent years.

The Akron Forum aimed to foster collaboration between US and European educators, business people, enterprise representatives, trade union officials, community leaders and government officials concerned with the development of regional learning strategies for the global economy. It set out to do this by bringing together over 100 representatives

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[2] The Akron Forum was hosted by the Northeast Ohio Trade and Economic Consortium (NEOTEC). The Institute for Technology and Education (ITB), from the University of Bremen in Germany, provided specialist support and technical assistance to the European Commission in preparing the European contribution to the Forum.

from different regions in the EU[3] and the US for three days in Akron from February 9-11, 1998.

The main points arising from the debate at Akron, and which are discussed in the different papers in this book, are presented in summary form below.

Growing movement towards regional/local collaboration including learning strategies in the EU and US

The debate at the Akron Forum demonstrated how the movement towards regional strategies to address economic and social objectives has been growing in recent times in the United States and Europe. Throughout many parts of the United States (as outlined in the paper of Ciseros and Weiss in this book), regional development strategies can be evidenced in the formation (transformation) of metropolitan regions into dynamic entities facing up to the challenges of the "new economy" – new in the sense that it is information technology based and global. A good example of this is in Northeast Ohio (incorporating Akron) where the public and private sectors from different counties and municipalities are collaborating with each other in generating new businesses, and exporting their goods and services to many parts of the world. (See paper of Kidder and Attwell in this book).

In Europe, the resurgence of the notion of "region" can be seen as a political strategy to deal with the development of a multi-cultural, and economically and socially cohesive European Union, (see the contributions of Nyhan and Rauner in this book). A regional or local focus can also be seen as offering a practical co-operation framework for the business development of small enterprises. In Europe, there are numerous examples of inter-regional co-operation in the economic, cultural, educational and environmental areas crossing national state boundaries. Many of the pilot schemes being supported by the educational, economic and social development programmes of the EU are described in the papers in this publication.

Perhaps the driving forces behind the move towards regionalisation is the belief that it is through creating self-directing and outward-looking communities (capable of harnessing traditional strengths – cultural, economic, educational and technological – with new thinking), that effective and flexible units can be formed both to compete in the global market and ensure that the human needs of all the citizens in a region are not overlooked. Regions are small enough to be flexible and manageable, but also big enough to flex their muscles on the national and international stage.

The education and training sector is playing a strategic role in regional development. Innovative community-oriented education, training and development agencies (and perhaps more importantly, groups of educational and development bodies, comprising public and private interests and in some cases forming a consortium) are beginning to play a major role in these developments. On the one hand, educational institutes are acting as catalysts for the production of new ideas, and on the other hand, they are acting as

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[3] About 20 innovative regional learning projects from the 15 Member States of the European Union were represented at the Forum. Over half of those projects participated in the Leonardo da Vinci Vocational Training Programme, co-ordinated by DG XXII of the European Commission. Other projects were from the Adapt Programme funded and managed by DGV (Employment, Industrial Relations and Social Affairs Policies) and the Interreg Programme which comes under the responsibility of DGXVI (Regional Policy and Cohesion).

brokers or mediators enabling different groups (public and private agencies, economic and socially oriented bodies) to begin to work together, developing the know-how to turn these ideas into reality. The community can achieve goals, which could not be achieved by the different bodies working alone. A theoretical model for this kind of education-led arrangement has being called a "learning region" in the EU – a concept that is outlined in many of the papers in this volume.

There are also many examples of businesses in the US and the EU becoming involved in community oriented programmes. Osterrieth,[4] who facilitated a session at the Forum dealing with the issue of disadvantaged groups in the workforce, found that there was a consensus among the US and the EU delegates about the following leverage factors, which can influence businesses to get involved in the recruitment of people from disadvantaged backgrounds, in the areas in which the companies are located. These are:

- the existence of a skill-shortage in the surrounding area;
- positive media coverage for the companies;
- appeal to ethical and moral responsibilities;
- public employment subsidies or incentives.

Sustainable infrastructures and robust instruments are required

Many of the participants at Akron spoke about the importance of building new structures, which have well designed vertical (leadership) and horizontal (participatory) mechanisms to facilitate regional collaboration. From a public administration point of view, new governance approaches, which promote a sense of common purpose and identity about a locality among different interest groups, (business, public institutes and non-governmental organisations or civil society – the latter term being more widely used in the US), are called for. Hofmier's paper in this book discusses the well established and widely recognised participatory Swedish structures used in the implementation of "working-life" reform programmes, which receive substantial financial public support.

When viewed with hindsight, in particular after some notable successes have been achieved, it seems obvious that industry and education are natural partners in a regional context. However, the hard work that has to be undertaken in launching and maintaining such co-operation should not be underestimated. Glover's paper, which gives an account of the establishment of the Capital Area Training Foundation in Austin, Texas (set up as a broker between schools and industry to train semiconductor manufacturing technicians) illustrates the difficulty in starting up such ventures. Stahl points out that the changes taking place within large companies in breaking down the barriers between the different specialised departments, management and workers, and the establishment of "open-system" horizontal interfaces, can be seen as pointing the way for the different interest groups on the wider regional landscape.

Regional horizontal networking, of course, is much more complex than that taking place within a company. Among the principles for effective regional co-operation networking

[4] These points are taken from the report by Sylvie Osterrieth on "The Involvement of Disadvantaged Groups in the Workforce – a work group at the Akron Forum".

highlighted by Deitmer and Attwell in their paper are – building trust; having an internally driven network (i.e. not just based on external factors); the presence of a strong dynamic leader; and the utilisation of effective monitoring and evaluation tools.

Similarities and Differences – EU and US

There are many similarities between the European and American trends in regional development, in particular, regarding the growing co-operation between private and public (government) bodies. In this regard the public-private collaboration outlined in the paper of Ciseros and Weiss and illustrated in the paper of La Porte would be close to mainstream European thinking. The economic and political analysis of Mrs. Hilary Rodham-Clinton (1998) during her intervention at the Annual Meeting of the World Economic Forum at Davos in 1998, where she spoke about the need for democratic society to be supported by three legs – business, government and civil society – would echo the sentiments of many European leaders.

Nevertheless, despite certain similarities, there are also many differences, due to the different cultural assumptions and principles underpinning the political and economic systems in the US and the EU. The EU's policy of actively promoting economic and social cohesion throughout its states and regions, by means of its Structural Funds for Regional and Social Development, has entailed a massive intervention in regional development. By comparison, the federal and or local government support for the US regional development initiatives is on a much smaller scale.

In general terms, European regional projects have more of an overall integrated focus, addressing both social and economic goals, and with major funding from the public purse, whereas the US regional strategies tend to have either a purely economic focus in line with the needs of the private companies, or, on the other hand, a unique social orientation, dealing with severely disadvantaged groups (for example in the inner-cities) and funded in many cases by private foundations.

The US, of course, is confronted by different regional problems from that of the EU. With such low levels of unemployment – many regions such as Austin, Texas, have unemployment levels below three per cent – the objective of regional educational and labour market projects is to educate or locate skilled workers, whereas in Europe the issue confronting many regions is economic regeneration in the context of combating high unemployment levels. The challenge, in these circumstances, is to devise active labour-market policies, which will address unemployment while at the same time stimulating competitiveness.

Sennett (1998) reflects on the strengths and weaknesses of different kinds of political economies in the US and the EU. Using the terminology coined by Albert (1993) in his book "Capitalism Against Capitalism", he contrasts the European continental "Rhine" model of capitalism with that of the "Anglo-American" model. According to the former model, management and trade unions (social partners) share power, with the state playing a major role in (vocational/professional) education and health care, while providing a safety net of unemployment benefits for those who lose their jobs. This model has existed for nearly a century in the Netherlands, Germany and France. In many respects it has also

been adopted by the Scandinavian countries and Italy, and also Israel and Japan The second model, which mainly applies to the US, but also to the UK in many respects, gives free reign to market capitalism and stresses the state's subordination to the economy and thus puts less emphasis on government intervention.

In summarising the advantages and disadvantages of these two systems, Sennet points out that while the American regime has full employment but increasing wealth inequality (to the detriment of what the Europeans would refer to as "social and economic cohesion") the European "Rhine" model with its sensitivities to social questions and to the needs of ordinary workers, is seen to impede job creation, leading to high levels of unemployment. (An illustration of the differences in the cultural values and assumptions underpinning the political and economic systems of the US and EU manifested itself at the Forum in the difference in terminology used to describe those who lose their jobs – US participants called them "dis-located workers", while European delegates referred to them as "unemployed workers".) These two political and economic systems reflect different definitions of the common good.

Actions inspired by the Akron Forum – a basis for continuation of transatlantic exchanges

The Akron Forum provided the opportunity for those EU and US bodies focusing on education and training in a community-building context, to discuss their experiences. It brought together actors from many different fields, many of them not normally associated with education and training in the traditional sense, but sharing a common belief in the importance of learning as a force for economic and social innovation in a regional development setting.

Notwithstanding the differences in traditions, there was a great interest among participants in learning about and discussing each other's projects. The European delegates were grateful for the opportunity to meet with leading players in regional and local learning initiatives, and also appreciated the study visits on the first day of the Forum. During the workshops they gained a good overview of economic and educational innovations in the US. The US delegates felt that they learnt much about the workings of the EU and expressed an interest in hearing more about how links are established between the regional and education and training policies of the EU, and how the economic and the social objectives can be addressed together in an education and training framework. However, taking into account the great differences between the EU and the US contexts, and the complexity of the subjects being discussed, this exchange can only be seen as a starting point.

Regarding the fostering of transatlantic regional partnerships and other follow-up actions, not least of which has been the collaboration in producing this book, a number of seminal partnerships began to emerge. The Akron-Chemnitz partnership has been strengthened and new links have been established between Akron and Bremen in Germany. Links have also been established or strengthened between Antrim in Northern Ireland and Philadelphia, and between Austin, Texas and Koblenz, Germany which will complement

the activities supported in the framework of the EU/US Joint Consortia Partnership Programme in higher education and vocational training.

This book – the "Akron Reader" – can be seen as another step taken in the promotion of EU-US dialogue through outlining some of the most interesting (although by no means a full representative sample of) regional projects in the EU and the US. Perhaps its main contribution is the provision of theoretical and practical insights into developments in this field and the depiction of emerging trends. Thus, it points the way for future dialogue and research.

Structure of this book

This book has three parts, each part beginning with a short introduction to the papers in the section.

Part One is entitled ***"Regional Development and Learning in the EU and US: the Context"***. This section, which has six papers, provides an overview of the political, economic, educational and social objectives, that are driving regional development. It also discusses, in a theoretical way, the open-system and network-type structures and mechanisms, seen as prerequisites for the successful implementation of regional development policies.

Part Two has the title ***"Regional Case Studies – Theory and Practice"***. This part contains five case studies presented in relation to their theoretical and/or political contexts. The first three of these papers examine how infrastructures, based on co-operation between private, public and non-governmental organisations, have been put in place to deal with educational, economic and employment challenges. A unique feature of the fourth paper is the emphasis placed on dialogue and communication models as instruments for human development and learning in regional settings. The final paper rounds off this section in that it attempts to address the question to what extent the Boston metropolitan area can fulfil the criteria of a 'learning region' from both the economic and social points of view.

Part Three is entitled ***"Descriptions of Regional Projects"***. This part contains four papers providing overview pictures of projects, which are in different stages of development. The first paper deals with a project for disadvantaged young adults. The second and third papers examine issues dealing with the reform or development of structures and curricula for the initial education and training needs of young people about to enter their first jobs. The final paper examines initiatives concerned with the provision of information, training and consultancy to those at work.

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Sennett, Richard, (1998) The Corrosion of Character – The Personal Consequences of Work in the New Capitalism, W.W. Norton and Company, New York.

Introduction to Part One

Regional Development and Learning in the EU and the US: the Context

The six papers in this first part of the book, give a picture of the political, socio-economic and educational background within which the trend towards regional-based initiatives has taken place in recent years. As well as examining the goals, needs and social challenges being addressed, this section also discusses some of the mechanisms, such as co-operation and learning structures, that need to be in place to allow regional innovations to be implemented.

The first two papers by Nyhan and Ciseros and Weiss provide overviews of the state of play in regional development in the EU and the US. These papers, however, look at the issue from different perspectives. The paper of Nyhan, entitled "Regional Development and Learning in the European Union", outlines a number of broad trends which began to emerge in Europe during the 1970s, such as movements towards autonomy in the economic sphere in a number of regions and the introduction of regional policies by the EU, in the late 1980s, to promote equality and social cohesion throughout European society, in the light of deepening economic and political union. The manner in which educational and training agencies are contributing significantly towards this process is focused on. The paper of Cisneros and Weiss, entitled " Economic Growth of Metropolitan Regions in the United States", differs from that of Nyhan in that it is based on a quantitative study of 114 of the largest metropolitan regions in the US. It provides a comprehensive picture, with plenty of illustrations of how many of these regions are transforming themselves, moving from manufacturing-based to information-based economies. This radical shift is being driven by the need to respond to new technology and globalisation.

Even though, the next paper by Kidder and Attwell, entitled " A US-EU Partnership – Northeast Ohio and Southwest Saxony, Germany", is a case-study, and would appear to be more suitably placed in another part of this book, it is introduced here because it illustrates a very interesting example of a partnership between a region in the United States and Europe. This partnership, indeed, demonstrates how different parts of Europe and the United States have been linked together through close historical ties are beginning to renew their close connections in the context of the global economy.

The next two papers, the one by Stahl entitled "Stimulating Regional Innovativeness: The Learning Region" and the paper of Deitmer and Attwell " Partnerships and Networks: A Dynamic Approach to learning in Regions", can be seen as a pair. Stahl's paper, as well as outlining the way in which regional cooperation between HRD institutes and enterprises can promote economic development, also treats of the open infrastructures and ways of interacting which are required to allow different "reference groups" to work together in devising innovative solutions. The paper of Deitmer and Attwell, complements the paper of Stahl by going into more detail on the types of partnership and network arrangements

necessary at the meso and micro levels to produce joint learning and the development of collective know-how for knowledge production and innovation.

The final short paper by Rauner entitled "The Competitive Advantage of Nations", can be seen as a kind of concluding statement to Part One, outlining some of the central European values and principles underlying regional development strategies. This paper is primarily addressed to an American audience with the view to laying the ground for further mutual learning between the EU and the US.

CHAPTER 1

Regional Development and Learning in the European Union

Barry Nyhan

This paper gives an overview of trends in Europe in the field of regional development. It shows how new approaches to education and training have emerged, to promote economic and social goals in regional and local contexts, making for the possibility of what are termed "learning regions". The paper firstly looks at the movements towards greater local autonomy, mostly based on a mixture of economic or cultural influences, which have been present in Europe for the past 30 years. Secondly, it examines the manner in which the European Union introduced its regional development policies, over the last 15 years in particular, to promote economic and social cohesion throughout all the areas of Europe, becoming increasingly more integrated politically and economically. Thirdly, the way in which a community-orientated education and learning policy can become a catalyst for regional development, in what are called "learning regions", is examined. Finally, the paper discusses how inter-regional learning and co-operation partnerships are seen as a way to build what has been termed a "Europe of the Regions".

Trends towards greater regional autonomy

In the 1970s, when the European nations had had sufficient time to recover from the trauma of the Second World War and democracy had been restored to all western European countries, there was a desire in many regions to manage their own affairs independently (or more independently, depending on their constitutional status), and establish trading and cultural links with other regions[5]. This was the time when a degree of economic prosperity was restored to great parts of Europe, and the benefits of the social and educational policies of the welfare state introduced after the Second World War, were beginning to bear fruit. Political stability, an emerging economic prosperity and the wish to draw on historic cultural resources, gave people the confidence to devise social and economic innovations based on local or regional co-operative initiatives.

An illustration of this, in the economic domain, is the emergence of clusters of small industries in the same locality, co-operating *and* competing with each other, in producing goods for specialised world markets in sectors such as clothing, textiles and footwear. The best known of these initiatives, which began in the early 1980s, can be found in the northern part of Italy (in particular in Emilia-Romagna), where small specialised and flexible companies, operating in what became known as "industrial districts" began to make an impact on world market niches. (Cooke and Morgan, 1991, Putman, Leonardi and Nanetti, 1993; see also paper by Dondi in this book). Similar, although less well

[5] It must be kept in mind, however, that there is no one definition of a region within the EU. It can mean an autonomous region with its own government such as in the Federal Republic of Germany or can refer to a locality or territory with much more limited decentralised powers as is the case in the UK, or even an area which is taking actions to achieve a certain degree of autonomy.

known, developments can be found in west Jutland in Denmark, Valles Oriental in Spain, Baden Wurttemberg in Germany, Oyannax and Cholet in France and Southwest Flanders in Belgium (Farinelli, 1996).

These clusters of firms, according to Farinelli (1996, p.14) comprise "numerous closely interacting small and medium-sized companies, devoted to one predominant manufacturing activity, located in a relatively confined geographical area, producing for the same end markets (whether directly or indirectly) and with a specific cultural environment created through shared knowledge and values. A district's strength lies in *clustering and co-operative competition* (author's italics) together with the industrial atmosphere created by a mix of competence, skills, entrepreneurial ability, trust, and a sense of community, which together open up the possibility of gains in terms of efficiency and flexibility which individual producers can rarely attain working alone".

Piore and Sabel (1984) in one of the first studies of this co-operative industrial strategy, as it emerged in northern Italy, coined the term "flexible specialisation" to describe these firms' ability to respond to a variety of highly diversified and sophisticated orders. This is related to a capacity to bring together the different ingredients of human competence, appropriate technology, suppliers and infrastructure, at the local level, at the correct time and in an appropriate way. With the arrival of the information and knowledge-based technologies, instead of witnessing a decline, these territorial-based clusters have in fact demonstrated their "flexible specialisation" even further through tackling more technologically demanding sectors such as ceramics, plastics, metalworking and industrial automation (Farinelli, 1996). In more recent times the trend towards regionally driven initiatives has been fuelled by a concern to respond to globalisation in the economy, and the related developments in information and communication technologies which are pushing globalisation at an even faster rate

Although this spirit of "clustering and co-operative competition" is created primarily by owners of the small enterprises themselves, strong support is provided by the local public authorities and the national government. This is especially so in regard to infrastructural, educational and training, and research and technological development, matters. Thus, Brusco cited in Farenilli (1996) maintains that such districts will go into decline if the above forms of public support are not forthcoming. Indeed the role of local government in mobilising the natural talent of the community, rooted in historical, cultural and family ties, is an essential ingredient in the recipe for success.

Difference between regional and national economies

The example of the "industrial districts" outlined above, illustrates how "internal flexibility" can be generated in a region through an appropriate mix of entrepreneurial and public endeavours. Krugman (1997) attempts to explain how regional economies differ from national ones and why they can be more dynamic. Basing his arguments on the concept of "external flexibility", Krugman in the first place states that the economy of a region is far more open to, and dependent on external trade than that of a nation. Because internal markets are smaller than national ones, regions have to sell to outside customers if they are to grow economically. The second major difference between a region and a nation,

according to Krugman, is that labour moves much more freely into and out of a regional economy than in most national economies.

Even though one may question the validity of the "external flexibility" basis of his argument in an overall European context, Krugman does identify two salient points concerning the differences between regions and nations, which when rephrased, apply to the European situation as well. These are that the potential economic advantages of a region vis-a-vis a nation lie

- in its cohesiveness and manoeuvrability in being able to target high value-added external markets and
- in the high competence profile and versatility of its workforce, which gives it the capacity to deliver the required goods and services for these markets.[6]

European Union Regional Development and Social Funds

The decisions taken in the mid 1980s to fully implement the Single European Market and to opt for deeper levels of political, including economic and monetary union, entailed that Member States surrender their sovereignty in many areas to the Union. This necessitated giving assistance to the weaker regions if they were to participate as equals in a stable and strong Europe, to use the official terminology – "an economically and socially cohesive Europe". The instrument for giving this assistance was the European Structural Fund, divided into the European Regional Development Fund targeted at physical infrastructual projects, such as transport and communications, and the European Social Fund focused on social projects, in particular dealing with education and training.

Affluence is unevenly spread in Europe. The most affluent part is concentrated in a banana shaped area stretching from London in the north, to Milan in the south. The further away one is from the "dynamic centre" the lesser one's chances to grow economically. Disparities between regions (sometimes even within the same country) can be much greater than those between nations. To illustrate this, it was found in 1991 that the average GDP per head in the 10 least prosperous regions was over four times less than that of the 10 most prosperous regions, and unemployment seven times greater

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[6] Krugman's reflection on this topic is prompted by his effort to understand the factors underlying the recent success of the Irish economy. He illustrates his argument by comparing the Boston region (the Boston metropolitan area) in the US with Ireland. In terms of size, Ireland with a population which is only about two-thirds of that of the metropolitan Boston area, and in terms of its openness and dependence on trade (exports for Ireland are about 80 percent of GDP and some seven times the ratio for the US), has an economy sharing more common features with a region than a nation. (Wales has been described by Morgan (1991) as a 'regional state'). Ireland's recent economic success could be explained by the fact that it is behaving after the fashion of a dynamic region with growth driven by its export base and its flexible labour market. In addressing the issue of 'labour mobility' which he sees as the crucial difference between a region and a nation, he states that the difference between labour mobility in Boston and in Ireland is that whereas workers may flood in and out of Boston in times of growth and move out as recessions hit, Ireland's long tradition of emigration coupled with the fact that it shares a common language with the UK and the US means that the size of its labour force is much more responsive to economic conditions than in other countries. Further, the surplus pool of labour that could be drawn from the ranks of the unemployed, had much the same effect as if the economy were able to draw workers from other regions. Krugman qualifies this statement by saying that it is going too far to think of Ireland as if it were purely a regional economy, and that the kinds of macroeconomic features applying to bigger national economies also apply to Ireland. However, one may also question the emphasis Krugman places on external labour flexibility as an explanation for Ireland's growth. What he seems to be forgetting is the successful marrying of government industrial development policies based on attracting direct foreign investment and linked public policies regarding investment in education and training to create a well educated and responsive pool of labour.

(European Commission, 1991 and 1996). Within the context of the wider implementation of the Single European Market, these differences further handicap the weaker regions. In order to avoid a two-speed Europe, the Regional Development Fund and the Social Fund were greatly strengthened in the late 1980s to facilitate economic convergence between the strong and weak regions.

The scale of some of the problems in the poorer regions, combined with the fact that many Member States were cutting back on their own regional support programmes, in the interest of meeting the current budget deficit criteria and low inflation levels necessary to join the European Monetary and Economic Union, meant that the European Union as a whole had to intervene to even up the imbalances between the richer and less prosperous regions. Substantial subsidies were given to the less well off regions [7]. This was based on the principle that, in an open global economy, which imposes increasing constraints through the need for competitiveness, it is unlikely that open-market forces alone will ensure balanced development between the regions. According to Jacques Delors, one of the architects of this policy – "there can be no social progress without economic progress and no economic progress without social cohesion". (See the so-called Delors White Paper: Growth, Competitiveness, Employment – The Challenges and Ways Forward into the 21st Century – European Commission, 1993).

These regional support policies, which were pursued during the latter part of the 1980s and right through the 1990s, demanded the setting up of local co-ordination committees to devise and oversee regional programmes for economic, social and educational objectives. The committees gave a great impetus to the concept of the region as a practical reality. In planning the multi-annual programmes, leading actors – including all interest groups, public, private and non-governmental agencies within a region – were compelled to work together (and learn together) to produce practical results over a short time period. The need to have trans-regional co-operation on a European level in certain of these projects meant that the regions learned how to set up and manage new economic and cultural links. Thus, the trend towards regional autonomy, which was taking place in any case as outlined in the early part of this paper, was complemented and got a further stimulus through the EU policies introduced to promote cohesion throughout all European societies.

Regional education and training initiatives – the Learning Region

The role of educational and training initiatives in a regional context has been mentioned a number of times in this paper so far, reflecting the emphasis on education and training and human resource development in European policies both at the Member State and EU level. Innovative community focused educational and training initiatives have a key role to play in equipping people with the insights and the competencies to design and create new ways of living and working to meet their needs in the regional context. However, education and training strategies, which fit the needs of regional innovation and development such

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[7] 141.5 billion EURO (or about 167 billion Dollars) were allocated by the EU for this purpose between 1994 and 1999 (Office for Official Publications of the European Communities, 1996). This represents more that a third of the EU's total budget.

as in the "industrial districts", discussed above, are very different from traditional education strategies.

Traditional education and training activities tend to deal with the development of individuals as individuals. The emphasis is also mainly on formal or theoretical knowledge. Regionally focused education and training initiatives, however, concentrate on community oriented learning activities carried out in partnership with other groups and undertaking activities not normally associated with the role of education and training agencies. The creation of partnerships in which the various educational, social and economic agencies "transcend their differences and combine forces in favour of a joint strategy" is crucial for the success of regional learning initiatives (See Walsh, 1994, cited in Rees, 1997, p.12).

Such partnerships, which have taken the form of a consortia (made up of interdisciplinary teams, combining private and public interests) in the cases of the Italian, German, Danish and Belgian industrial districts, can provide guidance in areas such as: the implementation of new technologies; problems arising from company growth, and competence development and training. They can also act as an interface between the local situation and the global environment, in particular through "interpreting the codified knowledge made available by the new technologies and matching it to the tacit knowledge of deeply rooted cultures" (Farinelli,1996, p.19)

In the context of initiatives focusing on broader social as well as economic objectives, regional learning initiatives entail empowering local communities, through the involvement of people from different interest groups, to enhance their living standards and quality of life. In this context, according to the research undertaken by Rees (1997), development is a collective process in which organisations and individuals with different goals come together to produce an outcome that is in the interest of all concerned. In the same vein, the place of indigenous development and innovation leadership must be taken fully into account, with " top-down structural change and bottom-up development forming a dialectic in which local and regional development is bolstered" (ibid, p.11).

Successful partnerships, therefore, reflect local circumstances and are not imposed or developed according to some standard model. Indeed a strong partnership, arrived at through a systematic consensus building process, is one of the most important eligibility criteria for the receipt of funding under the auspices of the EU programmes. The importance of the partnership notion in providing innovative models for widening participation in change processes within local communities, and giving practical expression to the concepts of private-public partnership and area-based programming, has been noted in an OECD report on local partnerships and social innovation (OECD, 1996).

A region in which an education and training agency (or agencies) is playing a leadership role, along the lines just discussed, is fulfilling some of the criteria of what can be called a "learning region". According to the theory of the learning region (see Stahl, 1994 and in this publication, and Koch, 1994), learning is seen as a "system-orientated" rather than an "individual-oriented" activity. The essence of "systems oriented" ("systems thinking") approaches lie in seeing causal relationships between things, (that is between the external and internal environment, and within the internal environment) rather than linear cause

and effect chains (Senge, 1990 and Morgan,1986). A learning region is constantly "looking-out" at the external environment, while also at the same time "looking-in" at its own system, trying to understand how the external and internal are interacting with each other.

The educational agency in the learning region also pays attention to the interdependence of the different aspects of learning – economic, technological, social and human knowledge and competence – and attempts to bridge theoretical and practical knowledge. To assist this process the educational and training sector adopts an approach of "going-out" to enterprises, (particularly small and medium sized one) and community groups, and working with them on tailor-made learning approaches, which integrate organisational and individual development. The formal ways in which people learn are thus reinforced by a form of learning which is embedded in everyday events, so that work and life routines become opportunities for learning.

The experiences of companies, which have introduced new management and learning approaches along learning organisation lines, can throw light on how the principles of the learning region may be implemented. In an effort to achieve greater efficiency, many companies have moved in the direction of flatter organisational structures with autonomous work groups. Learning is embedded in this process, taking place in the problem-solving environment of the workplace. This complements formal learning. The role of the training department in this context shifts towards a catalyst role rather than a direct training one, assisting the different workers to pool their experiences and thus, through their own efforts, generate new knowledge in "knowledge-creating companies" (Nonaka and Takeuchi, 1995).

Addressing the needs of everybody living in a Region

The EU has been preoccupied in recent times making preparations for Economic and Monetary Union, which came into being at the beginning of 1999. However, it is equally well recognised that current economic models are not sufficient to deal with the complex political and social challenges facing regions, and indeed modern society in general. The purpose of the economy is to contribute to the creation of a community, which respects human values, in particular, social justice, and guarantees the fulfilment of all its citizens. A region must be seen as a social system as much as an economic system.

The principles of the open global market have pervaded all aspects of social life, creating constant change and promoting personal insecurity for many. Globalisation has entailed "short-term" ("flexible") work contracts and the frequent downsizing of companies, in the interest of creating so called "lean organisations", or the movement of investments elsewhere in the world. In this environment, where people often feel that they are disposable, community-oriented initiatives can assist people who are caught up in difficult transitions and indeed in many situations can provide safety nets to ensure that people who temporarily drop out of the economic system are not left behind. A regional approach can also give people a sense of community, enabling them to find meaning through co-operation with each other, and pooling resources. In an era of perpetual change and "virtual reality" (in the information technology sense) the stability of a community with a

history, and physical groundedness offered by "place" becomes important. A community evokes the social and personal sense of place, and place becomes a community when people use the pronoun "we" (see Sennet, 1998).

The community or region, however, should not seen as offering facile solutions to the major problems confronting people in their work and in their life. Sennett (1998, p.143) in particular is critical of "communitarianism" which he feels "falsely emphasises unity as the source of strength in a community and mistakenly fears that when conflicts arise in a community, social bonds are threatened". He goes on to state that the "communal we" is far deeper than the often superficial sharing of common values such as appears in modern communitarianism.

Inter-regional learning as a means to build a Europe of the Regions

While there has been an upsurge in regional autonomy in Europe, at the same time regions are situating themselves in a European context. This has given rise to the term of 'Europe of the Regions' a concept that has gained a degree of political substance with the establishment of the 'European Committee of the Regions' in 1992. This is a statutory Committee with a consultative role in passing European legislation.

In the building of the European Union, therefore, emphasis is placed on inter-regional partnerships as a foundation for greater political and deeper union. So, policies on regional development have focused not only on local development within the confines of one geographical area, but also on inter-regional co-operation and learning across different areas of Europe. This is to respond to the issue, mentioned earlier of the growing interdependence of regions in a unified Europe, requiring closer co-operation and indeed common policies in many aspects of political and economic life.

The purpose of the different education and training programmes such as the Leonardo da Vinci programme is to promote some of the following objectives:

- sharing experiences;
- mutual learning;
- undertaking joint projects which have a trans national or European focus;
- building Pan-European conceptual frameworks and models;
- knowledge-transfer;
- critical reflection on one's own tradition through engaging with other traditions.

From a wider international economic perspective, Arrow (1997) makes the point that significant knowledge transfer can take place through foreign trading activities. He goes so far as to say that "it is in the acquisition of knowledge from abroad that foreign trade and investment assume their greatest economic significance"(p.6). This fact is often ignored by countries or regions which are looking primarily at short-term financial benefits resulting from foreign investments, whereas the longer-term knowledge accumulation or the learning of expertise have far greater consequences. The transfer of knowledge which takes place in these circumstances, but also in other types of close international collaboration or partnerships, is a unique process in that a region passing on the

knowledge is expanding the knowledge base, in the sense of allowing it to be reinterpreted to meet different circumstances. Knowledge, therefore, is a unique resource, in that, unlike physical resources, it is not used up, but can constantly grow.

A prerequisite for successful knowledge transfer, however, is what economists call the "absorptive capacity" within a country or region. (Learning theorists would refer to this as a "learning capacity"). An absorptive capacity should not be interpreted just in the passive sense, however, as it is intrinsically linked, according to Arrow, to the receptor country or region's ability to perform research and development at a high level. This again entails a long-term perspective on developing sophisticated and "smart" infrastructures for learning and research. It is not just a question of imitating the methods and processes adopted by the external agent. In this regard, the word "transfer" which is commonly used is not the most appropriate one, as it lends itself to this passive interpretation. While the first stage in learning and research, is gaining a thorough picture and theoretical understanding of how an "external expert" carries out an operation, in-depth learning involves building on these insights to devise innovations which meet the needs and environment of one's own cultural situation (in the economic and social sense). Learning and research giving rise to significant and lasting results, therefore, is built on, and fully utilises the innovative capacity and distinctive strengths of the people living in that cultural environment.

Of course, inter-regional exchanges inevitably bring up the issues of culture clash and a tendency to defend one's own tradition. Learning and development, however, requires open minds. This must include the possibility of critical reflections on one's own tradition. It is true that "all traditions at some stage come up against their own internal contradictions and tensions. When these become serious, and when the adherents of a tradition themselves come to recognise a crisis, progress is possible through a critical engagement with other traditions." (Horton and Mendus, 1996, p.12) Although such engagements can create even greater feelings of uncertainty, they can also offer the adherents to a tradition a way of reforming their tradition, and also begin to resolve tensions between rival traditions.

In terms of the creation of a European Union (and in particular a Europe of the Regions) it is inevitable that there will be confrontation, conflict and confusion. Panaceas do not exist in the larger European community domain. Through dealing with conflict and accepting paradoxes, however, communities and regions, unequal in terms of political and economic power and with differing interests, have to work harder at communicating, and perhaps learn how to listen and respond to each other. In that way, even as they keenly feel their differences, they may begin to build more durable connections with each other.

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CHAPTER 2

Metropolitan Economic Strategy for America's Cities and Regions

Henry G. Cisneros and Marc A. Weiss

The New American Economy

After a quarter-century of sweeping change in the global economy, the metropolitan regions of the US are positioned for prosperity. Metropolitan regions have been centers of manufacturing and commerce since the beginning of the industrialization and urbanization of America in the 19th century. In more recent years, the new knowledge and information-based, technology and communications-intensive, globally oriented economy has changed the economic dynamic of metropolitan regions. Some regions have prospered as centers of the New Economy by growing new types of service industries – business, professional, financial, health – and by spawning whole new manufacturing sectors – computers, electronics, telecommunications, multimedia. Other regions have become more competitive by transforming older manufacturing industries, such as automobiles or apparel, into more productive, technology-driven industry "networks".

Our study, based on evidence from case studies of 12 U.S. metropolitan regions and analysis of quantitative data on 114 of the country's largest metropolitan regions, finds that most U.S. metropolitan regions are freshly positioned to succeed in the new global economy and to bring increased prosperity to America's families and communities in the 21st century.

The New Economy Has Arrived in America's Metropolitan Regions

For years, academics, futurists, and other observers of economic change have argued that our society is entering a major period of economic transition. Now, we can say that this change has occurred and the "New Economy" has arrived in America's metropolitan regions. The U.S. is moving from a manufacturing to an information-based economy.

Figure 1: Key Dimensions of Economic Change

Key Dimension	Old Economy	New Economy
Major source of productivity gain	Better and more efficient use of energy and raw materials	Better use of knowledge, information and technology
Trade patterns	**National**	**Global**
Successful development strategies	Protectionism, import substitution	Free trade; producing for global market; metropolitan economic strategies
Geographic dimension	Company or industry towns with little diversification or clustering	Metropolitan networks of complementary firms and industries

Two fundamental forces – new technology and globalization – are driving the transformation to the New Economy, a process that began in the 1970s. Figure 1 shows some important differences between the "Old" and "New" economies.

Technological change is the first key force behind America's economic transformation. One of the most striking features of the New Economy is the emergence of whole industries engaged in the production and distribution of information. This change is not confined to the growth of specific industries like computer equipment manufacturing, software design, fiber optics, or communications media; it is increasingly found across a wide array of business activities in every industry.

The second key force behind America's economic transformation is globalization, evidenced by increasing international trade and cross-border investment. International trade has accounted for a rising share of national production for many years, in the United States and most other advanced industrial countries. Many factors contribute to globalization, ranging from relatively peaceful international relations since the end of World War II, massive technological change in communications and transportation, to increasing recognition that long-term economic prosperity involves exporting goods and services to markets beyond local and even national borders. The rise of international production and distribution networks means that successful economies often have high levels of imports and exports.

While technological advances and globalization of production and trade have been good for economic growth, the exposure of many manufacturing industries all over the world to international competition has led to significant industrial restructuring. Some of the most prominent examples are the global success of the Japanese consumer electronics industries, the recent rise of China as a major exporting nation, and America's success in semiconductors, advanced business services, and recently, automobiles.

As global competition increased in the 1970s and 1980s, many American manufacturing firms found themselves less competitive, leading to declines in both employment and world market share. Today U.S. manufacturing has become far more competitive, but the rules of the game have changed for American manufacturers. In the New Economy, U.S. manufacturing companies increasingly make use of information and technology to develop and build new, higher quality products. This requires innovating at every stage of the production process, from design and engineering to distribution and service delivery. This push for higher quality brings with it demand for higher skills and higher technology resulting in higher "value-added" and higher incomes. In the New Economy, there is a dynamic interrelationship between the information and services sectors and renewed, competitive, U.S. manufacturing industries.

Metropolitan Regions: The Building Blocks of the National and Global Economy

In the past, policymakers looked purely at national statistics to measure economic performance. Macroeconomics, as its name implies, focuses on the big picture, the nation-state. However, today it is increasingly recognized that a fundamental building block of national economic prosperity is the wealth and prosperity generated by

metropolitan regional economies. In America today, nearly 80 per cent of the population and almost 90 per cent of job growth is located in metropolitan regions.

All over the world, growing nations are led by growing metropolitan regions. Japan's post-war growth was led by industry in the Tokyo-Osaka region. China's development was first spearheaded by the southern region of Guangdong and more recently accelerated by development in the Yangtze River Valley. The United States benefited in the 1980s and 1990s from the successes of its technology regions – Silicon Valley in northern California, Research Triangle in North Carolina, and Route 128 in New England. These three U.S. regions, and numerous others, are global leaders in broad-based applications of new technology. More recently, the renewed strength of many Midwestern metropolitan regions – the competitive comeback of America's industrial heartland – has led to substantial increases in U.S. exports of goods and services.

From Narrow Industries to Broad Industry Networks: The New Economy and the Economic Structure of Metropolitan Regions

As the nation's economy has shifted from old to new, the dominant pattern of industrial organization has changed. This is a major reason why America's metropolitan regions have become more competitive in the past few years. Whereas before, the old economy gave rise to many undiversified regions and "company towns", often dominated by one or a few large corporations, the New Economy requires greater specialization of skills, technology, and services at the advanced end of manufacturing. U.S. firms are now highly competitive in the New Economy. This trend towards greater specialization is evident in metropolitan Detroit. In the old economy, it was enough for Detroit to manufacture cars. But, in the New Economy, metropolitan Detroit no longer simply assembles most of the world's cars. Instead, it is the world capital for automobile research and development, engineering and design. Today, Detroit's global exports are not just cars and trucks. Now, it is the workers of Detroit, experts in making better automobiles, who are exporting their consulting services, ideas, engineering plans and manufacturing technologies throughout the world.

At the same time as businesses are becoming more specialized, they are also taking steps to become more flexible in order to improve efficiency and respond more rapidly to market signals. Today's business organizations are less hierarchical and often perform a less highly integrated set of functions than before. Instead of giant corporations doing everything "in-house", businesses now depend on close relationships with related firms to carry out vitally necessary activities. As a result, metropolitan regions must, and are, becoming more diversified. Diversification means creating groups of businesses within a region which all work together dynamically around central specialties. In metropolitan Detroit, to continue the example, business activity covers everything from conception to sale of automobiles and trucks. Such activity includes: industrial parks where research and design of new cars are conducted; computer companies creating software programs specialized for automobiles manufacturing; universities training automotive engineers; marketing and distribution companies; and supporting financial institutions and insurance agencies. More than anything else, the New Economy demands *close connections*

between these related sets of businesses and between public and private sector institutions. Close connections are fostered by geographic proximity of firms often located within the same metropolitan region.

Groups of complementary firms and industries that settle together in the same place are called *Industry Networks*. In the U.S., most industry networks are located within metropolitan regions. Metropolitan "clustering" gives the many individual firms within each industry network diverse opportunities for close access to specialized suppliers, which help increase speed and flexibility in responding to changing market conditions. Metropolitan industry networks are the engines of growth in today's regional economies. A metropolitan region's ability to grow and prosper in the 21st century depends on its capacity to shift to the New Economy by retooling to promote high value, knowledge and information-based, technology and communications-intensive activities, within each industry network.

Industry Networks Drive Metropolitan Economic Prosperity in the United States

Economic growth and prosperity in America's metropolitan regions today are being generated by 18 major industry networks, shown in Figure 2. A majority of all jobs in the American economy are in these 18 industry networks. While industry networks take different forms in each metropolitan region, across the nation they share similar patterns of relationships among business firms.

Together, these 18 industry networks constitute 54 per cent of total U.S. employment. They were defined by examining dynamic national relationships of the sales of goods and services among major U.S. industries. The industries in a particular network are those that share common suppliers and markets. They are also, by and large, those industries that produce goods and services for export, either exporting within the U.S. between metropolitan regions, or exporting internationally.

Industry networks mainly concentrate in metropolitan regions. The relatively high regional employment and export orientation of network-related businesses and industries help to fuel economic growth and prosperity by bringing new wealth into metropolitan regions. Examples of leading regional industry networks are Transportation Equipment in metropolitan Detroit, including auto assembly facilities, parts manufacturers, and machine tool suppliers: Financial Services and Printing and Publishing in metropolitan New York; Electronics and Communications plus related Business Services in metropolitan Austin; Entertainment and Tourism, along with Transportation and Trade Services in metropolitan Los Angeles.

Figure 2: America's Industry Networks: Selected Economic Indicators

Industry Network	Net Employment Change 1975-95	Avg. Annual Employment Change 1991-95	Change in Real Value Added per Employee 1975-95	Change in Real Wages 1975-95	Avg. Wages & Salaries per Employee 1995
Business & Professional Services	163%	2.5%	-32%	16%	$33,399
Health Services	132%	3.6%	-29%	13%	$30,382
Entertainment & Tourism	115%	2.6%	13%	-2%	$14,478
Financial Services	61%	0.3%	16%	34%	$41,016
Housing & Construction	49%	0.6%	0%	-9%	$30,738
Medical Products	45%	-0.4%	66%	16%	$43,956
Transportation & Trade Svcs.	41%	2.0%	40%	-16%	$32,095
Industrial Supplies	31%	0.9%	62%	2%	$36,427
Printing & Publishing	23%	-0.8%	3%	1%	$33,206
Electronics & Communication	15%	-1.3%	145%	14%	$40,324
Transportation Equipment	7%	2.9%	64%	8%	$41,548
Materials Supplies	2%	-0.3%	60%	3%	$32,103
Aerospace & Defense	-11%	-8.5%	54%	10%	$44,119
Agriculture & Food Processing	-17%	-1.5%	75%	18%	$24,441
Natural Resources	-18%	-3.7%	77%	9%	$43,076
Industrial Machinery	-20%	-0.1%	86%	-5%	$38,391
Consumer Goods	-23%	-0.9%	79%	12%	$37,796
Apparel & Textiles	-28%	-1.7%	117%	0%	$20,754

Source: Best available data and projections as of August 1996, U.S. Dept. of Commerce/Regional Financial Associates.

Changing Linkages between Cities, Suburbs, and Rural Areas

The distribution of economic activity in metropolitan regions has changed with the increasing significance of industry networks in the New Economy. During earlier phases of U.S. industrialization and urbanization, businesses and manufacturing facilities located in rapidly growing central cities to gain access to labor markets, customers, and centralized transportation facilities such as water ports and railroad yards. By the 1970s and 1980s, however, many of the city's manufacturing firms and other businesses were moving to suburban areas, attracted by lower land costs and improved truck transportation accessibility with the interstate highway system. Many other factories, stores, and warehouses, hit by the increasing competition of the global marketplace, left central cities for other U.S. regions, moved facilities to other countries, or simply shut their doors entirely and went out of business. Others hung on, but with fewer workers than in previous

decades. The abandonment of factories and resultant job losses in the nation's cities undermined the vitality of some inner city neighborhoods, pushing residents and businesses toward the suburbs.

The restructuring of American business to reflect the new global economy, combined with the emergence of metropolitan industry networks, has brought good news for America's cities. Their recent economic revival is based on much more than the general national economic upswing during the past few years. Today, cities have come through two decades of wrenching economic changes, emerging in a new and stronger position within the metropolitan and global marketplace.

In America's New Economy of the 21st century, unlike the American economy of 50 years ago, it no longer makes sense to divide cities and suburbs. Businesses are now closely linked within metropolitan regions, forming industry networks that operate across city and suburban boundaries. Within these industry networks, businesses have a variety of specialized needs that can only be filled through the economic diversity of the entire metropolitan region. Just as cities once grew by attracting businesses with their unique combination of economic specialization and diversification, now metropolitan regions perform the same economic functions. In this new metropolitan geography, firms within an industry network may be spread throughout a metropolitan region, but particular types of business activities tend to concentrate in certain areas. For example, development of advanced financial instruments or fashion design is generally conducted in downtown city offices, while "back office" data processing or basic manufacturing may occur in outlying suburban locations within the metropolitan region. This wide distribution of economic activity reflects cost differentials and access to skilled labor in different parts of a metropolitan region, and recognizes the competitive advantages of concentrated, specialized, and diversified business activities in central cities.

Cities play a series of essential roles as part of the larger metropolitan marketplace. Suburban growth cannot take place without urban economic vitality, nor can cities continue to thrive unless they are connected to metropolitan production and distribution.

Roles for Cities in the New Economy

Centers of Innovation and Advance Services: Cities bring together a specialized, highly skilled workforce that performs high value, knowledge and information-based, technology and communications-intensive activities in research, design, product development, marketing, legal, financial, engineering, and other key activities. In particular, new innovation-driven industries, such as multimedia, tend to concentrate in urban locations because of these dynamic interrelationships. Currently, the emerging multimedia industry is centered in New York's lower Manhattan, Los Angeles's West side, Chicago's near North side, and San Francisco's South of Market district.

Centers of Education, Research, and Health Care: America's cities are still the location of choice for universities, hospitals, and other research institutions. In urban settings, like New York, Detroit, St. Louis, or Los Angeles, these institutions have access to large consumer markets necessary for sustaining their high fixed operating costs. These institutions also benefit from the co-operation and shared problem solving made possible

by being located near each other. Furthermore, in many different types of metropolitan regions, university research and medical institutions serve as economic magnets for related industry network expansion in the city and throughout the region.

Centers of Culture, Recreation, Sports, Entertainment, Convention, and Tourism: With museums, theaters, festival marketplaces, convention centers and sports arenas, America's cities offer unique cultural and entertainment attractions. Today, most cities are making a comeback as recreational and tourist centers and international meeting places, both in leading destinations such as Washington, DC or Baltimore, and in emerging areas such as Nashville or Jacksonville.

Centers of Transportation and Trade: Even as more highways and airports are built on the metropolitan fringe, America's cities still contain major water ports, railroad terminals, and trucking hubs. Coastal cities, such as Los Angeles or Jacksonville, as well as inland cities like Columbus and Atlanta, serve as centers of metropolitan and international transportation and distribution networks. With the rapid expansion of regional and global trade, cities are becoming more sophisticated trading posts where transportation, logistics, and related trade services providers increasingly congregate.

Market and Workforce Centers: America's cities are home to millions of workers and consumers, providing metropolitan industry networks with major economic assets and business opportunities. Urban businesses can expand and profit by developing new products and services for specialized markets within cities, and they can utilize the skills and diversity of urban residents to strengthen the metropolitan workforce and fill newly created city and suburban jobs. Unfortunately, too many inner city communities are not well connected to metropolitan economies and are underserved by educational institutions and financial markets, hampering their economic vitality. To strengthen the traditional economic role as market and workforce centers, most cities are working to connect urban families with employment opportunities throughout metropolitan regions. Cities are improving metropolitan transportation and job placement networks, increasing access to child care and health services, and rebuilding neighborhoods with businesses, jobs, schools, stores, safe streets, and affordable homeownership.

Metropolitan Economic Strategy: Building Competitive Industry Networks

There are ten broad elements of economic strategy that regions can employ to support industry network development and improve regional competitiveness and prosperity. As metropolitan economies move from the old to the New Economy, metropolitan leaders are increasingly emphasizing these strategies. The range of strategies being implemented by regional leaders reflects the changing and increasingly complex resources needed for industry networks to grow in the New Economy.

The ten elements of metropolitan economic strategy are:

- Transportation and Infrastructure;
- Research and Technology;
- Education and Workforce Development;
- Financing;

- Business Development and Attraction;
- Trade Promotion and Market Development;
- Tax and Regulatory Policy;
- Environmental Preservation and Restoration;
- Economic and Community Revitalization;
- Quality of Life.

Metropolitan regions are pursuing tax and regulatory reform, business development and attraction, and trade promotion and market development to create an economic environment that encourages growth of new and existing business firms and industry networks. Regions are increasingly expanding and targeting investment in transportation and infrastructure, research and technology, education and workforce development, and financing, because these investments relate directly to the ability of industry networks to promote innovations and add value to new and existing products and services. Regions such as Austin and Akron built local research and development capacity to encourage the successful emergence of high-technology industry such as computers, semiconductors and advanced polymer materials. Many regions are focusing greater resources on education and workforce development because jobs in the New Economy require stronger technical and analytical skills. Other regions are prioritizing environmental preservation and restoration, economic and community revitalization, and quality of life improvements as part of a comprehensive approach to build advanced industry networks by creating a more attractive region to retain skilled workers and motivated entrepreneurs.

In every case, the appropriate set of economic strategies for a metropolitan region and the priorities among them can only be established directly by local leaders, and must be tailored to the unique requirements of the region's key industry networks. The following examples suggest how regions are designing and implementing metropolitan economic strategies to encourage the growth of globally competitive industry networks.

Transportation and Infrastructure

Infrastructure improvements involving state-of-the-art transportation technologies are central to industry network development strategies in many metropolitan regions. The Los Angeles region, with federal support, is building a high-speed rail and truck transportation route to move goods rapidly from the region's Pacific Ocean ports to railroad yards in the center of the city. This project – the Alameda Corridor – aims to build on Los Angeles's growing role as the hub for international trade to rapidly growing Pacific Rim economies. Metropolitan Atlanta is taking a different approach to develop itself as an emerging center of global commerce. By supporting private sector investments to upgrade the region's telecommunications capacity, building on existing regional strength in the manufacture of fiber optics networks, metropolitan Atlanta is generating a new approach to trade and transportation services by becoming a global center for transporting information and media. Other metropolitan regions, such as Jacksonville and St. Louis, are focusing on reusing military base facilities for new air transportation capacity. St. Louis is redeveloping

Scott Air Force Base into a new Mid-America Airport that will expand the region's air cargo and air passenger business.

Research and Technology

Metropolitan regions can expand their research and technology development to help build and strengthen industry networks. Several regions have had tremendous success using research and technology strategies in conjunction with business attraction and support for entrepreneurial ventures targeted to specific industry networks.

In the early 1980s, metropolitan Akron identified its synthetic rubber and polymer materials research capacity as a foundation for expanding into new advanced synthetics manufacturing. The region successfully built up its research base by expanding the existing Rubber Research Institute at the University of Akron into the College of Polymer Sciences and Engineering. Today, despite the long-term decline of metropolitan Akron's rubber tire manufacturing the Akron region is experiencing renewed economic dynamism based on the growth of manufacturing plastics and new synthetic polymers to serve as lighter and cheaper substitutes for a wide range of industrial materials.

Metropolitan Austin, one of the nation's fastest growing regions, developed its high-technology economy around the research base provided by the University of Texas. In the early 1980s, a public-private partnership designated $32 million to increase professorships so as to attract top national talent, and expand research in computers and engineering. The metropolitan region also worked hard to attract two major national semiconductor research consortiums to locate in Austin. In addition, to fostering technology commercialization, the Austin Technology Incubator was created to provide business assistance to spin-off firms from the region's university and corporate research labs. As a result, metropolitan Austin now has a large contingent of semiconductor, computer hardware and software design and manufacturing operations, successfully generating jobs and a prosperous new metropolitan economy.

Education and Workforce Development

Strategic investments in education and workforce development are becoming increasingly essential in making a transition to the New Economy, whether these investments are aimed at retraining workers displaced from declining industries, upgrading the skills of residents of disadvantaged communities to ensure their participation in the New Economy, or preparing young workers with advanced skills. Today, education and workforce development is almost always among the top priorities for every region's metropolitan economic strategy.

In metropolitan St. Louis, where the Aerospace and Defense industry network is rapidly downsizing, the region is pursuing strategies to reuse this network's highly trained workforce and technology assets to support growth in new, emerging industry networks, particularly in Electronics and Communications. In cooperation with local employers, both the St. Louis Regional Jobs Initiative and the Defense Adjustment Program are currently retraining and moving formerly displaced workers into jobs in new industries.

In the Detroit regions, where the decrease in automobile assembly jobs during the 1980s and the increase in economic isolation of inner city neighborhoods have reduced opportunities for low skilled and even moderately skilled workers, numerous job training and placement initiatives are underway. These programs have two goals: to train workers, particularly inner city residents, with advanced technical skills to supply the region's restructured automobile industry network; and to help attract businesses back to the central city. 'Focus: Hope' a large community development corporation in Detroit's inner city provides state-of-the-art technical and applied training that is not typically offered in high school or post-secondary vocational education programs. 'Focus: Hope' has successfully helped prepare thousands of young, urban workers for high-paying automobile industry-related jobs in Detroit and throughout the metropolitan region.

Financing

Availability of capital plays a critical role in a metropolitan region's ability to nurture start-up firms, develop small businesses, and help industries modernize. Metropolitan New York is particularly interested in encouraging the development of multimedia industries that bring together the region's strengths in entertainment, media, publishing art, and advertising. However, many small firms that make up the multimedia industry are often stymied by lack of capital for risky ventures, particularly in metropolitan New York's high-cost business environment. In response, new venture capital funds have been established in the region. The New York City Partnership and Flatiron Partners have each pledged $50 million to capitalize new venture funds. The Partnership's fund is targeted to promoting new business and job expansion in distressed neighborhoods. In the high-technology economy of metropolitan Austin, start-up firms play an important role in facilitating the transfer of innovations to the marketplace. The Austin region has begun strengthening its venture capital base through the Texas Capital Network, linking private venture capital firms and individual investors with appropriate start-up firms.

In other metropolitan regions, strengthening access to capital in impoverished areas is viewed as a key mechanism for stimulating business growth in the urban core. The recently established Los Angeles Community Development Bank will be the largest of its kind in the country and will provide $1 billion for business loans, loan guarantees, venture capital investments, capital grants, and technical assistance to small businesses in disadvantaged neighborhoods. In Detroit, an organization of corporate executives, Detroit Renaissance, launched the for-profit, $52 million Detroit Investment Fund in 1995 to target loans to businesses that relocate to the city.

Business Development and Attraction

Business development and attraction efforts have long been a central component of economic development programs. Typically these efforts include tax incentives, marketing campaigns, and technical assistance to small businesses. These efforts help bring new employers to an area, but they do not always focus on the quality and staying power of the new jobs created. Today, regions are rethinking their approaches to business development and attraction by targeting key growth industry networks. The industry

network approach helps direct scarce resources to build critical mass in existing and emerging industry strengths within the metropolitan region. Although particular programs continue to consist of tax incentives, marketing and public relations campaigns, trade missions and direct financial and technical assistance to local businesses, these efforts are now more often tightly coordinated with a metropolitan region's overall economic strategy.

The Austin and Nashville regions are two cases in which a highly targeted business development and attraction strategy was crucial to the emergence of an entirely new industry network. In metropolitan Austin's plan to focus on developing its electronics industry, an early and critical component was the attraction of two semiconductor research consortiums. The first, Microelectronics and Computer Technology Corporation (MCC), a private consortium, arrived in 1983. MCC helped make the region attractive to other computer and microelectronics researchers and manufacturers, including 3M, and Dell Computers, a local start-up company. A few years later, Austin attracted Sematech, a national semiconductor research consortium supported by private industry and the federal government. Building on these technology research assets and those of the University of Texas, the Austin region continued its aggressive efforts to attract semiconductor and computer research divisions, suppliers, and manufacturing firms. Today, the region has one of the most highly concentrated Electronics and Communications industry networks in the country, and has expanded into computer software development and telecommunications equipment manufacturing.

Trade Promotion and Market Development

The increasing globalization of business competition and rapidly shifting market demand means that business access to new markets, both foreign and domestic, is absolutely essential. Regional trade promotion and market development strategies can play an important role in helping metropolitan businesses combine their resources to gain access to new global markets.

In the St. Louis region, where the economy is still dominated by aerospace and defense and a range of consumer and industrial manufacturing industries, transitioning to new markets is essential. The metropolitan region is, therefore, working with aerospace and defense subcontractors to identify new uses and markets for their products. Metropolitan St. Louis also has established a World Trade Center to facilitate connections between foreign buyers and regional producers of agricultural, transportation, medical, and other products. For metropolitan Detroit, growing demand in China and other Asian countries for automotive and other transportation equipment presents important new business opportunities. Expanding international trade linkages and promoting the Detroit region's products abroad are, therefore, central elements of the metropolitan economic strategy.

Tax and Regulatory Policy

Burdensome taxes and regulations are often cited as an impediment to business competitiveness. Many metropolitan regions are moving to streamline their regulatory processes and ensure fair and efficient tax policy. In metropolitan New York, for example,

which has very high business start-up costs and high effective tax rates, officials are moving to lighten the tax burden on small businesses. This effort is part of the regional strategy to support multimedia, computer software, and other advanced technology industries that are dominated by small, specialized business operations. Several city agencies also are streamlining regulatory procedures by consolidating government inspections and application processes for business licenses and permits.

Environmental Preservation and Restoration

The quality of the environment is becoming an increasingly important factor in attracting businesses and workers to a metropolitan region. Industries used to be concerned about the physical environment mainly as a source of cheap and abundant natural resources like water, coal, or wood. Today, raw materials account for a smaller portion of business inputs, while the attraction of talented, skilled workers is a much greater need for many industries. Furthermore, extensive economic development has left many regions with limited open space and reduced ability to cope with environmental pollution. Many regions have, therefore, recognized that they cannot forgo environmental quality in pursuit of economic growth. Indeed, some regions are finding that environmental preservation and restoration is one of their main assets for generating and enhancing economic prosperity.

Metropolitan Los Angeles is one of the best known examples of the competitive disadvantages of environmental pollution and regional sprawl. In recent years, air pollution and traffic congestion have detracted from the region's attractive physical environment. Air pollution has become a deterrent in the Los Angeles region to the extent that some businesses have decided not to expand within the region, or even to leave. To address its environmental problems, metropolitan Los Angeles is pursuing several major transportation, regulation, and business development initiatives that are helping to generate new growth industries. The Los Angeles region is now creating business incubators and services to support the development of industry networks in the region, based on new technologies for reducing pollution and restoring the environment, including electric vehicles, intelligent vehicle highway systems, and materials recycling industries.

The Jacksonville region is already reaping the benefits of a metropolitan economic strategy focused on environmental restoration. Once suffering from severe air pollution generated by local paper mills and heavily dependent on employment from these mills, metropolitan Jacksonville's public and private leaders worked together, beginning in the 1980s, to invest in pollution control and cleanup. These investments helped revitalize the competitiveness of the paper industry. Moreover, environmental improvement helped make the region more attractive, directly enhancing efforts to build new industry networks, including Entertainment and Tourism, and Health Services.

Economic and Community Revitalization

One dramatic characteristic of the shift from the old to the New Economy across the nation has been a change in the functions and economic health of America's city centres. Particularly in older industrialized regions where the urban core once housed numerous large factories, the decline of manufacturing and the movement of businesses out of cities

undermined their economic vitality, especially in certain inner city neighborhoods. Income and racial disparities between cities and suburbs worsened in many regions. Nevertheless, America's cities have maintained certain key economic functions, such as fostering innovations, generating interactions in knowledge and creativity intensive businesses, and providing entertainment, sports and cultural amenities. These functions are vital to maintaining the global competitiveness and growth of industry networks that operate throughout the region. Consequently, metropolitan regions are increasingly recognizing that strong city centres are critical to the entire region's economic vitality. Public and private metropolitan civic leaders are undertaking economic and community revitalization strategies, not only to ensure that prosperity is shared by disadvantaged groups and neighborhoods within the region, but as a direct means of increasing the region's overall economic prosperity.

For economic and community revitalization strategies to be successful, they must link disadvantaged people and areas to opportunities in the New Economy. Metropolitan Detroit is doing this with the substantial support of the region's corporate and government sectors. Focusing on an inner-city area that has been designated as a federal Empowerment Zone, Detroit is providing tax incentives, training programs, and business financing to encourage new business development in the city's poorest neighborhoods. These efforts are particularly oriented toward attracting firms and supplying skilled workers for jobs in the region's rebounding Transportation Equipment, Industrial Machinery, and Industrial Supplies industry networks. Private sector employers, notably the major car and truck manufacturers headquartered in the region, are supporting these efforts with commitments to contract with inner-city, minority-owned auto parts supplier firms located in the Detroit Empowerment Zone and surrounding urban neighborhoods. Business and civic leaders also are making substantial new investments in rebuilding downtown Detroit. Most recently, General Motors decided to consolidate and relocate its world headquarters in the Renaissance Center in downtown Detroit. Additionally, the city is experiencing a revival of development in the downtown, including new baseball and football stadiums, an opera house and a theater. Finally, employers throughout metropolitan Detroit are investing in people living in the inner city who need suburban jobs by using job training and placement networks and non-profit community-based organizations such as 'Focus: Hope'.

Quality of Life

Another significant way that regions make investments to support their metropolitan economic strategy is to preserve and improve the quality of life for the region's residents. Quality of life concerns include affordable rental housing and home-ownership, community safety and security, health-care, public and private schools, and access to recreational and cultural activities. The quality of life that a region can offer is increasingly important in attracting and retaining thriving businesses and skilled workers.

Indeed, improving the quality of life is seen as one of the top economic development issues in the New York metropolitan region. New York's leading industry networks depend on attracting the world's "best and brightest" professionals to maintain high rates of innovation and global competitiveness. Yet, the region's quality of life challenges are

severe, including high housing costs, crime, and congestion. These problems hamper the ability of businesses to attract and retain talented personnel. In order to respond more effectively to quality of life problems, metropolitan New York is moving towards more neighborhood-level strategies for, amongst other things, reducing crime, improving public schools, expanding affordable homeownership and preserving open space.

Alternatively, other regions have used their "good quality of life" as a prime attraction for new residents and business. Metropolitan Portland's accessibility to a scenic natural landscape and the priority it has given to preserving a clean, attractive urban environment has set it apart from other regions in the competition for new and relocation businesses. Similarly, metropolitan Austin, Atlanta, Jacksonville and Nashville have benefited from having warm climates and reputations as attractive communities. Each of these regions has been making concerted efforts in recent years to improve its quality of life by developing cultural and recreational amenities. The Jacksonville region is a particularly noteworthy example of such a metropolitan economic strategy. Having made investments in new technologies at local paper mills to reduce air and water pollution and restore the region's environmental quality, metropolitan Jacksonville has now turned to developing an Entertainment and Tourism industry network in the region. Adding to the attraction of nearby ocean beaches, the city of Jacksonville recently acquired a National Football League team – the Jaguars – and built a new downtown stadium in addition to constructing major shopping and entertainment facilities along its historic downtown riverfront.

Conclusion

America's metropolitan regions are taking advantage of tremendous new opportunities for growth and prosperity offered by the New Economy. From the renewed automobile industry in Detroit and the synthetic polymer materials industry in Akron, to country music-related entertainment and media in Nashville and international trade services in Jacksonville, America's metropolitan regions are developing knowledge and information-based, technology and communications-intensive, globally oriented industry networks to lead the U.S. economy into the 21st century.

The economic transformation of America's metropolitan regions is occurring at different paces in each region and is due to technological and competitive forces beyond the control of any one set of business and civic leaders. However, public and private sector metropolitan leadership recognize that regions can shape their own destinies. Metropolitan regions are collaborating – through formal or informal mechanisms – to invest in resources that will improve the global competitiveness and job creation capacity of their key industry networks. By seeking to provide state-of-the-art-transportation and infrastructure, advanced technical business and job training, environmental cleanup, targeted business attraction, trade promotion, downtown redevelopment, and a range of other industry network needs, metropolitan regions are working together across cities and suburbs to build a more prosperous future for everyone.

Metropolitan regions cannot do it alone. Many of the most pressing needs of regional industry networks, such as transportation and infrastructure investment or public school

reform, require resources beyond the capacity of many metropolitan regions. By offering information and technical assistance as well as direct funding, state governments and the federal government must be key partners with metropolitan regions in targeting investments, incentives, and regulatory changes to support the priorities of their metropolitan economic strategy. Working together in a new nationwide, public-private partnership, America's metropolitan regions, states and the federal government can generate a stronger national economy and greater economic prosperity and quality of life for every family and community in the 21st century.

CHAPTER 3

A US-EU Regional Partnership – Northeast Ohio and Southwest Saxony, Germany

Stephen Kidder and Graham Attwell

Close linkages between Regions in the United States and Europe

There is a long history underlying the linkages between different regions in the United States and Europe going back to the early years of the existence of the United States of America and even predating its foundation. In the framework of to-day's global society and economy it cannot be considered purely accidental that new trading and cultural links are being recreated between regions of the US and the EU which have had close relationships in the past. During the last nine years, civic leaders, entrepreneurs and development agencies in Northeast Ohio and Southwest Saxony have been rebuilding historic links between their areas. Over the past two centuries Northeast Ohio became the home to one and a half million people of German origin – by far the biggest cultural grouping living in the area – many of them from what was known for the past fifty years as Eastern Germany.

That these two areas which have been linked together so closely in the past and have shared similar types of economic, industrial, social (and in the case of Saxony), major political traumas, are now again co-operating and learning from each other, is a sign of the enduring links between the United States and Europe, and it is appropriate that the City of Akron in Northeast Ohio became the location for hosting a major event in February 1998 – the Akron Forum – to discuss regional co-operation between the US and the EU.

This chapter will examine the historical, economic and social background to the links between these regions and will describe how the relationship has been re-enacted in the recent period. It will examine the development of new regional development organisations and consider how US-EU co-operation can benefit the development of the economies in both continents.

Economic and Social Development in Ohio

Located in the heart of the nation's industrial region, Ohio is strategically situated on the great inland waterways and criss-crossed by the interstate roadway system. Sixty percent of all U.S. households lie within 600 miles of Ohio, and more than 50 percent of the Canadian market is within the same range. Seventh in the nation in total population, Ohio's population of 11,172,782 people is concentrated in eight large urban centres and 15 micro-metropolitan centres. The largest metropolitan area in Ohio is the Cleveland-Akron consolidated area with 2,913,000 people. Other metropolitan areas with populations in excess of 500,000 include Cincinnati, Columbus, Dayton, Toledo, and Youngstown.

Ohio's economy grew rapidly in the first half of the twentieth century based on engineering and manufacturing industries. It became the centre of the American motor car and machine tool industries and the world's leading manufacturer of car tyres. As the economy grew so did the demand for skilled labour. Many of the workers who moved to Ohio came from middle Europe and from Germany, with waves of immigration following the first and second world wars.

In the 1970s the area experienced a severe recession. Heightened international competition, lack of investment in infrastructure and changing technologies led to the collapse of its industrial base and it became the site of one of the 'rustbelt industries'. In particular the rubber and tyre industry, of which Akron was the centre, experienced a dramatic collapse. 20,000 people lost their jobs in a period of three years. In Akron 60,000 out of a total workforce of 300,000 were unemployed.

Over the past twenty years the economy has been rebuilt and in the last five years has once more experienced a boom. Ohio's economy created 128,000 new jobs from October 1996 to October 1997. As of October 1997, Ohio's unemployment rate, seasonally adjusted, was 4.5 per cent, compared to a 4.7 per cent rate for the U.S. Ohio's gross state product was approximately $309 billion in 1996, making Ohio the seventh largest state economy. If Ohio were a nation, its economic output would rank 18th in the world.

Ohio's manufacturing sector employs 1.1 million people, making Ohio the second largest manufacturing state in the nation. The state's factories lead the nation in the manufacture of steel, plastics, rubber and fabricated metals. Ohio also is a leading producer of autos and trucks.

However the boom has led to severe skill shortages, especially for computer and machine technicians. Young people have increasingly turned their backs on traditional skilled craft trades, preferring instead to follow college education in pursuit of white-collar careers. Apprenticeship programmes have traditionally been weak, with employers preferring to follow a high technology strategy rather than depending on skilled workers. Following changes in the US immigration law in 1962, the wave of immigration of skilled workers from Europe, the traditional response to skill shortages, dried up.

It is this background, which has provided the impetus to rekindling the traditional links with Germany.

Economic and Social Development in Saxony

Southern Saxony is one of the oldest industrial regions in Germany. Together with the Rhine Valley, it was the heartland of the industrial revolution in the last century, and was the centre of the mechanical engineering, tool making and automobile industries up to the second world war.

The capital of the region is Chemnitz, formerly Karl Marx Stadt, with a population of 265,000. The region is situated in South East Germany in the Erz mountains, with close access to the growing markets of the Czech Republic and eastern Europe.

Following the Second World War the economy of the region continued to grow based on the engineering and car industries. But the re-unification of Germany was to lead to a

major economic collapse. An outdated infrastructure, restrictions in trade, lack of investment in modern technology, over-manning compared to western industries and the introduction of the one-to-one exchange rate between the former Eastern and Western German marks, led to the closure of much of the industry. Saxony also suffered in that, as in Ohio, industrial growth had been based on heavy industries, which were undergoing rapid technological change and the region was also prone to competition from the newly emergent economies in the east.

Since re-unification the economy has slowly been rebuilt although unemployment, in common with other states of eastern Germany, remains high. Engineering remains an important industry and today Chemnitz is well on its way to becoming an important location for high-technology in Germany. The area has a considerable advantage in the skills of its workforce, especially in craft trades, and the University of Technology has proved a driving force behind the development of the city of Chemnitz. In recent years, dozens of hi-tech firms have been established in and around the city, many of them founded by graduates of Chemnitz University of Technology. In addition to this, important enterprises such as Volkswagen and Siemens have also chosen to move into the area. Nevertheless there remains some progress to be made in developing an indigenous innovation culture and providing sufficient economic growth to generate new employment opportunities, both to deal with existing unemployment and provide real opportunities for young people to live and work in the area.

Northeast Ohio Trade and Economic Consortium

The inspiration for reviving the links between Saxony and Ohio came from the Northeast Ohio Trade and Economic Consortium (NEOTEC). NEOTEC was formed in 1996 and was inspired by Tim Davis, Executive for Summit County, and the collective leadership of five other Northeast Ohio counties that participated in its creation (Columbiana, Mahoning, Portage, Stark and Trumbull). There are 19 counties in Northeast Ohio which may someday be a part of NEOTEC. Such a union of economic potential (50 per cent of Ohio's industrial production) would further enhance the region's appeal to world traders and business.

Even before NEOTEC's inception, its leadership envisioned a partnership with a kindred region in Europe. History and culture led them to Southwest Saxony, the area including and surrounding Chemnitz. Not only was there a strong tradition of German immigration to Ohio but both regions have strong ties to the automobile and machine tool industries.

In the 1970's, the NEOTEC region was devastated by the dissipation of the tyre industry which it had spawned some hundred years earlier. What Southwest Saxony experienced in the 1990's as a result of its amalgamation into the Federal Republic of Germany had already been weathered by NEOTEC's region. Years of re-evaluation and redirection, combined with a will to prevail, contributed to making the NEOTEC area one of the most productive and industrially prolific in the USA. From tyres there came polymers and plastics. The know-how to use machinery to make products from the new manufacturing manna was already in place and at that time (late 1970's & 1980's) perhaps adequate. Today, hundreds of companies feed the automobile and other industries with components

made by experienced manufacturers on machines evolved from the experience of their forbearers.

A similar evolutionary manufacturing metamorphosis is taking place in Greater Chemnitz area. Already its reputation as a centre for automobile production has been re-established. The partnership between the region and Ohio is seen as contributing to the regeneration of its economy.

Developing Exchange Programmes

NEOTEC and Chemnitz, through the latter's economic development organisation CWE, led by Dr. Bernd Lange, perceived a symbiosis for both partners: unemployed Saxonian skilled workers might answer the NEOTEC manufacturers' immediate needs for skilled machining specialists. The workers would be processed through a form of training at a local facility such as the Akron Machining Institute (AMI) or Portage Lakes Career Center. They would be exposed to commercial English and American entrepreneurial methods. The skills and knowledge learnt from the exchange programme would benefit individual employees, American companies interested in doing business in Germany and local businesses in Chemnitz.

This possibility was first discussed in late 1996 when NEOTEC leaders visited the Siemens and Volkswagen training facilities in Chemnitz. Further enthusiasm for an exchange followed a meeting in Chemnitz in April 1997, with the local Arbeitsamt (labour office). The sophisticated universal service offered to young (and also not so young people) was noted during that visit and led to the consideration of the future development of a project to exchange young workers.

It is worth noting that young people are not encouraged to pursue the machining trades in the United States. Some statistics suggest a bleak prospect for careers in these fields. It appears that the data upon which such as prognosis was made was based upon inputs by large companies and not the small and medium sized ventures which are in great need of skilled workers (at least 500, some say, in NEOTEC's sphere of influence). NEOTEC is set on averting an unnecessary gap in trained capacity by giving a common sense regard to working models flourishing in Saxony.

NEOTEC and Chemnitz leaders projected a positive influence on young American people while a dozen or so self-confident and motivated skilled German craftsmen took up the challenge. The experiences of Austin (Texas) and Koblenz (Germany) in training American youth in auto-repair disciplines is supportive. All of the participants found good jobs on return to the US. Americans were taught well in Germany and their employers valued the quality of the work they produced. Although there is still some opposition from American Labour Unions, the active role of German unions like IG Metall in the training process of skilled workers could be used to demonstrate benefits to their American counterparts.

Getting people into the US to participate was not perceived as a problem. The United States Information Agency (USIA) would assist with exchange programmes, as would the Carl Duisberg Society in Cologne, Germany in arranging visas. At present, more than 15 NEOTEC companies have asked to participate in the original concept of taking on skilled

workers for a period of 'on-the-job' experience and class-room training. Added to the players is the Chemnitz office of the IHK (Industry and Trade Chamber of Commerce) which is identifying new journeymen to be interns (Praktikanten) for at least six months in NEOTEC workshops.

Building Regional Partnerships

The initial success of NEOTEC has led to plans for its expansion. It is intended to develop a new strategic partnership in the region, encompassing the Ohio Department of Development and Kent State University, along with NEOTEC itself. The School of Technology at Kent State University has a campus in every one of the eight regions of North West Ohio encompassing a geographical area of 160 miles in radius. Besides offering education to degree level, the School of Technology has developed a mission to support the development of applied research and for workplace development in the region.

The plan for workplace development has been developed in conjunction with NEOTEC. It includes the provision of training for industry and partnership in research as well as the provision of business and technology incubator units for the development of new enterprises.

The School of Technology is also supporting the extension of the exchange programme with Germany through providing distance learning programmes. These programmes are providing support for machinists to work in Germany for up to six months. Whilst some are drawn from existing enterprises, the programme is also providing opportunities for the unemployed. The exchange programme is considered as valuable, in that Germany has advanced expertise in the education and training of machinists, whilst there is a shortage of industrial machinists, especially of tool makers and CNC operators, in Ohio.

The longer-term aim is to overcome the 'training gap' which is leading to skills shortages in Ohio. In partnership with NEOTEC, the School of Technology is developing regional centres of excellence at each of its campuses. These include specialist support for logistics and for small machine shops. At the same time the School is looking at the problems of recruitment linked to the relatively low esteem and prestige attached to technical occupations, compared with white-collar professions. They recognise the need for a campaign to promote alternatives to college education.

Regional Partnerships: a strategy for the future

The Professor and Dean of the School of Technology at Kent State University, Dr. Raj Chowdhury sees the developments in Northeast Ohio as crucial to future national and regional economic development in the US:

"The United Sates is a rich country. However, no one realised the implications of a passive approach to infrastructure and industrial renewal. There was no consideration paid to the need for a policy response to innovation. Northeast Ohio was allowed to become a 'rustbelt'. With the collapse of the tyre industry 20,000 people lost their jobs over a period of three years. 60,000 out of a total workforce of 300,000 were unemployed. At that time,

Kent State University was a traditional institution aimed at providing general education for college graduates. Now it is changing. It is impossible to separate government, economic development and higher education. We have to move away from viewing unemployment as a social phenomenon to realising that it is linked to business and economic development."

It is this philosophy which underpins the developing strategic approach in Northeast Ohio. There is a recognition of the need for local government to act internationally to promote regional economic development. However, this concept is new to many in the US and there is still a limited understanding of such an approach. The development of the concept of learning regions and the need for networks is limited by the artificial boundaries of local government. Whilst natural economic regions can be defined by the work-force and economies, government boundaries tend to adhere to geographical features or spatial areas. A further barrier to regional economic development is the predisposition of capital investors to view development in terms of 'physical capital' and play down the importance of 'human capital'.

However, learning from their European partners in Saxony, many of the leading actors in Northeast Ohio clearly understand the importance of investing in people, and to prove that, the infrastructures involving public education bodies, such as development agencies and universities working with companies, are being put in place.

CHAPTER 4

Stimulating Regional Innovativeness: The Learning Region

Thomas Stahl

Encouraging regional and local initiatives as a European strategy to deal with the challenge of industrial change

The notion of local networking as a strategy for employment, competitiveness and growth is to be found in the statements of the European Commission and the Member States of the EU in relation to the challenge of industrial change.

In explicitly stressing the employment strategies of local networks, a new role is seen for "territorial employment pacts" (European Commission, 1997). The critical review of local development experiments conducted in the 1990s stressed that they contribute to economic and social cohesion, to greater efficiency in Community financing and to a reduction in the democratic deficit. The following focal points indicate the strong points of local development strategies in dealing with industrial change:

- Local development promotes the establishment of public-private partnerships and thus mobilizes new actors and financial resources for development projects. This is vital given the problems of "Welfare State" systems in the face of public sector deficits. Far from promoting the "omnipresent State", local development promotes a new kind of energizing role for public authorities. Bottom-up development is encouraged, a process which also calls for the development of effective partnerships and cooperation between the different administrative government departments.
- The application of the principle of subsidiarity presupposes the existence of local initiatives involving all the economic, social and cultural actors – enterprises, trade unions and associations. Local development in this way constitutes a foundation and a driving force for the principle of subsidiarity and facilitates the decentralization of government actions.
- Local development ensures greater efficiency in the use of public finance through better management of local projects. The contribution being made by intangible investments and human resources to economic development means the growing importance of the "organizational" and "social" components of local development.
- Local development is also directed towards the more equitable redistribution of wealth. Indeed, in view of its socio-economic aims, it seeks to meet the needs of the various social categories and, through its local spatial dimension, is capable of embracing all parts of a territory. Local development, therefore, can be seen as a method to address imbalances.

This paper addresses new regional development approaches with regard to the following:

- To deal with the challenge of industrial change, individuals, enterprises and governments need an in-built capacity to innovate in their actions, processes and structures.
- To establish this innovativeness systematically, new types of interfaces have to be installed at all levels of our societies, involving different reference systems in co-producing new solutions.
- The learning region concept promotes a multitude of open interfaces resulting from local networking and partnerships.
- The example of SME networking on a regional basis in relation to HRD (Human Resource Development) demonstrates the emerging innovativeness of learning regions.

Structural and Individual Innovativeness to deal with Global Challenges

The challenge of industrial change has been addressed so often in recent years, that it is not necessary to discuss it again:

- global markets;
- customer oriented markets;
- new technologies;
- unemployment; and
- value shifts.

In all discussions about meeting the challenge of industrial change, whether this is seen as threatening or as an opportunity for our societies, "challenging factors" are seen as external forces, disturbing our structures. Europe, its economy, its systems of social security, are seen as being attacked by external forces. This perspective of external challenges, confronting positions within stable boundaries is a widespread one, characteristic of many organisations. At the level of the enterprise, *market research* is a traditional example of a strategy in which customers are seen as external challenges. Taylor's *scientific management* theory likewise saw the alien world of operative workers as an "external" challenge within the enterprise. However, even within these traditional externalised confrontations between different reference systems, innovations have occurred. Market research resulted in new product ideas and Taylorism resulted in rather effective production systems, based on specialization and top-down control.

To establish a *culture of innovativeness,* however, a strategy in which interfaces are primarily understood as rigid boundaries between reference systems, will never be successful.

Contacts mediated by such boundaries and rigid control systems tend to be:

- one-dimensional;
- unilateral;
- predefined;
- limited in their impact.

As a consequence, innovating forces resulting from these interfaces are episodic and rather limited. These interfaces are functionally predefined and are characterized by formal and informal norms and rules. They gain their rationality from predefined, smoothly functioning processes within hierarchical structures. Administrative processes regulated by law, or classical top-down management in neo-Fordist enterprises, function by way of these interfaces, as seen, for example, in the interfaces between different managerial levels and departments within a company and also between different companies. The objective of these types of interfaces is to stabilize given ways of co-operation and communication, to promote total clarity in functions and to avoid unplanned or spontaneous innovations. Innovation in those systems is seen as the exclusive function of specific departments or functions and innovation emerging elsewhere in the system is seen as a threatening disturbance to pre-planned processes.

In the example of neo-Fordist management-worker relations the interface (defined in terms of strict descriptions of working-tasks and informal rules) reduces contacts to that of management controlling actions and to obedience by the workers. Both sides do not leave their tightly closed positions in line with pre-planned processes. Workers are not expected to invent optimizing ideas. Their own reference system would not encourage that. But even if they did present their ideas to managers, they in turn would feel their position threatened and would be likely block them.

However, enterprise culture has changed dramatically since the 1980s although it must be said that this is not an ideological change under the guise of the introduction of new "democratic" enterprise modernisation patterns, but rather a restructuring to meet external challenges. All examples of innovativeness (e.g. new work organisation, partnerships and networks) show one common feature – *it is the productive interaction between different reference systems (management and employees, enterprises and other enterprises, different traditions of thinking) that promotes innovativeness.* In other words, to foster innovativeness in structures, we have to open up boundaries and allow different and even contradictory reference systems to co-produce jointly agreed solutions. Implementing systematic innovativeness in our economic and social culture has to exploit the potential benefits resulting from the confrontations between different reference systems. This is achieved through opening up interfaces between these systems making them:

- Multi-dimensional;
- Multi-lateral;
- non-directive; and
- open to the possibility of unpredictable consequences.

Of course, this new concept of promoting innovativeness, through inviting different, and sometimes contradictory interests, to change their orientations, is obviously threatening to traditional structures. Positions and roles change, authority becomes shaky and the notion of hierarchy itself is called into question.

Networks and Interfaces for Innovativeness

Horizontal networking, inside and between organisations, is one of the terms used to describe the new kind of co-operation between hierarchical control systems which go beyond the neo-liberal ideologies of competition, seen by many people as the only way to conduct relations in today's market-economy. Horizontal networks, which tend to follow rather abstract definitions, take the form of a whole range of different co-operative relations. The informal ways in which autonomous work-groups, within an enterprise, operate may be called horizontal networking, as well as the more formal contracted (regulated) ways in which an enterprise interacts with its subcontractors, or the manner in which a partnership of SMEs co-operates with regard to HRD and training, without entering into any contractual arrangements.

Characteristic of all of these different ways of organisational networking is the co-operation of the actors. This is based on common interests, multilateral trust, direct self-regulated control and evaluation of results and a high degree of flexibility with regard to network-relations. The manner of working within the network, its effectiveness and efficiency, is constantly assessed by all partners. Partners can join, leave and rejoin without any formal restrictions. Of course, the different networks have to deal with their own problems and difficulties. Horizontal networks inside enterprises, for example, have to find a way of facilitating the different groups along the lines of interconnected enterprise tasks (Warnecke, 1975). Networks of SMEs in the training field also have to overcome competition and mistrust to find common ways of undertaking HRD.[8] In a framework of government-led deregulation policies all over Europe, emphasis is being laid on public-private-partnerships, organised along horizontal networking lines. Although this model has enormous potential in terms of flexibility and innovativeness, classic public-service bureaucracies have great problems in developing non-directive and open relationships towards private organisations (Schmidt, 1993).

All of these new networking activities inside and between organisations provide fertile ground for the establishment of systematic interfaces for innovation. It is the openness of these networks in relation to the interests and needs of the different partners, along with the absence of fixed preconditions or rules that gives rise to new relations, new ways of co-production and new products or services. The form which the different networks take can be summarised as follows:

- networks comprising reference-systems with *similar backgrounds* (e.g. SME networks, sectoral or training provider networks);
- networks comprising reference-systems with *different backgrounds* (e.g. private-public partnerships, university-enterprise partnerships);
- *mixed networks*, comprising similar and different references (e.g. SME networks comprising industrial services or sectoral enterprise-networks comprising research institutions).

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[8] One can see this in the project „SME NET" in Linz, Austria, the project „Lernende Region" in Chemnitz, Germany, or the project „Lernende Region in Graz", Austria. In all of these cases it took time and marketing activities to convince local SMEs to co-operate.

The network pattern of what is termed the "Learning Region" approach allows for the highest degree of multilateral openness and a mixture of partnerships, because it attempts to address all interests and problems related to a local or territorial reference system (Granovetter, 1985). This approach seems to be promising in terms of maximizing the quantity and optimising the quality of innovation promotion interfaces.

Building Interfaces to Co-produce Innovative Solutions in the Economy and Promote Employment: The Learning Region

The Learning Region concept is based on the systematic use of complementary interests, competencies and infrastructures to exploit a bottom-up development of enterprises, institutions and administrations by way of partnerships and networks (Stahl, 1996). While not denying the rationalizing effects resulting from these types of partnerships, this section will mainly focus on the innovative effects of local and regional networks.

Different Starting Points, Similar Structures, Common Objectives

In analysing pilot projects and other experiences in local networking, it is obvious that there is variety in the needs, interests and backgrounds of local actors. In this regard, we find networks of socially motivated initiatives attempting to create "artificial" jobs for the long-term unemployed. We find networks of enterprises to carry out common activities (e.g. marketing, quality control, training). We find networks of farmers and associated agricultural production bodies aiming to improve marketing or share machinery or even promote alternative (green) farming. These are just some examples of local networking initiatives. Looking in more detail at these different approaches, it becomes clear, that the initial activity is generated by different actors. It may be an active farmer, committed to "green" farming who initiates a network of other farmers and customers to produce and market food without chemicals. It may be a training provider creating a network of SMEs to deliver HRD more effectively and efficiently. It may be a local labour-market service inviting local entrepreneurs to create job opportunities for the unemployed. In all of these different local networking arrangements there are similarities in structures and processes that are characteristic of the Learning Region model. These are as follows:

Bottom-up approach

Initial actions are taken by actors who want to improve their own activities by way of cooperation and networks. Governmental policies are not defining the direction, structure and process of this intervention, but it results from steps taken and processes constructed by the participating actors themselves.

Partnership and networking

Co-production of common solutions is organised by way of partnership arrangements transcending competition and bureaucratic control mechanisms. Multilateral trust, solidarity and direct personal involvement and control are the main mechanisms of network-organisations. If contractual solutions are involved, regulations are generally simple and easy to change.

Local focus

Underlying networking and partnership arrangements is the principle of a common local basis for the activities. Actors know each other, share a common environment, understand the local context, are living and working in close proximity and are confronted daily with common problems. While locality may appear to be a rather weak tie for diverging interests, its neutral character provides a basis for cooperation and networking within and between different reference/ interest groups.

Flexibility

As network construction is based on the day – to – day needs of the actors, structures and processes can change as the needs and interests change. Even the existence of networks depends on the actors' perception of needs.

A common effect emerges as a result of the Learning Region approach in many regions, namely: *the reduction of social segmentation at the local or territorial level.* In this sense a communitarian philosophy may be reinforced by the Learning Region approach.

Keeping in mind the theory and principles outlined above, the remainder of this paper illustrates the development of a learning region in the context of *SME networks and employment initiatives.*

Local Development and Employment

There is clear evidence that SMEs are responsible for the main growth in employment at the end of the 20th century. That is why assistance to SMEs is crucial for the improvement of regional employment.

Regional Development and SMEs

SMEs form the backbone of economic life in most European regions. They provide employment as well as supply products and services. The taxes which are paid support government actions. Even in regions dominated by large enterprises, SMEs play a key role, being suppliers or subcontractors or operating in the retail sector. However, because of their limited capacity to modernise, they have a need for specific external services to help them deal with economic and technological challenges. In the field of *technological consultancy*, this need has been addressed in different regions in Europe through the foundation of centres for technological information and consultancy (e.g. "Technopoli"). The usefulness of this approach cannot be doubted but the following weak points still need to be noted:

Information and consultancy on technology is very often "technology-centred", which means it does not cover the problems of the application of technology. It is necessary to provide the SMEs with practical advice in relation to the implementation of technological solutions.

The technological information and consultancy needs to be provided geographically very close to the SMEs.

Many centres for technological information and consultancy do not have a holistic approach to enterprise problems. An effective application of modern technology in SMEs of necessity also requires measures to reorganize work and to provide adequate training for employees.

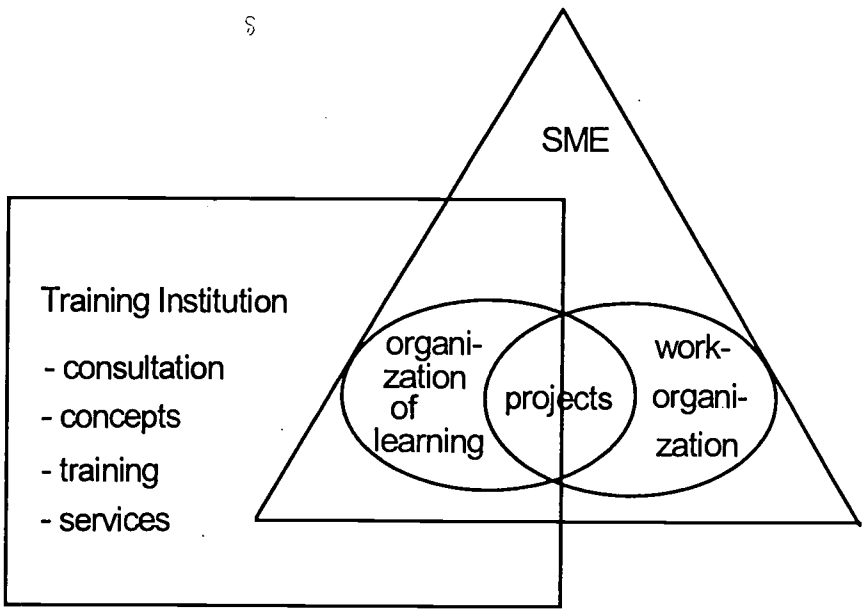
The situation of SME development is, in particular, highly problematic in the fields of *organizational development and human resource-development*. In general, although there may be a sufficient capacity for vocational training on a regional level to supply training for the different professions, training offers are not designed to meet the specific needs of SMEs in relation to the content of training, the methods of training and the organization of training. This is caused by the following.

Modern enterprises demand learning as an integrated activity within the enterprise. This means that external training institutions have to act in a customer-oriented way to foster these activities.

There is a lot of confusion in SMEs concerning the role of HRD in management policy. External training institutions have to respond to this – requiring, on their part, a competency in providing consultancy.

There are also some material restrictions in SMEs in relation to HRD – most being financial and organizational. It is never easy for enterprises to send their staff to external, long-term seminars. Training institutions have to deal with this problem creatively.

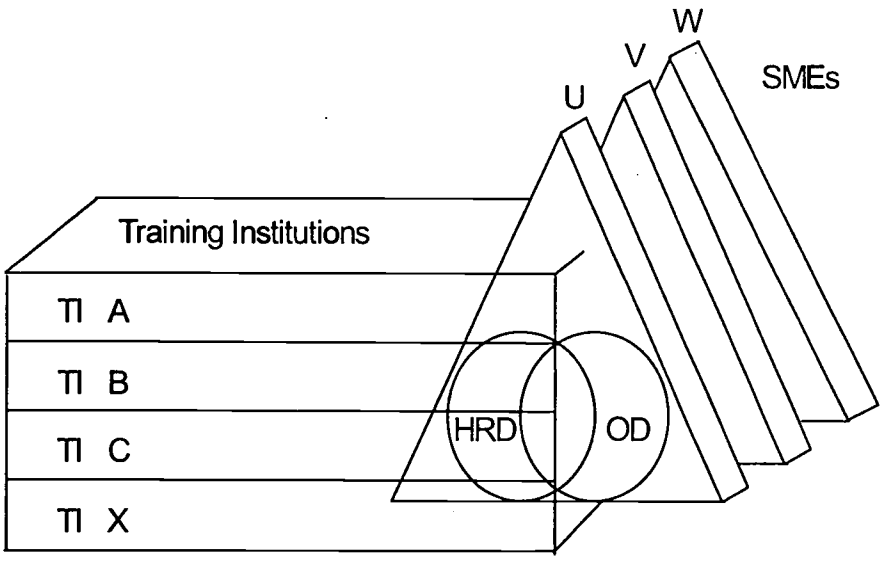
Close co-operation between training institutions and small firms is needed to deal with the above problems, which entails integrating the activities of external training institutions with the enterprises.



The interrelationship between the organization of learning and the organization of work entails cooperation between the training-institution and the enterprise. The "learning-organization" concept can be enlarged in this respect going beyond the restructuring within an enterprise, to embrace the broader notion of cooperation between a training

institution and an enterprise. The entity created through this systematic cooperation is another kind of "learning-organization" (Stahl et al., 1993). In terms of innovation theory, this kind of co-operation takes the form of an open interface, *co-producing innovations* in two spheres. The "world of work" is changing as a result of learning challenges and "learning" itself is also paradigmatically changed through its close connections with activities on the shop floor. The two reference systems "learning" and "working" are confronted through the interaction between the training institutions and the SME.

A Training Consortium is the result of this cooperation between a number of training providers and SMEs.



In building cooperation according to the ideas outlined above, it can be seen that two new types of interfaces are occuring. Firstly, training institutions and SMEs are complementing the learning/working interface and secondly new interfaces with other services come about. Other local service structures for SMEs (consultancy in marketing, organizational development and financing), facing similar challenges have a framework to overcome their problems. Here also, holistic thinking is lacking and tailor-made solutions are often too expensive. A solution to this entails that programmes for SME development must a) integrate the different infrastructural services, and b) be problem-oriented through focusing on the "interdisciplinary" challenges faced by SMEs.

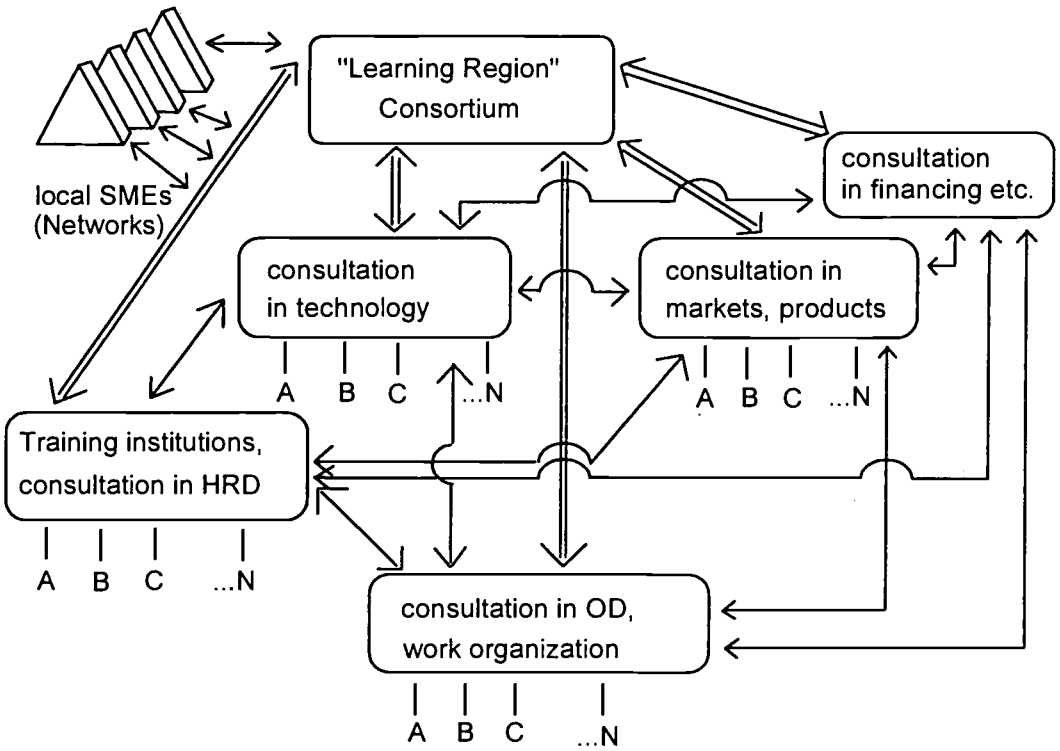
This new kind of regional co-operation has parallels with the developments taking place in large enterprises, namely: *the planning and establishment of innovations in an integrated way through parallel OD, HRD and technology applications.* In addition to the above mentioned infrastructural assistance for SMEs, regional consortia must also develop and foster *programmes for young entrepreneurs to stimulate enterprise-creation*. This includes not only the cooperation of training institutions, technology, marketing and organizational consultants, but also the provision of financial consultancy by regional banks and information concerning public funding.

In Conclusion

Local development lies at the heart of the strategy to boost entrepreneurship and to activate human potential. The advantage of local networking activities for enterprises (especially for SMEs) lies in *the mutual exchange of experience.* The constraints of size, faced by SMEs, can be overcome by means of partnerships that *achieve economics of scale* through common training, marketing and consultancy. The main advantage, however, lies in the emergence of an innovative culture of local enterprise development that can result in "snow ball effects" on economic development and employment. For these local development initiatives to have a lasting impact, however, it is important to take *a long-term view* and situate them in an overall regional integrated framework.

In summary, local networking between enterprises can be seen as resting on three pillars:

- complementarity between different local economic interests;
- support and guidelines provided by national an EU development programmes and
- the promotion of social values and norms based on long-term scenarios, local control and personal trust and confidence.



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CHAPTER 5

Partnership and Networks: a Dynamic Approach to Learning in Regions

Ludger Deitmer and Graham Attwell

In the age of globalisation the competitiveness of European industry depends to a great extent on its ability to maintain technological advantages so that new or improved product innovations can be brought to the market rapidly and at decreasing costs (European Commission 1995, 1996). Over the past few years a new paradigm has been identified, variously referred to as the *network or the partnership paradigm*. Inherent to this is a strong belief that markets, global hierarchies and state control do not successfully mobilise the necessary resources for innovation and economic development in different regions. Interactive innovation capacity and social capital are fundamental resources for future economic development and the generation of new employment (Camagni, 1991; Porter, 1992; Lundvall, 1992; Cooke and Morgan, 1993; Rauner, 1995; Storper 1995, Endres & Wehner, 1996; Manske, 1997).

Learning to innovate is in this respect an important prerequisite in responding to this challenge. The importance of knowledge acquisition and development as key factors for the future competitiveness of Europe requires a better understanding of the "sources of learning". The aim of this paper is to explore the processes involved in the development of knowledge within regions. It is our thesis that learning and knowledge production are social activities and are situated in technological, organisational and communitarian forms and processes bounded by spatial relationships. Regional learning strategies are based on neighbourhood and co-operation and therefore are interactive and cross-institutional.

The paper will focus on the nature and role of different types of regional partnerships and networks in the creation of new learning and knowledge for product and process innovation. We will examine the involvement of different actors in the creation and promotion of partnerships and regional networks. We will end with guidelines and principles for management in the building and coaching of networks.

Learning processes in a regional context

The **first aspect** to be discussed is the **nature of learning processes in a regional context**. Much of the research on HRD and work-based education and training, informed by a rationalist perspective derived from human capital theory (Becker, 1964, cited in Ellström, 1997), does not readily lend itself to the study of learning processes within firms and their role in the promotion of social innovation. Ellström points out that "innovation is viewed primarily as the result of exogenous technological progress and investments in research and development, rather than as the result of learning processes and pro-active behaviour by individual or collective actors at the level of the firm" (Nelson, 1993; Nelson and Winter, 1982; Hommen, 1996). At the same time approaches to learning have relied

mainly on theories of learning which emphasise its abstract mental process and de-emphasise its social, relational and situated basis (Guile and Young, forthcoming). Researchers from both human resource development and from innovation theory have both failed to make the critical link between situated learning and social innovation. By treating innovation as a technologically determined process and by treating learning as a largely technical and individual matter, learning is rarely seen as integral to the process of innovation, and new forms of knowledge production become abstracted from social forms of interaction and practice within the workplace and broader community. As Guile and Young (1996) have cogently argued: "the problem with individualist conceptualisations of learning is that they neglect the extent to which learning is first and foremost a human activity and therefore, about social relationships and people participating in different types of community".

Learning is a *social process in which individual and institutional actors collaborate and interact on specific subjects and themes*. Knowledge is acquired, developed and applied through the interpretation of experience, based on idiosyncratic frameworks and networks that at the same time favour and limit the individual process of sense making (Resnick, 1991). Knowledge networks are underpinned by complex social relationships and the production of new knowledge is increasingly dependent upon access to such knowledge networks as well as opportunities to participate actively within them (Lundvall and Johnson, 1994). Knowledge networks, bound by professional and spatial dimensions, are critical to the process of the transformation of tacit knowledge to practice and innovation. Innovation springs from the continuous and dynamic interaction between implicit and explicit knowledge (Nonaka and Takeuchi, 1995).

Regions provide a spatial context for networks and partnerships to develop new learning strategies for knowledge production and innovation. Within a region, partnerships and networks are dependent on the interaction between the different actors who form communities of practice. Whilst these networks are based on the direct relationships between participants they are also dependent in part on the influence and mediation of facilitators and intermediaries. The facilitation of learning and the generation of new knowledge leading to innovation in networks is based on the availability of both human and physical resources.

The description of a network or partnership is therefore more than a description of the flows of information and the differential availability of this information. It is an expression of the knowledge that influences the capability and competence of individual actors, as information leads to new social relations. A basic assumption in this context is that knowledge consists not only of information. Know-how is the knowledge of how the capabilities of individual institutions within a region might be harnessed through co-operation (Morgan, Nauwelaers, 1998).

Therefore knowledge is the effective exchange of qualified information and presupposes communication or direct face-to-face contact between individuals. In this respect spatial proximity is of prime importance. The globalisation of information and production results in contradictory phenomena. On the one hand, we see the emergence of dispersed communities of practice on an international and global scale, facilitated by information and communication technologies (Guile and Young, forthcoming). On the other hand, new

production concepts such as flexible specialisation are leading to a rapid growth in regionally based small and medium enterprises. At the same time a decreasing percentage of workers are involved in production for export, through greatly increased productivity in traditional export industries and the growth of service industries (Crouch, 1996). Both these changes are reinforcing the importance of regions as spatial areas of activity. The development of SMEs and service industries are embedded in regional economies.

Networks within regions take different forms. The first is *information networks*. They provide information on the potential of different regional actors. This kind of exchange can lead to partnerships and later on to networks.

The next developmental stage, are *knowledge networks*, which form the basis for developing innovation networks. Knowledge networks are directed by learning strategies which develop knowledge and experience.

Innovation networks revolve around the development of new technical solutions, new equipment and knowledge in contact-intensive interactions. In other words innovation networks originate from the creative combination of know-how through knowledge networks and specific skills and potential represented by the regional stakeholders, clients and providers (Maillat, 1994, Huggins 1997).

The different forms of networks are characterised by different degrees of integration with varying autonomy for actors within a region, seeking the development of new or transformed knowledge. Innovation networks are by their very purpose the most interactive and complex and are correspondingly the most difficult to implement within a region. (Attwell et.al., 1997)

The global economy may be **conceived as a mosaic of regional production systems**, "each with its own intra-regional markets and activities, and as a global web of inter-regional linkages" (Huggins, 1997). This leads to the idea of **'global regions'**, generating a paradox in that the **'network economy'** must be developed both at the local and at the global level. It stresses the dynamic interaction between the local environment and the global economy (Lopriore 1997). Knowledge networks are increasingly recognised as key instruments in regional learning and development strategies. The presence of regional knowledge networks is being recognised as a factor influencing the location of multi-national industry and the generation of new SMEs, particular if they provide access to international knowledge networks. Therefore the functioning of these networks is crucial for economic and social development within regions (Nijkamp et al, 1994). These considerations have been extended to the idea of the 'learning region', a concept which emphasises the importance of co-operation and mutual learning at a regional level for innovation and change in modern developed economies (Stahl, Nyhan, D'Aloja, 1993; Docherty, Nyhan, 1997).

The dimensions of learning partnerships and networks

A learning network can be defined as a network or a partnership of organisations formally set up for the primary purpose of increasing capacity for know-how and acting. In this

section we wish to examine the different dimensions of learning networks and consider how such networks might best be developed (Rauner et. al. 1995).

Dimensions of learning and qualification networks				
Configuration of network and structure of actors profile in the network	Subject of innovation	Strategies and competencies of these actors	Process of developing collaboration between actors	External and spatial dimensions
Specific elements and performance criteria within networks				
Joint values & congruence Roles Joint goals Size of network	Qualification Workplace development Technology development	Type of communications & relations; Actors focus & position Motivation Values	Trust & commitment Performance & reward	Environmental conditions: challenges and structures Forms of network structure

A key role for regional learning and knowledge partnerships and networks is that they facilitate the building and transfer of tacit knowledge by direct and continual contact between actors from different organisations based on spatial and cultural neighbourhood. Tacit knowledge is built and shared by direct face-to-face contact, discussion and observation. Spatial elements are also very important in the transfer of implicit knowledge and in facilitating innovation.

Regional networks for qualification and learning are based on partnership between enterprises and other regional 'knowledge institutions' including universities, innovation centres, technology centres, and vocational education and training providers. Although such institutions are deeply rooted in the local environment they offer, at the same time, 'the window to the global world' because science has neither regional nor national borderlines. Regional networks provide access to the global 'supply' of science-based knowledge. Institutions which would not participate in international networks can be linked through the region to global knowledge networks in order to avoid "entropic death" (Camagni, 1991).

It has been argued above that there are different kinds of networks. Successful regions are those "whose networks incorporate an adequate supply of quality knowledge resources, along with the ability and willingness of local firms to make use of external sources of knowledge with a clear focus on innovation" (Nielsen, 1994 cited in Huggins 1997). Up to now there is only limited knowledge about the different regional (and national) innovation systems in Europe. But it is argued that there is a need for a **robust networking culture** that can support the **inter-organisational flow of information and knowledge** between actors in different fields, especially between companies and the research and development institutions. Companies often fail to develop the advanced supply chain networks necessary for combining different forms of knowledge. This weakness is reflected in the slowness to adopt new forms of work organisation and the frequently negative results arising from such exercises (European Commission 1993).

In comparison with Japan, European countries have a *poor record of converting scientific and technology knowledge into commercially successful products and services*. There are barriers in the transfer of knowledge from researchers to industry and between enterprises (European Commission 1993).

Regional learning strategies for the configuration and development of regional networks: What have we learned so far from European network and partnership activities?

In Europe there is a rising awareness of the importance of partnerships and networking for learning and innovation. Many of the networks have been set up with the support of the European structural funds and the different programme funds. Others receive support at a local or regional level. The following section examines the experiences of regional networks in Germany, Sweden, Netherlands and Austria (Attwell 1997, Deitmer, 1997; Scheff, 1997; Nieuwenhuis, 1996; Hofmaier, 1996).

Despite peculiarities of region, nation and sector the SMEs supported by the different networks are facing similar problems:

- Lack of awareness of the importance of learning and innovation among entrepreneurs;
- Lack of appropriate technical support for companies seeking to implement new forms of work organisation;
- Transfer of experience between enterprises is rare;
- Consultants with adequate experience and expertise are hard to find and are expensive;
- Work organisation is often changed in ways that fail to address the underlying workplace culture, leading to frustrations;
- Lack of training and education among management of SMEs can lead to difficulties in articulating and formulating the right questions about development;
- Relatively low degree of education of the work force;
- A generally parsimonious attitude towards innovators and entrepreneurs;
- A lack of risk capital.

Following the experiences of the different projects the following key success factors for the establishment and implementation of a regional network have been identified. They are put forward as possible criteria for measuring the performance of networks: the nature of the *innovation dialogue* between actors; the *degree of integration* of the approaches to be undertaken; the *innovative capabilities* of the different actors; their *business process orientation;* the *diffusion intensity* of the regional network; and finally, the potential for *improving the (infrastructural) innovative capabilities of a region* (Deitmer 1997).

The need for leadership in the network: the spider in the net

Every network or partnership needs a 'networker' to get the ball rolling. This person or institution has to build awareness of the need for co-operation and partnership among different actors in the region. It is crucial to find promoters among the potential partner

institutions who are enthusiastic about the vision of a 'Learning Region' and strongly support the idea of establishing a network. The promoter does not need to represent one of the leading companies in a sector but he or she should be respected concerning his or her technical and social competence.

An interdisciplinary and cross-organisational approach to innovation

Innovation should transcend the classical boundaries of the scientific disciplines. When a network adopts a strategic orientation at a managerial level it should also address itself to the direct production or worker level. The goal is to shape organisations, technology and qualifications including the inter-relations between the management and the different departments of a company. Therefore networks should be developed between different organisations and not only within an organisation and should also take into account the interrelations between customers, users, producers and suppliers. Inter-disciplinarity requires the involvement of different actors with varied experiences.

Defining common goals for the network or partnership

It is important to define and agree common goals for networks and partnerships. The views around the different partners are often diverse. One central criteria will be to build consensus on the different perspectives and goals. In this phase constant dialogue through conferences and workshops is very helpful. It can be also be helpful to focus on two or three commonly defined and content orientated goals. One of the major tasks is to show the benefit for each network participant. Without pointing out the individual benefits the involvement of its members will decrease, possibly leading to the dissolution of the network. It is necessary to create awarenes of the need for co-operation and learning among participants, to show possible benefits and to build up an atmosphere of trust and mutual commitment

Steering of networks and partnerships: developing project management tools and techniques

Network relations are not only an arena where organisations and their members exchange information, but also a context in which they constantly interpret and reinterpret what is occurring around them. This implies a shift in focus onto the network or partnership through which new interpretations from the participants about the purposefulness of the network come into existence. New forms of evaluation and regular benchmarking are needed to reflect on the course the network has taken so far and what future activities are needed. To develop strong networks it is necessary to utilise benchmark tools and techniques.

Step by step approach

Every project and partnership should combine short-term and long-term goals. Especially at the beginning, the realisation of short-term goals is useful since these results show that it is beneficial to participate in a partnership, strengthening the commitment of the members. We have learnt in our case studies that much regional collaboration begins on

a small scale through informal collaboration and increases incrementally step by step. We see incremental innovations among the network partners as a way to develop common experience and knowledge. Since not all participants have the same initial knowledge, learning processes should accompany the development of the network.

Benchmarking workshops with all the network partners

Our view is that there is a strong need for systematic research, which will result in appropriate instruments or approaches for the evaluation of network activities and results. Besides the hard facts (outcomes in form of numbers of people reached, numbers of systems successfully installed), 'soft innovation factors' (e.g. new knowledge production, innovation environment and types of actors' involvement) should also be measured. At present these are frequently under-estimated as they do not match existing accounting and evaluation techniques and practices.

Given also the frequently dynamic and flexible nature of partnerships, there would seem to be a need to revise **evaluation and monitoring measures** reliant on limited and static indicators. One new tool for measuring the performance of networks is *"investigative and evaluative assessment workshops"* involving the core groups of actors in a regional network or partnership. A short structured questionnaire on the success/performance criteria can be utilised to promote discourse. Participants are asked to judge and weight the performance criteria for their network. It is the intention to develop a consensus about the strength and weaknesses of each network through the process of peer group evaluation and the application of social science research tools (qualitative and quantitative), participant observation and sociographic methods. Other new methods for the continuous project management and the evaluation of networks include *utility value analysis tools*, *innovation-spider-web and strength/weaknesses tools in a three-step evaluation procedure* (Deitmer et al., 1996, Rauner 1995).

Conclusion

Whilst there is increasing interest in the theories and ideas underlying the development of the learning region further research is necessary. From our initial survey of the work being undertaken in five different regions in Europe we have drawn the following conclusions.

Knowledge acquisition and product and process innovation is dependent on increased *collaboration* between SMEs and other institutions within regions. Product innovation is interactive in nature and requires both tacit knowledge and scientific knowledge.

From this we derive our basic hypothesis that the strengthening of regional networks for product innovation improves the innovation capabilities of SMEs. Developing regional learning networks is a critical task and is dependent on integrating the right partners. Innovation networks which are based on *continuous co-operation, competence and trust*, whose definition is based on effective *bi-directional communication* and supported by a *strong leader* (the so called 'spider in the net') have high chances of success. Externally initiated project networks that aim only to influence strategy frequently fail. These networks have a low dialogue culture and weak process orientation.

There is a need for constant monitoring and steering of regional learning networks, based on suitable evaluation and coaching tools. Adequate monitoring, evaluation and steering activities concerning the building and work of innovation networks can overcome the barriers to innovation in networks. Finally, regional learning networks should be supported by an *integrative regional innovation policy* backed up by *professional innovation experts covering all the policy fields involved.*

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CHAPTER 6

The Competitive Advantage of Regions

Felix Rauner

Why do some regions in Europe and other areas of the world advance and flourish? This is one of the most discussed and fascinating questions in the debate about globalisation. The internationalisation of research and the development of industrial mega-structures, driven by the impetus of information and communication technologies, suggests to observers that local, regional and national economies are nothing other than a reactive mirror of the globalisation machine. If we listen to many economists describing economic, technical and industrial development, the region is reduced to a dependent variable with no dynamic of its own. Looking at Europe, especially at the many projects launched by the European Union, we are suggesting a different reality. The dynamic behind innovation within the regions of Europe is drawing on the creativity and energy historically based on the innovative potential of the community. However for this to happen, regions must recognise the importance of learning. They must develop the ability to utilise the historic creativity of their people. In that way, it is possible to develop new scenarios for the future.

We describe these regions which give prominence to learning policies as 'learning regions'. The learning region is the driving force behind many innovation strategies within Europe. The leading US economist, Michael Porter, in his investigation of the competitive advantage of nations, stressed the importance of national traditions in technical and economic development. For many economists and politicians, especially those discussing globalisation, this came as a surprise. Michael Porter is right, however, when he says that competitiveness and the potential for innovation are based on national traditions. These traditions include education, work ethics and the specific set of political and cultural traditions which predicate the ability for innovation.

The US has shown the importance of democratic structures which offer individuals the maximum freedom of initiative, as a pre-requisite for innovation. From our European experience we would stress the importance of a social dialogue between employees, trade unions and employers and their associations, moderated and supported by science and research, as well as governmental guidance.

In Europe we are fascinated by the question of the importance of regions in the European unification process. What is the nature of best practice within the regions of Europe? What can less favoured regions learn from the more prosperous ones? For example, why is it that some small valley regions of Switzerland have, for hundreds of years, been the producers of the highest quality clocks and watches? Why are some Italian regions able to produce such high quality textiles and fashions? These examples provide us with a picture of what a learning region might be. The European projects presented at the Akron Forum illustrated different ways and stages of development of the learning region concept. They were based on a combination of different innovation capabilities and on the skills and

knowledge of regional actors from enterprises, universities and vocational training institutions.

However, it must be admitted that there is a certain tension between globalisation and regionalisation in Europe, especially when taking into account the fact that Europe is undergoing a process of unification. In this short paper, I would like to highlight four points showing how these tensions might be tackled, with a final fifth point addressing the issue of transatlantic co-operation.

Point One

The concept of competitiveness has to be based on an understanding of the competitive advantage of regions, not only nations. We have to discover the regional forces for innovation. This means developing an in-depth understanding of the nature of what the Italian economist Camagni calls a "rich regional innovation milieu". He shows that the identification of the different factors influencing innovation and development is not that simple. It is not possible to identify "innovative milieu" factors through mathematical formulae or to enumerate them by quantitative measures alone. Like Camagni we think that identifying the innovative milieu necessitates dialogue between all the regional actors. This dialogue is the basis for a more action and shaping-orientated innovation research.

Point Two

Regional dialogue and close co-operation between actors in the region are important pre-conditions for the emergence of the learning region. What does co-operation mean in this context? It has to support individual engagement as well as the development of common concerns. Co-operation must be followed by co-ordinated action. This calls for communicative and interactive skills for the different people involved in the dialogue.

Point Three

The many traditions of European industrial culture are directed and reinforced by the continuity and growth of small and medium sized enterprises. They are the backbone of the European economy. The basis of these enterprises is the knowledge and skills of their workers, learned through vocational education and training. These education and training structures and traditions enabled European countries to avoid the de-skilling of the workforce in the course of the development of mass production systems over the last century. Nowadays, new methods of production based on the competence of the workforce are gaining importance. This brings us back to the necessity of a self-organised and highly qualified workforce on the shop floor. If Europe is able to encourage the indigenous power in the regions, and to develop the potential of trans-regional structures, a new form of a wider European network – a region of the regional networks – can emerge. I am quite sure that this will develop synergies in which the science-based knowledge and the tacit knowledge of the different innovation agents can come together.

Point Four

Europe displays cultural, economic and technical traditions different to those of the US. Successful regional policy has to identify examples of best practice and investigate its nature and genesis. Based on this understanding it will be possible to assimilate other less successful regions into this development process. I am quite sure that for this there is the need to develop new types of democratic regional structures. Europe has not always succeeded in developing such structures for innovation. For example the religious and political conflict in Northern Ireland, Cyprus and the former Yugoslavia, to name a few examples from different European regions, shows how much effort has to be undertaken to take Europe on its pathway to a Europe of regions.

If we can understand the diversity of the European regions as a cultural richness and are able to transform this into political, economic, scientific and practical actions then Europe will be able to develop a stronger learning community. The new Europe can build an understanding of itself as a union of learning regions.

Point Five

Transatlantic co-operation with the US, bringing together regional partnerships with similar goals, gives Europeans the chance to define themselves as Europeans and not as representatives of the different nation states. In this regard, I want to venture three important insights. First, work and learning activities in the European context, have to be viewed from an internal perspective but also from an outside one – that means comparing regions and matching inter-active project partnerships. Second, it is not enough for European networks to understand their view of the world by their own relative criteria. Third, although all Europeans are happy to use English to promote transatlantic dialogue, it is important that the United States never forget that we are not all native speakers of English. The growing together of the people of Europe cannot be achieved by standardising our cultures or adopting a single language and culture. The European project is based on all our different languages. Americans can only understand the European project when it is appreciated that the integration process is different to the historic development of integration in the United States.

Introduction to Part Two

Regional Case Studies – Theory and Practice

Part Two contains five regional-oriented learning case studies, presented against the background of their underlying or related theoretical frameworks.

The first paper by Glover entitled "Taking the High Technology Path to Economic Development in Austin, Texas" addresses the issue of building co-operation between diverse actors (development bodies, private companies, schools and universities) to improve the supply of well qualified young people to meet the needs of the dynamic Austin economy. It traces the development stages in setting up a number of innovative co-operation infrastructures (including, in particular, the brokerage role of the Capital Area Training Foundation) which have been put in place to address the workforce development needs of the high technology industries in Austin.

The two papers by Niewenhuis ("Vocational Education Institutes as Regional Agents in the Netherlands") and the one by Scheff, entitled "Integrated Strategies for Competence Development in the Graz Area in Austria" both argue that linear models for knowledge transfer must be replaced by interactive models. Niewenhuis outlines how a vocational education institute, standing at the crossroads of regional and sectoral policies, can build up the "collective learning capacities" of companies in three different sectors in the Netherlands. Scheff and Franzen show how a "learning pyramid" model, connecting company, inter-company and regional levels, has been applied in the region of Graz in Austria.

The fourth paper by Hofmaier ("Regional Development and Learning: Case Studies in Southern Sweden") is a reflection on the development of three networks related to: manufacturing, women entrepreneurs and the public sector. He stresses the importance of having soundly based dialogue and communication frameworks in order to achieve lasting transformations.

The final paper in Part Three by Greenstein and Robertson entitled "Learning from Disequilibrium – the Case of Boston, Massachusetts", is a suitable one to close this section of the book in that it poses the question to what extent the Boston metropolitan region can be called a 'learning region' in a rounded sense, addressing both economic and social perspectives. They conclude that while Boston has learnt economically in line with Hirschmann's theory of learning from failure (or learning from disequilibrium) it cannot be said to have done so from a social viewpoint as there are still many serious problems of inequality with regard to income and access to education and other services.

CHAPTER 7

High Technology as a Path to Economic Development in Austin, Texas

Robert W. Glover

Introduction

Austin was founded as the site of the capital of the Republic of Texas in 1839. For much of Austin's history, its economy was known as a center of government employment and a college town, the location of one of the state's flagship universities. State government agencies provided a secure and growing base of employment, but the city was considered slightly disadvantaged in not having any part of the Texas signature industry – petroleum. A century and a half later, the situation has dramatically changed. Petroleum is on the decline in Texas and Austin's economy has become a center of high technology in a global knowledge-based economy, offering an exemplar for the state and propelling the Austin metropolitan area into one of the largest and fastest growing regions in the nation.

The growth of Austin as a center of electronics and information technology (IT) has been faster than any other region in America, including Silicon Valley in Northern California and Route 128 in the Boston area. As of 1998, Austin was home to more than 800 software development enterprises and one of the primary American centers of semiconductor production. Several well known, progressive firms with names closely identified with information technology have located research and/or production facilities in the Austin area, including AMD, Applied Materials, Dell Computers, Cyprus Semiconductors, IBM Corporation, Intel, Motorola, National Instruments, Raytheon, Siemens, Solectron, SAMSUNG, Texas Instruments, 3-M Corporation, and Tokyo Electron.

Austin has long been on an impressive growth path. The population of Austin has doubled every 20 years since 1880 with only one exception (between 1900 through 1920). Remarkably, growth is continuing at this same pace. During 1997, Austin was the second fastest growing metropolitan area in the US ; only the Las Vegas area grew faster. Even more impressive has been Austin's robust economic growth. Employment has expanded at a rate double the population growth during various "boom" periods over the past two decades; whereas population grew at a rate of three percent per year, the number of jobs was expanding at six percent annually. Unemployment rates in Austin consistently have ranked as either lowest or next-to-lowest of any local area in Texas for more than two decades. Austin's economic outlook remains favorable into the long-term future according to analysts who have studied it most closely (Angelou Economic Advisors, Inc, 1997; Greater Austin Chamber of Commerce, 1997). Moreover, Austin has reached a stage of "take off" with increasing entrepreneurial activity and availability of venture capital.

Conscious Strategies, Fortunate Circumstances

Austin's economic success was achieved in part through intentional strategies taken by the Greater Austin Chamber of Commerce, government officials, and other leaders in the region, to foster growth. Austin has been known nationally for its collaborative policymaking by local officials, who have been able to enlist support, when needed, from the governor of Texas and other state officials and tangible assistance from the University of Texas at Austin in campaigns to attract those considering locating in the region.

The economic development efforts of the Greater Austin Chamber of Commerce have been guided by two strategic planning studies, which were commissioned and published by the Chamber in 1985 and in 1998 (SRI International, 1985 and ICF Kaiser International Economic Strategy Group, 1998). These reports outlined the options available to Austin. The conclusions reached by these studies achieved widespread consensus and helped to provide direction to Austin's business community.

Austin's conscious strategy for economic growth has been characterized by the following features:

Leadership from business

The Austin business community took the lead in attracting industry. Others, including the City of Austin, Travis County, and various Texas State Government agencies, have played supportive and collaborative roles.

Focus

The campaign has been targeted at firms who sold more than 50 percent of their services outside of Austin. Since the publication of the 1998 strategic planning study, efforts of the Chamber have narrowed to develop businesses in ten specific industry clusters:

1. electronics
2. semiconductors
3. computers and peripherals
4. software
5. multi-media
6. biomedical products
7. logistics and distribution
8. transaction services
9. film
10. music

Research collaboratives

Special efforts were made to attract high-profile industry research collaboratives, especially the privately-sponsored Microelectronics Computing Consortium (MCC) in the electronics industry which located in Austin to 1983. The same is true for SEMATECH, a public-private research consortium, (formed by the federal government and several semiconductor manufacturing firms, to meet the challenge posed by Japanese producers who were increasing their market share), and which chose to locate to Austin in 1988. Following the lead of these consortia, several of their member firms and their supplier companies decided to locate major facilities in Austin.

Postsecondary education

The development of research and education at the University of Texas at Austin has been a primary factor in the knowledge-based economy, especially colleges in engineering, computer sciences, and business administration.

Increasing attention to entrepreneurial development

Conscious efforts have been made to develop a climate to facilitate entrepreneurial activity, especially in high technology industry. Austin established one of the first technology incubators in the United States. It was initiated by Dr. George Kozmetsky, who served as Dean of the University of Texas School of Business and founded Innovation, Creativity, Capital (IC^2 Institute), now a world-renowned research facility specializing in issues of technology and the global economy. A recent national study involving researchers at the University of Michigan and others, has documented the success of technology and business incubators in fostering the creation of new firms and jobs (Molnar, et al, 1997). Providing a forum for education and encouraging information-sharing among the aspiring entrepreneurs, whose firms are located in the same building complex, are integral features of the Austin technology incubator model.

A regional orientation

The Greater Austin Chamber of Commerce has largely ignored political boundaries in its efforts to attract industry to the region.

Encouragement of communication, networking and collaboration

The Chamber holds a wide variety of functions to promote networking among its membership. The IC^2 Institute established the Austin Software Council to facilitate communication among software developers and sponsors a variety of functions and strategies to promote dissemination of knowledge.

Perhaps equally as instructive as the techniques used are those *not* relied upon by Austin. For example, property tax abatements have been used only sparingly in the Austin area and in no cases have school district taxes been abated. The rare and selective use of tax abatements is especially interesting because the subject of tax abatement has received considerable attention in American literature on incentives influencing industrial location (see for example, Fisher and Peters, 1998). It should be acknowledged, however, that Texas remains a generally low-tax state and one of the few states without a state income tax on individuals.

Admittedly, Austin's robust growth has also been facilitated in part through good fortune, including such factors as natural attractiveness, an abundant supply of good water, an attractive quality of life, good climate, historically low wages, and (until recently) low-priced housing and low cost-living expenses.

Learning Systems

A key factor in Austin's growth has been the development of learning systems, especially at the postsecondary level. Austin has enjoyed special advantages in the production of

workers with college degrees. One survey made in the early 1990s revealed more than 100,000 individuals enrolled in courses in the area's nine colleges and universities with more than 15,000 college degrees being produced annually, as compared with only about 5,000 high school diplomas. Of these, fully 11,000 diplomas at the baccalaureate, masters, and doctoral level were awarded annually by the University of Texas at Austin, one of the nation's leading research universities. Many students who come to the region to attend college prefer to stay in the area after graduation, sometimes sacrificing opportunities for greater earnings they could achieve elsewhere or compromising their career aspirations.

Austin enjoys a reputation as a comfortable place to live, with a good environment and "high quality of life." This has facilitated the ability of firms to recruit and attract highly educated people from other areas. Austin's population now ranks as one of the most educated in the US, as measured by years of educational attainment. As one indicator of this, Austin often ranks highest in the nation in per capita spending on books.

Counting the occupational preparation offered by local college and universities, including schools and colleges devoted to studies of business, engineering, architecture and planning, nursing, law, education, communications, public affairs, and others, well over a billion dollars in public funding, mostly from the state of Texas, is devoted to workforce preparation. At least an additional billion in funding, from the federal government and various private sources, is invested in various research and development activities in Austin.

A more difficult challenge has been building regional learning systems to produce adequate supplies of skilled and technical workers at the non-university level. This form of education has lagged behind significantly. An example can be found in semiconductor manufacturing. In 1992, both Motorola and Advanced Micro Devices broke ground in building major production facilities in Austin. Within two years, these plants (or "fabs" as they are commonly called in the semiconductor industry) were in operation. However, it was not until a full year later in 1995 that Austin Community College was able to start a program with a curriculum to train semiconductor manufacturing technicians. Relative to the time taken to establish other new technical occupational programs in public schools or colleges, the implementation of the semiconductor manufacturing technician program at Austin Community College was a remarkably rapid development. It grew successfully in three short years, reaching an enrollment of more than 450 students in the fall of 1998. However, the program generally takes students at least five semesters to complete, and 70 percent of them require even longer because they attend college on a part-time basis, working during the rest of the time to support their families. Thus, even though the program is offered in various options and course configurations at Austin Community College, ranging from an accelerated 36 week certificate course to a full two-year associate of applied science degree course of study, the Austin Community College was able to produce no more than three dozen graduates during the 1997-98 school year – more than six years after the major expansions were announced and four years after the production facilities were in operation. Even though Austin is now America's leading location for the production of semiconductor chips, the curriculum and facilities for

producing a workforce of operators and technicians for the semiconductor industry are only just now coming into place.

The story at the secondary school level is even more striking. In 1994, the year that the major new semiconductor facilities went into production, the Austin Independent School District, the major school district with fully one-third of the region's total school enrolment, decided to drop its only program providing technical education in electronics for the high technology industry. The instructor who had been teaching the program retired and the school district was unable to replace him at the low salary levels they were willing to offer. In addition, the program had difficulties attracting students because, even though its courses were quite challenging, they were not required for high school graduation. Finally, this program in technology and electronics was widely perceived as a program for students not intending to continue their education in college. Given the strong pro-college bias in American society and especially in Austin, this perception was a major barrier to attracting students who could competently handle the levels of mathematics and science required for this coursework. Similar situations prevailed in computer applications, computer programming, and network administration. Thus in spring 1994, not a single program in any of Austin's ten public high schools offered students any technical preparation for working in Austin's high technology industry. At the same time, several of these same high schools were teaching students subjects such as cosmetology, automobile mechanics (in programs neither reviewed nor certified by industry), home economics, agriculture, and animal science.

Another glaring example of the sluggishness of schools in changing, and to be contrasted with the far greater speed at which business must move to survive, can be found in the installation of computers in Austin's public schools. A bond issue, passed in a 1996 election, included funding for wiring and installing computers as part of the instructional process in every Austin classroom. Three years later, the task remains uncompleted. In some schools, it has not even started, and questions are arising about the adequacy of funding to complete the work.

The Capital Area Training Foundation

Noting the numerous deficiencies in the preparation of an appropriate technically trained workforce for the area's developing economy, the Austin business community began mobilizing in the early 1990s. In Spring 1994, the Greater Austin Chamber of Commerce, in collaboration with the City of Austin, formed a special-purpose, industry-led, non-profit organization entitled the Capital Area Training Foundation to work as an intermediary or broker between schools and industry. This initiative was inspired in part by colleagues in Koblenz, Austin's sister city in Germany which in Spring 1994, provided a briefing on the operations of the dual (apprenticeship) system in Koblenz to Mayor Bruce Todd and a sister city delegation. This visit was followed by several others, along with generous advice, guidance, and even a series of training exchanges, especially with the Handwerkskammer Koblenz (Glover, March, 1996).

The Capital Area Training Foundation aims to establish long-term education and workforce development solutions to address shortages in the Austin labor market. The

Capital Area Training Foundation has a dual mission: to develop a skilled workforce for Austin area employers and to prepare young people, including young adults, for lifelong learning, citizenship, and career success. [9]

In existence for only five years, the Capital Area Training Foundation has already established a strong track record of accomplishment. It has helped to develop various high technology "career pathways" in each of Austin's high schools, offering instruction in such subjects as industrial electronics, computer-aided design, computer networking, and multi-media applications. Several of these courses offer high school students opportunities to achieve college credits while still in high school. Some of the computer laboratories and other facilities with high capital costs are operated on a joint basis, used for high school students during the day and by community college students and adults in the evening and on weekends. The Capital Area Training Foundation brokered the establishment of a pilot career preparation program between the Advanced Micro Devices (AMD) Corporation, two local high schools, and Austin Community College entitled "Accelerated Careers in Electronics" or ACE. ACE covers courses beginning at the second or third year of high school and extending into postsecondary education at the community college or university levels. Efforts are now underway to expand the ACE program into a regional industry-educational partnership that produces at least 1,000 graduates per year. Major industry associations including the American Electronics Association, SEMATECH, and the Semiconductor Equipment Manufacturers International (SEMI) – an association of supplier firms to the semiconductor industry – and Austin-area electronics firms are becoming engaged in this initiative.

The Capital Area Training Foundation has established steering committees in several industry sectors facing workforce shortages in the Austin labor market. Its high technology/electronics committee has blossomed into several working subgroups, including computer network administration, software development and multimedia, and semiconductors. In addition to the high technology/electronics sector, steering committees are active in the following industries: construction, criminal justice, automotive service, healthcare, and consumer services including occupations in the culinary trades and hospitality industry. A new industry steering committee is emerging in environmental studies and career paths are being organized in teaching.

Wherever possible, Austin's steering committees work with and through existing industry associations, such as the Associated General Contractors and the Associated Builders and Contractors in the construction industry, the Austin Automobile Dealers Association, the Austin Hotel-Motel Association, the Texas Restaurant Association, and the Austin Software Council.

The Greater Austin Chamber of Commerce has maintained its interest in workforce development issues during the 1990s. In fact, workforce development has ranked as the top priority item each year since 1990 in the Board of Directors annual retreat devoted to determining strategic directions for the organization. As one tangible consequence, the "Adopt-A-School" program, jointly operated by the Chamber and the Austin School District

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[9] For a fuller description of the origin of Capital Area Training Foundation and its activities during its first two years of operation, see Glover, October 1996.

since 1983, has been reformulated as the "Partners in Education" program with its collaborations to be more focused on producing improved student academic achievement and workforce preparation.

At the end of 1998, the Greater Austin Chamber of Commerce entered a new and expanded phase in its workforce development efforts. The Chamber hired the executive director of the Capital Area Training Foundation as its own executive vice president for workforce development, and then loaned him back to the Training Foundation. In addition, the Chamber also committed itself to provide $1.25 million in private funds over the next five years to finance the administration and brokering of school-to-career efforts through the Capital Area Training Foundation. This five-year time horizon offers an ideal time frame for long-term strategic planning, targeting specific outcomes to be achieved. The new structure more closely ties the two organizations and their activities together while maintaining them as separate entities. It also better integrates workforce development with economic development efforts.

Although considerable progress has been made, Austin's efforts to produce a workforce with skills better aligned to local economic requirements are still developing. Much remains yet to be accomplished in the arena of work-based learning systems. For example, the University of Texas has been slow to respond to the continuing learning needs of the Austin's incumbent workers. Other postsecondary institutions are stepping in to fill that vacuum, including Austin Community College, Southwest Texas State University, and St. Edward's University, as well as education/training institutions formed by corporations, such as Motorola University and Dell University.

As Austin grows into a major metropolitan area, the challenges and prospects now facing it are becoming more difficult, diversified, and complex. Along with the continuing need to make improvements in the region's workforce development and learning systems, other challenges to the quality of life for Austin residents are rising. These include developing an overburdened transportation infrastructure that has not maintained pace with growth, coping with rapidly inflating housing costs (the highest of any city in Texas in 1999), promoting continued economic growth and diversification, and countering urban sprawl and the threats of environmental degradation.

In Conclusion

Austin's workforce development efforts have begun to pay off. Indeed its workforce programs have attracted national attention.[10] With so much favorable publicity, the Austin economy is almost certain to move into the next century at full throttle The educational and training initiatives taken have provided the Austin business community with the "arms and legs" to implement improvements in local systems to produce a better-prepared workforce. In addition, these programs have given industry a more unified and effective voice in speaking to schools and training providers. Although it is still likely that its workforce development programmes will continue to come under pressure in the future, based on its track record, Austin's business community appears to be very capable of putting practical mechanisms in place, in partnership with educators, to address future challenges with confidence.

[10] Austin's efforts with the semiconductor industry were the focus of two special television news reports prepared by Hedrick Smith and broadcast nationally in July 1998 on the public television newscast "The News Hour with Jim Lehrer." Austin was featured in a cover story, entitled "Building Better Workers," in the national magazine published by the U.S. Chamber of Commerce (See U.S. Chamber of Commerce, June 1998). The Capital Area Training Foundation and the Austin initiatives now regularly receive mention in the growing national literature on workforce development and school-to-work systems (e.g., Olson, 1997; Committee for Economic Development, 1998). Austin's reputation as a center for business and high technology development and creativity likewise advanced during 1998. The city received considerable favorable publicity in the national press and in business magazines. In January, the *New York Times* featured an article entitled "Austin Rides a Winner: Technology" (Verhovek, January 31, 1998, p. A-7). An October 1998 issue of *Forbes* magazine touted Austin as a growing center for entrepreneurship in the software industry (Fisher, October 19, 1998, pp. 108-110.) In November 1998, *Fortune* magazine ranked Austin as the best city for business in North America (*Fortune*, November 23, 1998, pp. 142-156). The same month, a cover story in *Newsweek* magazine listed Austin among the ten "Hot New Tech Cities" (Levy, November 9, 1998, pp. 45-56).

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CHAPTER 8

Vocational Education Institutes as Regional Innovation Agents in the Netherlands

Loek F.M. Nieuwenhuis

Introduction

The Spidervet project examines the role of institutions for vocational education and training (VET) as facilitators of innovation within regions. This facilitating role demands a high degree of responsiveness; VET colleges should be able to react quickly to changing labour market demands in their region.

Spidervet is targeted at the development of practical organisational models for VET colleges. Good practices are surveyed in six European countries. Based on these experiences, Spidervet will deliver a handbook and policy recommendations.

VET and innovation

Innovation is important for the competitiveness of enterprises and industrial sectors. It is a complex process of interactive network learning and trial and error processes on the shop floor. For small and medium enterprises, this innovation process can be facilitated by external institutes. Both sectoral organisations and regional colleges for vocational education and training have a role to play here.

The precondition is that the VET system is able to cope effectively with the challenge of responsiveness to new skill requirements. Responsive VET systems can be a major instrument in the dissemination of R&D results towards SMEs. VET colleges are challenged to function as pivotal actors in regional innovative learning networks.

Four actors in sectoral-regional innovative arrangements

The thematic basis of Spidervet is founded on former case studies, which have been undertaken in several Dutch industrial sectors with a large proportion of SMEs (Grooters & Nieuwenhuis, 1996). The intermediate knowledge infrastructure in three industrial sectors has been studied in: the greenhouse farming sector, the installation engineering sector and the bakery sector.

Based on these cases a sectoral/regional innovation model has been built, in which four actors play a major role: SMEs, research and development bodies, sectoral innovation agents, and VET institutes.

Small and medium enterprises have to be innovative to improve their competitiveness; they use knowledge from different sources but they also produce new knowledge. Institutes for research and development produce ideas and new knowledge, but they have

problems in disseminating this to SMEs. In several industrial sectors, innovation centres have been established, targeted at the translation of innovative knowledge to enterprises. Social partners play an important role in the funding of these centres. Regional innovation centres play a facilitative role in disseminating innovative knowledge. VET providers have the opportunity to play a role in regional networks through educating young people, training workers and organising learning networks for enterprises.

Understanding innovative processes

National and European policy makers believe in investment in technical-oriented research programmes as a major impulse for innovation in industrial sectors. The prime target of these programmes is the production of new knowledge and techniques.

However, the results of science and technology development are not easily implemented in the primary production process. Many small and medium sized enterprises have problems in finding and adopting new knowledge. To help implement the results of research and development projects, sectoral and regional innovation centres were developed in the Netherlands and other European countries during the 1980s.

Recent studies on innovation (see Coehoorn, 1995; Engel, 1995; Röling 1992) show that linear models for knowledge transfer should be replaced by interactive models for innovation processes, in which trial-and-error processes on the shop floor are interrelated with existing knowledge bases within the research infrastructure. Problem solving and innovation through trial-and-error processes can be seen as informal learning processes, in which social networks play an important role. Workers learn by sharing knowledge in the working team and employers learn by creating networks of colleagues and advisors.

Policies for facilitating innovation combine linear and interactive innovation models. Enterprises can be transformed into learning organisations in which training, informal learning and innovation are normal processes on the shop floor. Innovation works if it is an embedded process. On the other hand, enterprises need easy access to external knowledge sources, where the latest results of science and technology progress are stored and updated. Regional networks, comprising enterprises and research institutes, form a firm base on which innovation can flourish. VET colleges can play a major role in harnessing these regional resources.

Three roles for vocational education and training (VET)

To enhance such knowledge-transfer processes, vocational education and training organisations can play three roles in:

- the education and training of new employees to develop the knowledge base in companies;
- the supply of up-to-date information and training facilities which will update the knowledge and skills of the workforce;
- organising active networks of enterprises to facilitate interactive learning processes.

Training institutes take up the challenge of the knowledge transfer process by ensuring a high degree of responsiveness to the results of science and technology developments.

The method of analysis adopted here has been based on a model in which theories of industrial innovation, (Engel, 1995; Coehoorn, 1995), investment in human capital, (Finegold, 1991), and flexibility in training, (Nijhof and Streumer, 1994) are combined. Central to the model are intermediate structures established by industrial sectors to enhance communication between research and development and VET systems. These intermediate structures are dependant on sectoral features (economic cohesion, co-operation between companies, relevance of human capital), innovation processes (interactive vs. linear; market or science oriented), and on features of the sectoral training and innovation system (school/company based; job or domain oriented; or based on collective agreements).

VET is standing at the crossroads of regional and sectoral policy perspectives. Craftsmanship is highly sector bound, because of the intertwining of occupational domain and economic activities. Educational policies in VET are more or less connected to sector policies, depending on national VET systems and socio-economic constraints. VET institutions have to build both sectoral and regional networks to operate effectively in supplying a well qualified labour force, prepared for life long learning and innovative employment.

Regional challenges

Morgan (1997) stresses the importance of the network paradigm in understanding regional development strategies. He emphasises the importance of creating learning regions, analogous to the concept of learning organisations, building up collective learning capacities between geographically related enterprises. Strong industrial districts seem to be characterised by learning interrelations between the enterprises. Italian industrial districts are characterized by mono-productivity; each district is famous for a single set of products. Learning and exchange of expertise is essential to maintain quality. Other emerging regions are characterised by supply chain relations; exchange of innovation and information is related to purchasing and selling activities.

In underdeveloped regions these kind of learning networks are non-existent, due to a lack of economic activity and a poor infrastructure. The challenge for regional or local authorities is to establish labour market policies which lead to high levels of learning, and to develop networks of entrepreneurs, especially in start-up companies. To reach that target, regional VET providers should be pro-active in developing strong alliances with knowledge providers such as innovation centres and 'sector knowledge centres'. This is one of the targets of the regional development programme of the European Commission. EC policies, for example, European Business and Innovation Centres, targeted at the interrelationship between SMEs and higher education, can provide a framework for these developmental programmes.

Regional challenges for enhancing industrial innovation and learning processes include developing learning networks for enterprises, facilitating the development of infrastructures for technology transfer and educating a high-skilled labour force.

Sectoral challenges

Industrial sectors offer possibilities for developing innovative activities within SMEs. According to Finegold (1991), industrial sectors should look for ways to facilitate cooperation between enterprises and promote investment in training and innovation. There is a danger of falling into the low skill trap: individual enterprises will decrease their investment in human resources if they are threatened with poaching by their competitors. So industrial sectors have to develop policies which lead to cooperation in the promotion of training and innovation.

Sectors should aim to build infrastructures for technology transfer and training policies based on co-operation between companies. In order to develop these sectoral policies, systems are needed for the monitoring of future technology developments. The results of monitoring activities can be translated into transfer-supporting measures and skill requirement forecasting.

Sectoral challenges to facilitate innovation and learning processes include – establishing the pre-conditions for collaboration between enterprises in the field of training and innovation; building future oriented monitoring systems for technology development; building support systems for company innovation and training; defining the key competencies for skilled workers and entrepreneurs; and creating sectoral ownership of vocational education and training systems.

Spidervet

The Leonardo project Spidervet is taking up the organisational challege of facilitating regional learning and innovation. VET colleges develop learning network strategies in their region and information networks in their economic sectors. As a "spider" in different knowledge networks, they have (or develop) the potential as innovation knowledge brokers. In the Spidervet project the feasibility of this challenge is investigated through comparative case studies undertaken in six European countries. The following section is based on the first Dutch studies undertaken in the project.

Greenhouse farming

Greenhouse farming is a prosperous sector of Dutch agriculture. Vegetables, flowers and plants are exported all over the world. However, greenhouse farming is confronted with change. The Dutch government is stepping aside from its leading role. Economic developments in the global food market will in the future be the major impulse for the agricultural sector. A major economic tendency is the shift of power in the different food chains. Formerly, the suppliers in the food chain had great power. In the last decade, however, the balance of power has changed in favour of the consumers, as represented by the supermarkets. Because of this shift, traditional cooperative structures are breaking down and are being replaced by structures based on competition.

Structural changes have also had an impact on the agricultural knowledge system. The knowledge system for greenhouse farming is oriented traditionally towards the farmer. Employees in the sector are usually poorly educated. Greenhouse farmers are the key to the introduction of innovative processes. Individual farmers or networks of farmers must

have direct influence on the research programmes, while the results of research become available to them through continuing training programmes. Economic shifts affect the operation of the knowledge sharing system. Farmers build competitive barriers and consequently cooperation in the knowledge production system is adversely affected.

Within the agricultural knowledge system, the role of agricultural education and training is in danger of marginalization. Vocational education is still seen as the major supplier of future farmers, but the role of education in the innovation processes within the sector is decreasing more and more. Agricultural education systems have difficulties at a national level in obtaining the necessary information to respond adequately to innovation. At a regional level the education institutes do not support knowledge networks around the farms.

Installation engineering

The installation engineering sector deals with plumbing, fitting, air conditioning and central heating installations. In the last two decades, the sector has defended its economic market share very effectively. The sector is highly dependent on developments in the building sector. Mechanical installations in buildings are the entry point to utility projects. Emphasizing its professionality, the installation engineering sector succeeded in keeping its market share. Both employers and workers agree on the need for craftsmanship and investment in training. For this, each year 1.15 per cent of the total wages in the sector are put aside for training and innovation activities as laid down in collective agreements.

Installation engineering is an "innovation-following" sector. Innovations are designed during integral design processes for utility building or via research and development activities in the supply industry (e.g. new heating technology). Innovations are disseminated in the installation sector following the linear model. To facilitate innovation processes, the social partners in the sector founded Intechnium, a sectoral innovation and training centre. Intechnium took on, over a period of five years, an important role in monitoring technology developments, translating them into training and disseminating activities.

In the installation engineering model, vocational education and training has a reactive role. Intechnium formulates the training requirements, based on information from its regional organisation and designs the training materials. Vocational colleges are asked to supply training courses. In addition, the maintenance of the qualification structure for initial courses is directed from the same monitoring structure. This model fits well into the linear way of innovative processes in the sector, but it does not enhance regional learning networks of companies and colleges.

The bakery sector

In the bakery sector, craft production has stood its ground against industrial bakeries. Both have about half of the Dutch bread market. A threat is the shift in selling points, supermarkets sell 60 per cent of the bread produced. The traditional bakery is confronted with a struggle for its life. For the Dutch market, it is expected that a large number of consumers will continue buying their bread in small bakery shops. Bakers in the Netherlands are educated at the bakery school in Wageningen, whereas general

employees get their training in apprenticeship courses. The sales personnel are educated in other schools. Employers' organisations and trade unions in the bakery sector agree on the importance of training, however, a strong training tradition does not exist.

The bakery sector is rather traditional: major innovations do not occur. Small bakeries do not change dramatically, and even industrial bakeries are adopting process automation at a rather slow pace. Innovation takes the form of new equipment such as computer-guided ovens and dough mixers. The supply industry is the motor behind these innovations.

Recently, the National Bakery Centre was founded, in which several sectoral organisations were merged. However, the bakery college is not involved in this centre. The intermediate knowledge infrastructure in the bakery sector is still developing and the communication and information lines are not yet clear. The weak training and innovation tradition, combined with a dislike of centralism, could be an explanation for this slow development.

Comparisons

The VET system for greenhouse farming is school-based and employer-oriented. In the two other sectors, VET is oriented both towards employers and employees and apprenticeship schemes are used. In the installation engineering sector the social partners are highly committed: they invest a lot of their common funds in training. The craftsmanship of employees is seen as a crucial competitive factor. In greenhouse farming, on the other hand, expertise is concentrated in the entrepreneurs and the education of entrepreneurs is seen as a government task. There is no tradition in the training of employees.

There are large differences in the organisation of R&D and innovative processes between the cases. An interactive innovation model can be observed in greenhouse farming, whereas the bakery sector and the installation engineering sector can be described as following a linear model. Innovation policies in those two sectors are built on linear directives, which is recognisable in the way innovation centres are operating. The innovative impulse stems from the supplying industries, and sectoral institutions try to coordinate the different knowledge sources. In greenhouse farming, as in other agricultural sectors in the Netherlands, a strong research tradition is facilitated by government and European Community policies. In the last decade European and national policies are changing dramatically towards a more market-led system. Public investments in the agricultural knowledge system are being replaced by sectoral and private investments.

The intermediate sectoral systems for the transfer of new knowledge vary according to the differences in training and R&D systems. The installation engineering sector is very successful in co-ordinating and monitoring new developments. The network approach, which can be observed in greenhouse farming, is more flexible, based on cooperation betwen individual entrepreneurs.

Vocational education and training colleges have a role in knowledge transfer processes in the bakery and installation engineering sectors, whereas in greenhouse farming,

agricultural education is in danger of being marginalized in relation to the innovation processes in the companies.

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CHAPTER 9

Integrated Strategies for Competence Development in the Graz Area in Austria

Josef Scheff

Introduction

Paradoxically in the age of globalisation, there is also a tendency towards regionalism. This has been discussed intensively for several years in the framework of competence and qualification development. The building of regional networks among companies, local (or regional) training institutions, research bodies as well as regional agents is considered important with regard to knowledge development, the promotion of innovativeness and the development of employees in small and medium sized companies. The importance of all this is demonstrated by the various competence development activities initiated by regional consortia and networks in the last few years.

All these approaches and projects can be summarized under the heading of the "Learning Region". The main areas worked on in these projects relate to qualification formation, increasing companies' ability to adapt to industrial change though investing in human resources and building co-operation between research institutions, SMEs and other regional institutions. Learning is seen as a social process where individual and institutional agents work together on specific topics. The process of developing and transferring knowledge is based on the joint interpretation of experiences. Regional networks relate to knowledge bases which contain explicit as well as tacit knowledge (Nonaka/Takeuchi 1995, Scheff 1997a). The "Learning Region" provides a spatial context for networks to develop new innovation and learning strategies. Investment in human resources and education policy aspects are discussed at the same time as economic, regional development and labour market questions.

This article elaborates these ideas in the context of a project[11] being carried out in the Graz area of Austria.

Regional setting

The opening up of Eastern Europe and the entry of Austria in the European Union created an economic internationalisation and brought advantages to the province of Styria and especially the Graz area, which when compared with other agglomeration areas in Austria, has a rather weak growth rate (cf. Grazer Substanzkatalog, 1995, p.3).

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[11] The ADAPT-project „Learning Region Graz" is funded by the AMS-Styria (Public Employment Service) and ESF

Industrial structure

Most of the companies in the Graz area are Small and Medium Sized Enterprises (SMEs) with less than 250 employees. In total, about 7,600 companies employ around 77,000 people (representing 66 per cent of the total labour force). Most of the SMEs belong to the craft and trade sectors with a lesser number in the tourism, transport, industry and financial sectors. Company development as a whole is declining. Between 1987 and 1991 the number of small companies decreased by 5,4 per cent. In analysing the secondary sector (industry and craft) a highly diverse and heterogeneous structure appears. The high standard of education and the reasonably sophisticated research institutions make Graz a very attractive centre for high-standard industrial production, especially in the automobile and electronics industry segments. However, the percentage of low-tech industries and other "problem" branches (e.g. the food and beverages and textile and clothing industries) is very high. The current trend in company re-locations concerns these low-tech sectors and "problem" branches. New business start-ups and the expansion of other companies do not compensate for shortfalls.

Population/labour market developments

About 30 per cent of the Styrian population lives in the Graz area (about 355,858 inhabitants). Commuters raise this number during the day. Developments in the labour market show that although there is an "over-supply" of 3,800 jobs in the Graz area (i.e. the number of jobs has grown more quickly than the labour supply), the unemployment rate has risen. This paradoxical labour market phenomenon can be partly explained by structural unemployment. Even though the percentage of well qualified unemployed is very high, companies demand qualifications that cannot be supplied. Long-term unemployment, therefore, is a special problem. Special programmes for the long-term unemployed (e.g. qualification programmes), financial support for companies willing to employ them, as well as various measures to prevent long-term unemployment, before it grows, are implemented to address the problem.

Innovative Behaviour of Companies

Notwithstanding the above difficulties, a very positive sign is the improvement of company-based innovation activities in Graz. These activities have been increasing since the beginning of the 1990s. The trend to establish more high-tech companies, however, will not be able to compensate totally for job losses in the problem-sectors, even though it may moderate the trend.

In summary the "SWOT" profile of the Graz area is outlined in the following table.

Strengths	Weaknesses
• Very good qualification structure in Graz with a high percentage of academics • High level of technical know-how • Large number of educational/training and research institutions • Various pilot projects and initiatives in the field of transfer, qualification and innovation • Willingness of the companies to co-operate • Increasing innovation activities in companies	• Decreasing population in Graz, high rate of commuters • High percentage of long-term unemployment • Structural unemployment – lack of specific qualifications demanded by companies • Poor transparency with regards to projects and initiatives – unused synergies • Lack of coordination between goals, strategies and instruments • Limited co-operation with R&D institutions
Threats	**Opportunities**
• Job losses in the low-tech industry – further increase in unemployment rate • Declining company development • Increase in the percentage of older people • Lack of strategic focus of pilot projects – impression of "showmanship"	• Job promotion in the service industries • Networking among single projects and initiatives to use synergies and to increase information flow • Establishment of competence networks (used as instruments for regional development) • Efficient use of resources (human and technical resources, innovation potential of SMEs) • Promotion of strategy-oriented co-operation • Promotion of regional diversification

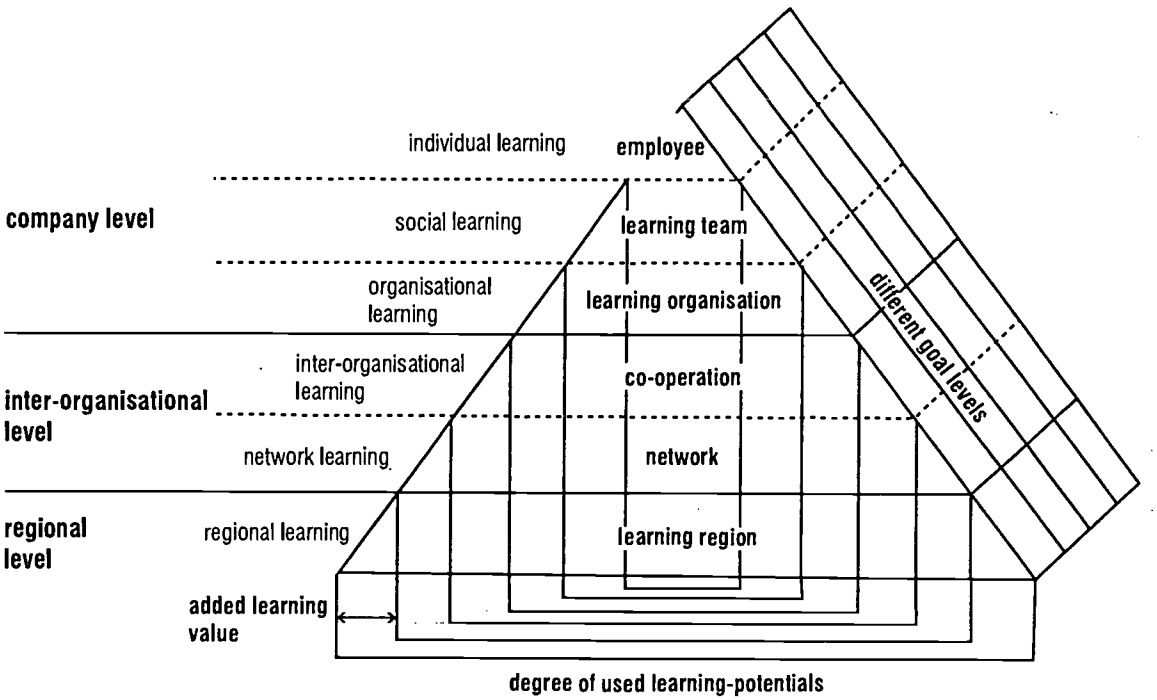
Basic concept of the project "Learning Region Graz"

The starting point for the project "Learning Region Graz" was the development of a basic concept based on systems theory (cf. Luhmann 1971, 1994 or Willke 1987, 1993). The latter theory is seen as a suitable frame of reference to fulfil the prerequisites for a paradigm shift towards a management perspective capable of dealing with complexity and dynamics. It also allows one to combine different approaches (bottom-up and top-down) simultaneously. This means that problems can be analysed from a regional point of view (top-down) and from an individual company's point of view (bottom-up).

By analogy with the systems theory point of view, different learning theories form reference points for each sub-system: individual learning at the employee level, social learning in learning-teams, organizational learning at the company level, inter-organizational learning at the co-operation level, network learning in networks and regional learning at the regional level (Scheff/Gary 1997).

It must be kept in mind that inter-organisational, network and regional learning represent areas, which apart from some exceptions, have hardly been discussed in research so far (see Hill 1994:41; Prange, Probst, Rüling 1996:15).

Figure 1: The Learning Pyramid



A company, for example, may work on a relevant problem at different levels of the pyramid and exploit different learning potentials e.g. product innovations may be developed by a single employee in a company, but they could also be the task of a project team. Depending on how many levels a company learns, learning processes themselves will vary in their efficiency and effectiveness. In the project, this concept is implemented at several (learning) levels (network, inter-organizational, company and employee level) from a strategic as well as from an operational point of view.

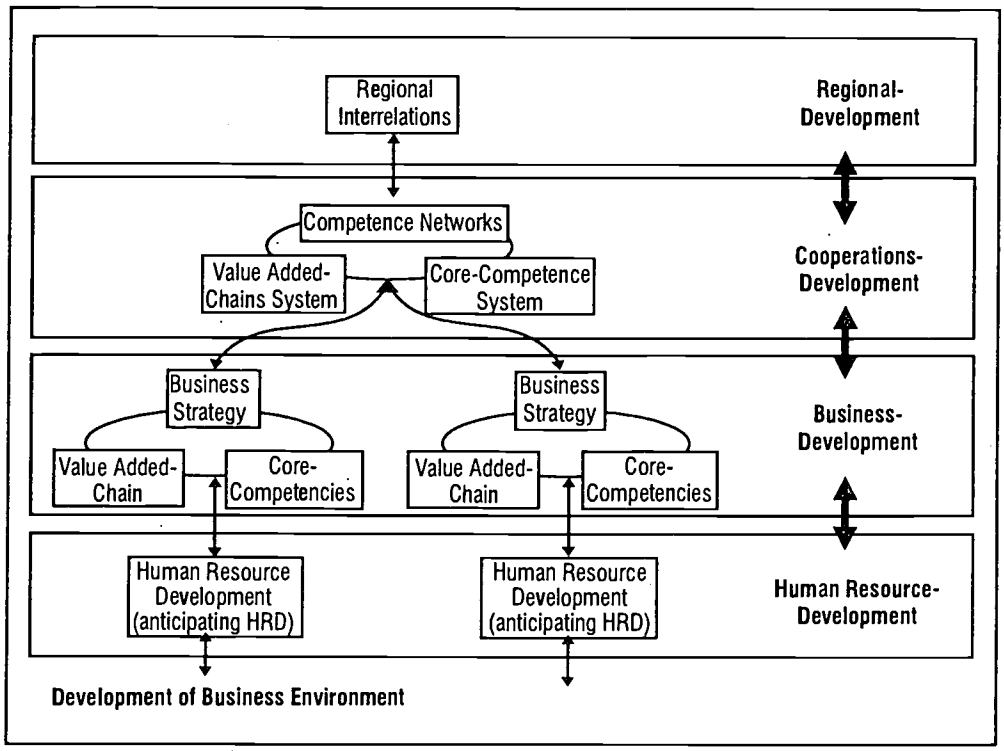
Degree of Innovation in the Project

From Human Resource Development to Regional Development

One of the main innovative aspects of the project is the demonstration of the interrelation between the different factors of human resource development, inter-company co-operation and regional development.

The human resource development function is defined in a new way and it takes on the task of detecting changes in the business environment and adapting a company's core-competencies and the competencies of employees to those changes (cf. Scheff 1997a). At the network level these competencies form a value-added-chain system, giving the companies a strategic profile and positioning them as competence centres.

Figure 2: Interrelation between Human Resource Development, Inter-Company Cooperation and Regional Development



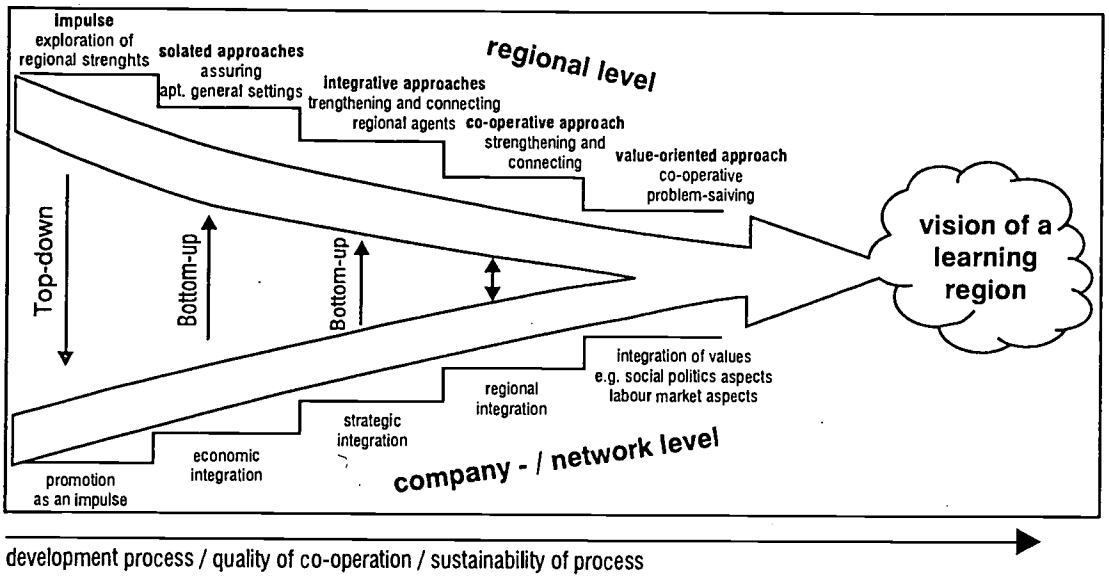
The combining of regional economic goals with specific company goals represents another innovative aspect within the project. The company networks promote regional development by coordinating the activities of regional institutions/agents and companies and thus supporting the development of the whole region.

Innovative Forms of Networking: Competence Networks – Beyond Company Networks and Clusters

The capacity to examine the strategic positioning of the company on the one hand, and to promote employee qualifications on the other hand through networks, has already been mentioned. In this regard, a lot of interesting initiatives (most of them still in the evaluation phase) have been introduced in the province of Styria, in which the cluster approach is favoured (see Porter 1990). The successful use of the cluster idea in this project, as an instrument to increase regional competitiveness, is based on the integration of two different ways of looking at a region – the macroeconomic top-down and microeconomic bottom-up approaches.

A competence-network approach has also been developed within this project. Competence networks are company-based, regionally integrated networks which bring together the competencies in a valued-added chain system in order to gain competitive advantages for all participants (companies, networks, regional agents). Competence networks are based on the exploitation of regional synergies.

Figure 3: Competence networks – main elements of a learning region



An important characteristic of the implementation of competence networks is the combination of the top-down and bottom-up approaches and the planning of appropriate interventions at different levels (e.g. what is to be done at the regional level and what at the company level) The content of the intervention and the intervention techniques have also to be taken into account in these complex systems, calling for a high degree of self-management (see. Bierfelder 1991, Kirsch 1992, Knyphausen 1991, Probst 1987). This also requires a highly competent networker or project manager with competence in the area of process-management.

Based on the initial network foundation tasks, during which roles, tasks, structures and strategic perspectives are agreed by all of the companies (with the involvement of employees) discussions between the regional agents, training consultants and research institutions and companies can become intensified. This is only possible, however, if the quality of co-operation between the companies is good.

Implementation of the "Graz Learning Region" Project

The competence-network approach can be illustrated through the example of the "Construction" network (industrial plant engineering and construction). The starting point for the development of this network was the analysis of the potential of the construction industry and the drawing up of a scenario to use this potential to achieve regional goals. This was done jointly with regional agents and institutions. Based on the results, exploratory meetings with companies were organized to find out their expectations[12] towards a "Construction" network and to work out possible ways of co-operation. This task was undertaken jointly by the project promoter and the companies whereas the management of the whole process was carried out by the project promoter. The market

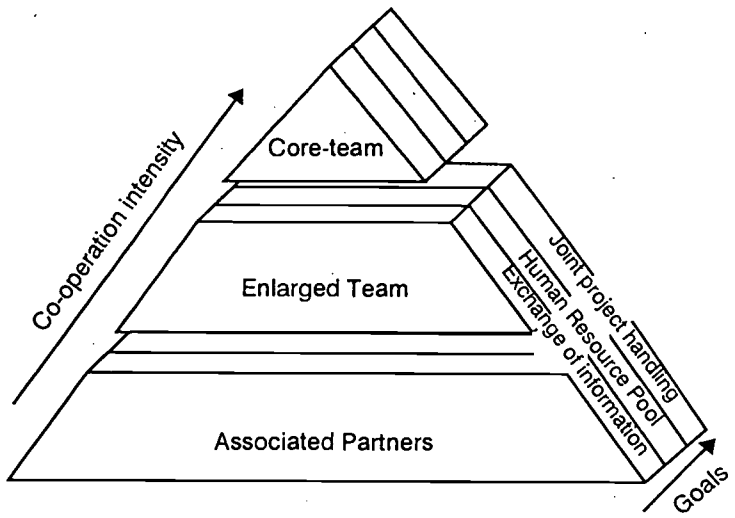
[12] The expectations vary in relation to information and know-how exchange, establishment of joint distribution and market development, joint human resource-pool or joint project-handling.

analysis was carried out jointly by the companies and the promoter. This was very important especially with regards to clarifying the goal of the "Construction" network.[13] .

A value-added chain[14] was worked out to develop the competition profile of the "construction" industry. The participating companies positioned themselves in this value-added chain according to their current business activities. A detailed *business and market analysis* (including a SWOT analysis) was carried out in each company.

Regarding the intensity of the co-operation, two sub-systems evolved in the "Construction" network which can be described as a "flexible and dynamic co-operation-model" (cf. Scheff 1997a). This model combines several co-operation structures and offers potential co-operation partners the possibility to participate in a flexible way, depending on their needs.

Figure 4: Dynamic Co-operation Model



One dimension of the pyramid (outlined above) is the "intensity of the co-operation", which means that companies work together more closely as core-team partners than just as associated partners. The second dimension of the pyramid consists of different co-operation fields e.g. information/knowledge exchange, development of a joint human resource pool and joint project handling[15]. Goals vary depending on the degree of co-operation. This means, for example, that the inter-company information and knowledge exchange is organized as an informal information exchange with the associated partners, while a formal experience-exchange and knowledge-transfer meetings take place only with the core teams.

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[13] All companies involved are confronted by extremely differing rates of capacity utilization, not well developed distribution structures for world-wide project acquisition and a more or less weak capital base. Besides that, the companies don't have the financial and personnel resources to handle large projects because of their small-company-structure.

[14] The classification of each company within this value added chain allows a first identification of horizontal and vertical co-operation possibilities.

[15] These areas have been listed as potential co-operation fields by the participating companies of the "construction" network and show how complex the motives for co-operation are.

This "dynamic (and flexible) co-operation model" offers the possibility for each company to classify itself according to its individual potential, and on that basis decide about its co-operation intensity and the goals and fields to be addressed. Furthermore this model is a "live system" which means that it is open to new participants, thus offering a range of possibilities. The core team of the "construction" network is a quasi "virtual company", a legal entity (with a joint company name and joint management) but very flexible (with all participating companies still doing business on their own). The company is open towards new co-operation partners and presents itself as a living changeable system. So far 12 companies hold shares in this private limited company.

The enlarged team, on the other hand, comprising 30 companies, is characterized by temporary collaboration. At the beginning of the development process, short-term economic goals were the centre of interest but these goals later became more strategic. The intensification in the networks is therefore very important. One way of achieving this, for example, is the active integration of multipliers (from different hierarchical levels in the companies) in the network development process. In this respect, the establishment of a human resource pool in the construction industry can be seen as an example. The companies can assist in the provision of workers for this pool. The integration of the long-term unemployed (demonstrating personal qualifications) with those in the construction industry (manifesting specific occupational know-how) assures a balance in the realisation of social and labour market goals.

Parallel to the company sectoral level, a network has also been established at the regional level. The main goal of this network is to discuss regional problems in the Graz area on a very broad basis and to work out concrete solutions. The members of this network comprise representatives of the chamber of labour, the public employment service, Büro für Ausbildungs und Beschäftigtenentwicklung (regional support service dealing with training and employee development), training, consulting and research institutions, the federal industry association and the chamber of commerce. This regional platform promotes inter-disciplinary approaches to problem-solving.

Conclusion

In starting this project, it was intended that all activities and measures would be sustainable, becoming permanent when the project was over. When defining the goals and developing the project approach, an integrative view of qualification and company development was used, placing them in a long-term regional development context. However, it is not only the economically valuable effects that are the centre of interest. This concept of sustainability, although based on economic principles, is not evaluated solely in monetary terms. The combination of the top-down and the bottom-up approach in the development process, with special attention being paid to joint problem-oriented learning approaches should help to assure the long-term sustainability of the development process, thus guaranteeing benefits for everybody.

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CHAPTER 10

Regional Development and Learning: Case Studies in Southern Sweden

Bernd Hofmaier

The word *region* appears frequently in discussions today. In that connection, one also comes across the term *learning region*. On the national level many politicians see *the regional approach* as a solution to a variety of pressing problems. On the EU level, regions have a new status between the national state and the EU. It is also fair to say that the concept of region contains a number of vague notions which regional political parties attempt to exploit. The question is, whether the *learning region* is merely a fashionable term – both for politicians and researchers – or is it a useful and productive concept that can be used not only to describe regional development, but also to guide practice. This contribution puts forward some reflections on the concept of *learning region* as well as providing some examples of how aspects of the concept have been implemented in reality.

Some points of departure

Previously, when regions were discussed, the emphasis was usually on the region as a political unit and often with emphasis on cultural elements. In a way, this situation is still true as illustrated by the emergence of regional-oriented political parties. But more recently another element has emerged – namely the notion that regions can be seen as *innovation systems* (Lundvall, 1992). In characterising a region as an innovation system, one is referring to the modes of interaction between knowledge producers, disseminators and users. This structure is characterised by extensive interaction and iterative communication. Exchange is normally done more or less informally, but can also be "organised" according to a certain methodology. Such a perspective opens up different tracks of development. Generally, studies of successful regions show that their success depends not only on the presence of influential institutions but also on the ways in which these institutions interact with other actors in the region. Amin and Thrift (1994) talk about "institutional thickness" and Putnam (1993) uses the term "social capital". Even if these concepts have different origins, both focus on issues such as, trust, norms and network relations that facilitate joint actions. Both concepts characterise interactions which can lead to coalition structures resulting in collective representations of interests, and mutual recognition of a common purpose. The key themes according to this view are *interaction* and *communication*.

Both of these themes are central not only to discussions about regional development, but are also prominent in discussions about enterprise development. Traditionally, to support development work in companies, e. g. implementation of new work systems and other organisational development activities – the unit of change was usually seen as the

individual company or part of a company. Learning was seen as individual learning, and in the best of cases organisational learning in a limited perspective. This mainstream thinking could also be found in Sweden, even if the institutional framework with long lasting co-determination arrangements and close social relations, created a more favourable ground for new developments in certain companies. The now closed Volvo plants in Kalmar and Uddevalla are good examples (Sandberg, 1995).

New ideas about how to support companies in their development efforts came from the programme "Leadership, Organisation and Co-Determination" (LOM programme) run by the Swedish Work Environment Fund between 1985 and 1990. The LOM programme's development model was characterised by:

- a praxis ("democratic dialogue") based on a theory of communicative competence;
- a conference methodology taking several forms such as search conferences, start conferences, and follow-up conferences where experiences were discussed and findings disseminated ;
- a radical process orientation;
- clusters and networks consisting of enterprises and academic institutions.

The ideas behind the programme, which in reality, were quite simple are summarised in the evaluation report of the LOM programme (Naschold et al 1993, p 9):

"The dominant, traditional model of organisational development, based on an instrumental-rational orientation to action, is appropriate to solving problems at a low level of complexity (optimisation strategies) in a stable environment. The LOM development model, in contrast, is designed to cope with complex problems, in particular self-reflexive transformation processes within organisations facing a "turbulent" environment. In the present context of a turbulent global economy a linguistically complex, communicative infrastructure is the necessary precondition for instrumental-rational action, in particular for radical processes of self-transformation."

The evaluation confirmed that interaction and communication were important parts of enterprises' development activities. Even if the LOM programme demonstrated the appropriateness of certain measures like conference methodologies which helped start development processes and facilitate learning between companies, there were certain drawbacks. Among these were difficulties in implementing the collectively created ideas in the individual companies and in organising learning and development processes there.

The Swedish Work Life Fund and its Activities

Another development, with focus on learning and inter-organisational learning, can be found in the activities of the Swedish Work Life Fund which were carried out between 1990 and 1995. In the late 1980s the Swedish government decided to withdraw (some people have said "to confiscate") a certain amount of money from companies, in the form of a special environment tax, in order to counteract inflationary tendencies in the Swedish economy. It was decided to put back about 15 billion Swedish crowns into companies in the form of a support for development. Companies and bodies in the public sector had to apply to a special body, called the *Work Life Fund*, putting forward an improvement or

development plan. This action plan had to focus on three integrated topics – work environment, work organisation and rehabilitation. Altogether, 25,000 projects were established, most of them in SMEs. Without going into depth regarding the results – the interested reader is referred to the evaluation of the Fund made by the author and others (Gustavsen et al 1996) – there are several issues worth noting. The Fund was not only a provider of money, but also a synthesiser (and clearing house) of tendencies emerging in Swedish companies and institutions in the public sector. Through its decentralised policy the Fund favoured a regional approach. By means of its facilitating activities, direct contacts could be made leading to continuous dialogue between different actors in a region. These dialogues or discussions emanated from the problems of the users and were not merely based on general theoretical principles about "good" work organisation.

By demanding integrated workplace programmes, the Fund stimulated companies to organise a thorough development process. Even if the Fund, from the beginning, focused on individual companies and their development programmes, after some time the direction changed, and at the end of the five-year period the Fund supported several networks of enterprises. The evaluation showed an interesting picture of many enterprises who introduced and maintained development work. In general it consisted of actions in which all people in the companies participated – discussing strategic questions, company targets and other topics leading to a jointly agreed framework for development projects – combined with organisational arrangements where experts carried out development work with people on the shop floor.

Different configurations were found underlying the development process, most of them (in particular in the occupational health services) following rather traditional ways of dealing with development processes, such as *expert driven* change processes. But many companies adopted, what can be called *conceptual driven* change. This way of dealing with development processes is built on concepts or ideas (in other circles often related to business process re-engineering) but in the context of the Work Life Fund, these were related to the established tradition of co-determination and co-operation in Scandinavian working life. Concept-driven processes entail that ideas are developed through broad dialogues within the organisation – and sometimes together with external actors. The evaluation showed that many of the more successful enterprises and public institutions used concept-driven development processes and put a relatively large amount of resources (both financial and personnel) into the development process. This gave them the opportunity to work in a parallel fashion on several issues, dealing with all levels and functions in the organisation. Thus, in many cases the whole organisation was involved in the change process and companies were able to mobilise all their employees. This way of organising development activities can be described as a *development organisation* process, which entails:

- an extensive use of project-based work with groups and project leaders;
- a substantial investment in training programmes supporting the development of work organisation;
- the establishment of development activities like workplace meetings, task groups, visits to suppliers, feedback sessions;

- an overall co-ordination service provided by means of information and discussion arenas and often taking the form of workplace meetings or general meetings.

As a result of this work it was realised that the unit of change can no longer be seen as the individual enterprise, but rather the *network,* consisting of enterprises and other bodies in a region, should be the centre of focus. In a report about different network strategies, these ideas are applied to the development of *productive structures* in a region (Gustavsen & Hofmaier, 1997). This means that enterprises and other organisations, embarking on a development process, start from definite, central problems or tasks seen in relation to a specific context. Problems, which the enterprises experience, are normally multi-dimensional and can be discussed and solved in many ways. According to our experience there is seldom a single or one-dimensional solution but one has to work multi-dimensionally. To do this, enterprises need a *strategy*. Strategy is not seen as a matter for a few actors within an enterprise or a region. Strategies are formed through broad dialogues with a cross-section of all of the actors. These strategies can be discussed and designed in different arenas like periodical "strategy forums" or other discussion forums. The next step is to transform strategy into actions. This can be done through building a *development organisation*. Such a way of organising development work can be done in an individual firm but also between enterprises in the form of a network.

Normally there is need for professional support. The idea is that enterprises look for support by means of exchanges with other companies and organisations in the region. In this respect, the regional university plays an important role, not as a detached expert but as a partner in a joint process of knowledge creation. In this sense, regional universities or other regional bodies can act as relay stations or as intermediaries for the supply of expert knowledge. The theoretical principles underpinning the regional network examples described below, can be described as follows:

- development activities are characterised by interaction and communication, which means that they can be seen as a form of social construction;
- the focus of development activities moves from the individual enterprise to the network;
- enterprises and public organisations in a region are seen as different elements in an overall regional network structure e. g. universities, providers of training courses, and other organisations which support enterprises.

Some Examples from the Region of Halland

The county of Halland is located on the west coast of Sweden with a southern border with Scania (Malmö) and a northern one with Bohuslän (Göteborg). The county has six municipalities and a population of 270,000, Halmstad being the largest city with about 85,000 inhabitants. The economy is based mainly on agriculture, manufacturing (mostly SMEs), tourism and the public service sector (health care and social work). There are a few larger companies in the county, among them a nuclear power station, a large pulp mill, an important paper mill and a glass manufacturer. In terms of jobs, the three dominating branches are manufacturing, trade, transport and communication, health care and social work. The rate of unemployment is below average compared to the country as a whole. An important step in the development of the region was the opening of a regional university in

Halmstad in 1984. With about 5,000 students following engineering, social sciences, humanities and health sciences courses, the university is now an important player in the region, especially as, from the start, it focused on the needs of enterprises and local authorities. One example is the study programme for development engineers, in which students are working on different projects together with local companies, mainly SMEs. Since 1988, one of the R&D units at the university, the *Centre for Working Life Research and Development* (CAU) has been acting as a resource centre for the region, initiating development processes in companies both in the private and the public sector. Financial support for these activities comes from the university itself but also from other funding programmes such as the LOM programme already mentioned. CAU is part of the university's learning structure and is both organizing and participating in learning events at the university itself and in the region. CAU, for example, is the initiator of a three-year study programme in Work Science which focuses on development processes in and between enterprises. One of the main R&D activities of CAU today is that of initiating, supporting and studying processes in networks of enterprises. Three such initiatives – one dealing with SMEs in the manufacturing sector, another relating to women entrepreneurs, and the third concerning the public sector – are presented below. These networks are partly financed by the EU European Social Fund (ESF) and are included in the BOOTSTRAP project, within the EU ADAPT initiative. The Swedish Council for Working Life Research and other bodies will finance a further initiative focusing on a new SME network. Other sponsors are the Swedish Foundation for Knowledge and Competence Development (KK-Stiftelsen) and the Swedish National Board for Industrial and Technical Development (NUTEK).

Network Case Studies

The lessons learnt from these experiences are clear. To help enterprises initiate and organize a development process, it is essential that a sufficient number of enterprises in a region firstly embark on a joint development process in which problems, targets and measures are discussed. Such a *development organisation* can be used both for the development of individual companies as well as for development in regional based networks. It is not considered appropriate, therefore, to offer programmes on an individual basis to firms, especially with regard to SMEs. The main point is that the SMEs have to join in a *development dialogue*. By this, we mean continuous dialogue between enterprises about problems and targets, development activities, the formulation of action plans and the evaluation of actions taken. The organisation of this dialogue should result in a momentum for development processes in each of the individual firms.

CAU and affiliated researchers conducted several development projects in the region for SMEs in the manufacturing area (the first of the networks mentioned above). In the main, the organisation of the projects followed a similar structure. First, several *search conferences,* at which management and employees from different companies could meet, were organised. Such conferences were based on the experiments of Merrelyn and Fred Emery (and others) who developed this technique as a participative approach to planned change, which engages the collective creativity of people. It challenges participants to find common ground around new strategies, future directions and joint actions (Emery &

Purser, 1996). (Such conferences – with some modifications – were also the main techniques used in the LOM programme mentioned above). Following discussions on a strategic topic at these search conferences, the participants agreed to organize certain tasks and development work relating, for example, to the reorganisation of work or the introduction of information technology. In this first part of the process, both employees from other companies and external experts participated.

During this stage of the programme, one of the companies, which had had bad experiences earlier when trying to reorganise itself into semi-autonomous work groups, found that the above discussion method enabled it to make a breakthrough. Because this discussion resulted in the strong commitment of the employees, the implementation was very successful. Other companies in the network, which also hesitated earlier to reform their organisations, were now able to start such a reorganisation project. These dialogues also resulted in a more focused discussion on the relevance and use of information technology (IT) and, in particular, possibilities offered by the Internet, which resulted in a joint strategy for IT (the implementation of different IT tools such as Homepages, Internet servers, and e-mail connections). Other "projects" resulting from these meetings were programmes to improve the work environment in accordance with current legislation (the Swedish Work Environment Act) and to make a start towards meeting the standards of ISO 14000. Another project of a participant company was the re-examination of its marketing strategy. Yet another example is the so-called PRYO project, where employees from different companies visited other companies for a day, in order to learn how "other companies" carried out their work. At present, six different but interdependent networks are unfolding simultaneously. In addition to the two individual networks and a "network of networks", four new collaborative structures are being developed which are all based on ideas generated one way or the other through the initiative. If this development continues, a new infrastructure linking small enterprises to each other, as well as to their communities, will emerge. These different initiatives constitute a potential pattern of evolving connections, a socio-economic "warp and weft", which could be a step towards a new regional infrastructure (Lundberg & Tell, 1998).

The network of women entrepreneurs started from a different basis. It consists of ten so-called micro-enterprises, owned by women and based mainly in the rural countryside of Halland. The idea in nearly all cases is to develop a part-time business activity with the focus on tourism. Examples of activities are horse riding, camping, and the management of shops where farm products are sold. Due to the inexperience and the relative isolation of the women, the need of support from other women in the same situation was seen as appropriate. It is interesting to note here that providers of training had offered assistance several times in the past, but standard courses in business administration or IT did not meet the demands of these women. Instead, this network development began by organizing meetings where the participants had discussions about strategy and targets. Through these meetings clear demands regarding training were made. The network also functioned as a support structure – to a much larger degree than in the SME network – giving the women the courage to continue. So far, the results seem to be good. All participants in the network have constructed their own web sites, have organised several training courses on IT and small business administration. The group also presented their

activities at a tourist fair in Germany. Through their local embeddedness, the network activities are now expanding and other regional actors are involved.

The third network in the public sector is different from the other two. It has to be seen in relation to existing bureaucratic organisation forms which are normal in the public sector. In order to be more efficient, the municipality is attempting to promote new activities where various forms of network relations are encouraged. CAU organised different forms of search conferences and other meetings in which different groups set out to learn from each other – a fire brigade, a harbour administration and a local school administration. A common project now being organised is the rehabilitation of people with work injuries or suffering from other health problems. This is being carried out across the borders of different authorities (Ljungberg-van Beinum, 1997).

As a kind of umbrella project, the EU ADAPT project BOOTSTRAP is facilitating the transfer of learning between the different networks. There are four priority objectives within the Swedish BOOTSTRAP-project: adapting SMEs to the international market; development of management capacities; innovation and technology (IT) transfer; and organisational and competence development. The main activities consist in bringing companies together in conferences and seminars; organising needs analysis; supporting and organising training modules and training activities in IT; and supporting SMEs and public companies in the organisation of their own development activities.

Lessons to be learnt from these examples

There seems to be a fair consensus about the importance of a regional approach for economic development. Even if there are different models for regional development, there is broad agreement about the characteristics of a successful region. "Institutional thickness", "agglomeration economies", networking and supportive institutions, trust and "social capital" are seen as important ingredients. Other concepts can be useful to describe regions. In systems theory, two principles are contrasted – *redundancy of parts* and *redundancy of functions*. These concepts have also been used in social theory and especially organisational theory. Bureaucracy is put forward as the ideal demonstration of the principle of redundancy of parts and the semi-autonomous group the ideal type illustrating redundancy of functions (Beinum, 1988). To these two principles can be added a third one which can be called *structural redundancy* or *redundancy of relations*. (Grabher, 1994, p 28). The point here is that the security of functions in a system is maintained through a great number of relations which bind units in a system together. If disturbances are emerging they are not hurting the whole system, they can be spread throughout different subsystems where they are handled. In other words, if for instance, the market demands change, enterprises in a region with a great number of relations to different organisations are not as vulnerable as those which have only a limited number of relations to other organisations. In this perspective, a prerequisite for regional development – or perhaps also the result of this process – is a network of multiple relations between units in a region. These units can be enterprises, regional authorities, regional administrations, R&D institutions and other training institutions. We can easily see the importance of this principle, for example, in the Italian so-called "industrial districts", the German region of Baden-Württemberg, the Swedish region of Småland and others,

which are all characterised by networks. The implementation of a redundancy of relations approach requires "meeting places" where continuous and informal contacts can be made. Putnam gives a vivid picture of the different meeting places in the Italian industrial districts, such as the church, the piazza, the café, sport associations and the Sunday ritual at the football stadium (Putnam, 1992).

In promoting such relations one is fostering the concept of a learning region. The characteristics of a learning region could be as follows: an economy where the success of individuals, firms and regions is related to their ability to learn; where learning means the building of competencies and not just an increased access to information; where learning takes place in all parts of society, not just in high-tech sectors; and where net job creation is taking place in knowledge intensive sectors (Lundvall and Johnson, 1994). Such a view is close to another modern concept, that of *knowledge creation*, which is used to describe processes in individual companies and some other contexts (Nonaka & Takeuchi, 1995). In the knowledge creation process different kinds of knowledge can be identified. Universities and other formal learning institutions can be seen as representing *know what* and *why*. Enterprises and workplaces, in both the private and public sector, represent *know how* and *who*. This mainly refers to practical learning – resulting to a great extent in *tacit knowledge* – which is derived from social interactions with customers, sub-contractors, financing institutes and other agencies.

In regions with close relations, another form of knowledge emerges, which we can define as *network knowledge*. This form of knowledge is neither private nor public. It depends on trust and not the market and can be characterised as a process embedded in a mutual "give and take" in the context of a joint history but influenced by, what Axelrod calls "the shadow of the future" (Axelrod 1984). In other words, *network knowledge* is the result of reciprocal relations, based on expectations and fulfilment and founded on trust. "Network knowledge" refers not only to the skills of individuals but the transfer of knowledge from one group to another, so it is highly dependent on interpersonal relations. Florida (1995) argues that "regions must adopt the principles of knowledge creation and continuous learning: they must in effect become *knowledge-creating* or *learning regions*".

In the regional development examples discussed above, the term "network" is used a lot, but we ask if "network" is the most appropriate term for this type of relations. "Network" is a common term, used by everybody and, therefore, risks being empty and no longer useful. Perhaps we should focus more on the kind of relationships between companies and other organisations in a region. The relations described above are relationships where knowledge can be created – in other words, learning relations. Therefore, we would prefer the term *development coalition,* which seems to be more appropriate for relations between individual enterprises and various other support agencies such as universities (see Ennals & Gustavsen, forthcoming). Even if "network" is still a useful concept, perhaps the relations between enterprises and the support structures in a region (public authorities, universities and various other agencies) could better be called *productive structures.*

Conclusion

It is clear that the development strategy discussed above is a long-term process. The kind of regional programmes outlined demand long-term support – both in terms of finance and personnel – and they require a new view of the interplay between enterprise development and regional development. The strategy discussed above has mainly a bottom-up orientation, which is often in conflict with the centralised, regulated top-down approach favoured by public authorities. Such a centralised approach – which has been common in Sweden – also often includes a "conceptual domination" – where experts in public authorities offer their own expert-oriented view that does not allow for local participation. During the last years, however, we have seen many improvements in Sweden, where public authorities support and promote development coalitions.

Another important part of the regional learning strategy, discussed above, is the role of regional universities. While playing an active part in the region, through co-operating with enterprises, universities are also the gateway to the academic world. Most SMEs have problems in approaching universities In this respect, many new intermediary structures, such as liaison offices, forming "bridges" between R&D units and SMEs, have been set up. Some of these appear to be successful, but many problems remain. One of these relates to the structure of the educational system as such. This analysis was the starting point for the Swedish government to reform higher education, especially regarding the role of the universities. Several government studies identified what has been called the *third task* for higher education organisations. This means that besides carrying out the classical tasks of teaching and research, higher education institutions should also interact closely with the public. This entails not only providing information to the public about the results of R&D – which was in a way the traditional third task for universities, but also in appropriate cases to undertake teaching and carry out R&D tasks together with the so called "users". The consequences of this policy is that higher education institutions have to find new ways for teaching and conducting R&D. The study programme "development engineers", mentioned above, is an example of how such a policy could be implemented. The graduates of this type of programme will not just be experts but also be able to play an *intermediary* role between different knowledge cultures and thus become active and critical participants in organisational renewal processes.

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CHAPTER 11

Learning from Disequilibrium – the Case of Boston, Massachusetts

Rosalind Greenstein and Jemeline Robertson

Introduction

The Boston Metropolitan Region derives its considerable strengths from the attributes that allow it to compete successfully in a highly competitive economy. At the precipice of the 21st century that means a depth and breadth to its high-technology and knowledge intensive labor force. The Region's most profitable firms are able to recruit workers from the top reaches of some of the world's best institutions of higher education. A number of the characteristics that distinguish learning regions from other regions – for example the concentration of establishments that demonstrate their ability to share resources and enter into temporary collaborations – are practiced, as a matter of course, by academics in the region's numerous universities and colleges in both academic and industry collaborations.

In contrast to a relatively collaborative style in some corners of private industry and academia, the region's public sector is strikingly segmented. In general, New England's municipal government is highly fragmented; this inhibits state and local government from playing a particularly strong role in fostering a culture of networking both within and between governmental units on the one hand and between state and local government and the private sector on the other. However, there are modest indications of an increasingly collaborative style in the public sector. Federal transportation funding now creates structures for collaboration on infrastructure planning and development. While minimal master planning mechanisms exist for transportation infrastructure, no such mechanism exists for the provision of educational services. Moreover, it is ironic that in a region with such riches when it comes to colleges and universities, the Boston Region shows great unevenness in quality and access to formal education, from pre-school to post-graduate.

There are certainly institutional and structural barriers that limit the region's clear-cut identification as a proto-type for a learning region, however, the seeds are present. In fact, Boston's current industrial landscape and the potential it holds for the future are very much rooted in its past. The combination of a cluster of industries for which the region holds a competitive advantage, linkages among and between industries, and the capacity for adaptation and reinvention, have all been present at earlier stages in the region's political economy. Consequently, though the benefits of integration into the global economy are not without their costs, the region as a whole fares relatively better than many of its North American counterparts.

Boston's Economic Roots

A city's shape is largely formed by the supply and character of the land on which it sits, however, infrastructure development, communication technology, politics, and economic forces all exert influence on city form and character. It is not different for the Boston metropolitan region, whether one examines its early 18th century mercantilistic roots, its mid-19th century industrial base, or its late-20th century knowledge intensive network.

From its earliest days, Boston's port location limited expansion to the east. As demand for city locations outstripped supply, the land area was effectively increased in three ways. In real terms, developers were able to actually create more buildable sites by filling bays and leveling hills. Much of this land reclamation occurred between 1850 and 1900 with the more ambitious projects increasing land supply in the Back and South Bays. The physical size of the city also grew as Boston annexed the independent towns of Dorchester, Roxbury, Brighton, Charlestown, and West Roxbury in the 1870s and 1880s. Meanwhile, successive waves of transportation improvements which brought steam-powered railroads, electric trolleys, and the nation's first subway system increased accessibility to areas further out from the city center. By the 1890s the area of dense settlement had reached a six-mile radius from City Hall (Warner,1962).

While it is true that local forces such as politics, land supply, and infrastructure left indelible marks on Boston, the city was also shaped by larger economic and industrial forces. From its founding in 1630, Boston played an important commercial role for the developing nation despite competition from New York and Philadelphia. In comparison to these more southern colonial outposts, Boston was relatively isolated and less well-endowed with productive farm land in its hinterland.[16] However, its port and port-related activity did much to enrich the region. Spin-off activities included shipbuilding, rope and sail-making, warehousing and docking, re-export trade, brokering, insurance, and banking. It was these latter activities that were to play a significant role in facilitating the expansion of the region's burgeoning manufacturing sector (North, 1961).

In character with historic regional economic behavior, the economic success of one era was used to shape the economic fortunes and industrial landscape in the next. Facilitated by rail networks that connected Boston to its industrial cities, the interdependency between the city and its hinterlands grew and its position as the commercial center of New England was strengthened. The city supplied financial and legal services for production centers throughout the region and the capital needed to finance the growing industrial sector. It also provided forward links to vast and growing domestic consumer markets to the west and south. Perhaps more importantly to the economic health of the region's industrial base, however, were the backward linkages to the machine tool industry.

Also contributing to the growth of the industrial sector was the great influx of European immigrants who provided an ample supply of low-wage labor for the textile, shoe, and leather factories that dotted the landscape beyond Boston. At the end of the 19th century, Eastern Massachusetts had specialized manufacturing centers where groups of

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[16] The seeds of Massachusetts highly fragmented local government may be traced to this era. Conzen and Lewis report that "[t]he Massachusetts Bay Colony spread settlement inland by setting up highly independent 'towns' that, in the early stages, traded relatively little with Boston" (1976).

immigrants – and descendants of immigrants – tended to cluster. For example, immigrants from Southern Europe and French Canada worked in the shoe factories and mills in cities such as Lowell and Lawrence; Chinese laborers arrived from California to work on Boston's Pearl Street Telegraph Exchange; fisherman from Portugal and the Canadian Maritimes settled in New Bedford and Gloucester; Irish immigrants, and their descendants, worked in and around Boston's seaport, as well as in factories in Boston and surrounding towns such as Somerville, Cambridge, Charlestown, and Revere. Boston's upper class tended to be drawn from those who immigrated in the Colonial period and were now engaged in the legal and financial fields and resided in the affluent neighborhoods of Beacon Hill and the Back Bay.

Yet, changes that occurred beyond the region reverberated in Eastern Massachusetts. The population of the United States was moving west, so producers found that their markets had also shifted. Furthermore, infrastructure investments in New York State – in the form of canals and railroads – proved to limit Boston's western and southern expansion. Technological changes also had important effects. While cheap hydro-power once gave New England's mills and factories a competitive advantage, steam power increased the economically competitive production sites beyond river locations. If population movement to the west shifted the demand for the region's manufactured goods, the use of railroads for long-haul transport of Pennsylvania coal increased the feasible supply of locations for factory production. Meanwhile, the US South was faced with a labor surplus as technology increased farm productivity and lowered the demand for workers.

By the 1930s, New England's factory owners began to look for cheaper production sites. Three sets of forces came together: high costs in New England, technological changes, and the population shifts that moved markets leading to a drop in industrial production in Eastern Massachusetts and a subsequent increase in the rural South. During this period, the region's employment was dominated by old-line manufacturing, largely producing consumer goods (e.g., clothing, sugar and confectionery products and printing and publishing) for local consumption, and intermediate goods (i.e. machine tools) for the region's factories. The structural shift in demand for locally-produced goods combined with effects of the Great Depression created a sustained drop in orders for the region's manufacturers.

World War II generated the demand needed to lift these industries out of the depression, but more importantly for Boston's future, it also supplied a foothold to engineering, electronics, physics, and related fields. Connections that developed between the Massachusetts Institute of Technology (MIT) and the Washington, D.C. establishment during the pre-war period intensified when the US entered the war on December 8, 1941. Today, much of the Boston region's high-technology industry traces its origins to this turn of events.

Boston's Knowledge Economy Roots

Albert O. Hirschman (1958), in the context of developing countries, understood successful economic development as emerging out of the negative feedback from failed experiments.

Similarly, the economic history of the Boston metropolitan region is a story of successive waves of accomplishment built from the collapse of once-dominant industries. Indeed, this may be the quintessential element that characterizes Boston as a "learning region."[17] The accomplishments are not simply the result of Yankee ingenuity, thrift, and hard work. Rather, the region has long enjoyed the synergies that result when government, industry, and academia join forces.[18]

In 1865 the Massachusetts Institute of Technology opened its doors to its first students, a class of 15. MIT was born out of the vision of scientist and educator William Barton Rogers as the Industrial Revolution unfolded in a city with a network of colleges to train doctors, lawyers, and the clergy. The new technical school would break ground as it combined the rigors of higher education with the practical demands of science and industry. With federal funds,[19] support from the Commonwealth, and interest from the industrialists whose factories and mills were the destination of the students' "field visits," the seeds were sown for decades of public-private ventures, private wealth generation, and massive changes in the region's economic structure and industrial landscape.

While prior to World War II there was little federal money for basic research, ties between the US military and MIT were to have profound effects on the region's economic structure. Two important military projects were linked to MIT in the early days of this collaboration. The first occurred during World War II when the US military established the Radiation Laboratory at MIT to coordinate the development and production of magnetrons[20] for the British Royal Air Force. The production contract was subsequently granted to Raytheon, then a radio tube manufacturer, giving the company a tremendous advantage in the post-war period. The second project came about in the 1950s when the US Air Force established the Lincoln Laboratory as a non-profit facility, operated by MIT, to design and build a national air defense system. An electromagnetic computing machine, that is a computer, was at the heart of the project.

As a result of this collaboration between the US government, MIT, and private interests, the industrial makeup of the region as well as spatial development patterns were profoundly altered. For example, out of the seeds sown at Lincoln Laboratories grew the US minicomputer industry. In fact, some 50 companies were spun-off from Lincoln Labs alone during the 1950s and 1960s. Perhaps the most famous spin-off was Digital Equipment Corporation (DEC). Ken Olsen, its founder, was an MIT engineering graduate who worked at Lincoln Labs before going out on his own in 1957. Six years earlier, An

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[17] Economists are attracted to the logic and elegance of the market because, at its best, it provides signals to economic actors; these signals, in turn, shape behavior. Similarly, Hirschman saw that emerging economies would benefit enormously from engaging in projects that essentially provided "on-the-job training" to workers, managers, and administrators. This learning by doing allows for adjustments to mistakes. Thus, economic development was a process of social learning. Thomas Vietorisz and Bennett Harrison's (1973) seminal article on feedback loops builds on these ideas.

[18] See Rosegrant and Lampe (1992) for an excellent rendition of this story.

[19] Among the wealth of information in Rosegrant and Lampe is an excellent discussion of the federal Morrill Land Grant Act of 1862 that provided the states with land grants. The proceeds of the land grants were to be used to fund institutions of higher learning that would train farmers and other workers and "improve the learning of all 'industrial classes'" (1992, p. 39).

[20] The magnetron was the center of the newly invented radar systems that the British were using against the German bombers.

Wang started Wang Laboratories.[21] Wang played a significant role in attracting other high tech firms to the town of Lowell, and was thus one of the important elements in Lowell's shift from a depressed and abandoned textile town in the 1950s to a model of industrial revitalization in the 1980s.

A great deal of entrepreneurial activity was spawned by the demand created by the US military for goods produced by the advanced electronic and aerospace industries. Moreover, these producers repeatedly chose suburban locations for their organizations, creating clusters of high tech businesses and research centers on the periphery of the metropolitan area rather than in the central city. Take for example the US Air Force's location at Hanscom Field,[22] which straddles the suburban towns of Lexington, Bedford, and Concord and lies just beyond Route 128, Boston's inner-ring highway.[23] Located just outside the gates of Hanscom Air Force Base is Lincoln Labs; down the street from Lincoln Labs is Raytheon; and up the street a mile or two is MITRE Laboratories, another non-profit lab funded by the federal government.

A heavy dependence on defense spending continued in the region, but the de-escalation of the Vietnam War in the late 1960s, a cutback in funds for the space program, and the effects of the oil crisis in the first half of the 1970s led the region into a recession. Conditions worsened, with unemployment hitting double-digits in 1975, until the area's high technology sector took the lead in the recovery process. One estimate is that Massachusetts' high-tech employment increased by more than 30 per cent from 1975 to 1979, a pace that is twice as fast as the rate for the state's total employment.[24]

Social Consequences of Economic Development

As high-end electronics replaced more traditional manufacturing sectors, the way production was organized in the Boston metropolitan area also underwent a profound change. In product cycle terms, production for mass markets (e.g., the former General Motors plant in Framingham or the former Shraft's sugar refinery in Charlestown) was being replaced by new products for a more limited customer base (e.g., DEC's minicomputers or Raytheon's missile guidance systems). Fewer production employees were required under this new regime while the numbers of people employed in high-end business and financial services showed dramatic increases. In terms of spatial development, the firms largely responsible for new job growth were choosing locations

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[21] Wang did his advanced training in physics outside of MIT's immediate orbit; he was at Harvard's Computation Lab before going out on his own.

[22] In 1953 the US Air Force became the legal owner of Hanscom Field.

[23] Route 128, opened in 1951, was the nation's first limited-access circumferential highway and was intended to provide recreational access to Atlantic Ocean north and south of the City of Boston. This ring road arcs through the suburbs 10 miles outside of the city center and developed first into a high tech corridor. Subsequently, it became a jumping-off point for development that stretches out to Interstate 495, south to Rhode Island, and north to New Hampshire.

[24] Nancy S. Dorfman (in Lampe, 1988) uses a definition of high-technology that includes a variety of industries from computers to drugs, from guided missiles to household appliances. Despite the breadth of industries included in her definition, in 1979 almost 65% of Massachusetts' high-tech employment is accounted for by only five industries: electronic components and accessories; office computing and accounting machines; communications equipment; measuring and controlling instruments; and guided missiles and space vehicles.

beyond Boston's traditional core.[25] The central city did see some growth, primarily in service industry jobs, but in this sector as well the growth was proceeding at a far greater rate in the suburbs. Even as overall employment growth in the suburbs increased, manufacturing employment was declining everywhere.[26]

The result of this industrial transformation meant a slight increase in an already highly unequal income distribution.

Share of Aggregate Household Income in Boston Region By Income Strata

	1960	1990
Bottom 5%	0.6%	0.4%
Bottom 20%	5.8%	3.5%
Top 20%	47.7%	46.8%
Top 5%	17.4%	19.4%

Source: Data calculated from US Census Bureau

These structural economic changes occurred along with demographic changes. The increase of poverty has been disproportionately borne by new immigrants. This income inequality is also apparent when looking at segregation by class across the metropolitan area. In 1980, the median price of a single family residence showed significant variation by submarket within the metropolitan region.[27] The high-end sub-markets have always served as bedroom communities to neighboring industrial centers – forming a 'golden crescent' along Route 128. The low-end submarkets were the centers of the region's old industrial complexes and are scattered across Eastern Massachusetts and are part of industrial era Boston's hinterland.

If segregation roughly along class lines is visible by looking at differences *between* municipalities, to see segregation by race and ethnicity requires a closer examination of spatial patterns *within* the City of Boston itself. Historically, Boston has been a city highly segregated along these lines. For example, Irish immigrants and their descendants tended to cluster around South Boston while Italians would cluster in the North End. And, as was true in many of North America's cities, the Roxbury section of Boston saw successive waves of ethnic groups settle. In the early part of the century Russian and Eastern European Jews settled in Roxbury, but by the 1960s Roxbury would come to be known as Boston's Black neighborhood.

Since the 1970s Boston's immigrant population has increased rapidly with an influx from the Caribbean, Latin America, and Asia. In 1960, only 4 per cent of the region's population was of a racial or ethnic minority; by 1990 this number increased to 15 per cent, and there

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[25] New technology development continued to locate along Route 128, Boston's inner-ring circumferential highway. However, the most recent round of high-technology growth has extended to Interstate 495, Boston's outer-ring circumferential highway (Rosenberg, 1998).

[26] Manufacturing employment dropped by 8.5% over the 1980's (Torto and Wheaton, 1994).

[27] Data are for the Boston Metropolitan Statistical Area for the median price of existing single-family houses, 1982 to 1990 (Standard & Poor's DRI).

is evidence that the number continues to rise. This influx of new ethnic and racial minorities changed the face of Boston's neighborhoods. Data collected by the Boston Foundation (1993) shows that the effect of this immigration was quite uneven across the city. Some neighborhoods, including parts of downtown Boston, maintained their largely white identity. Other neighborhoods with significant minority populations, such as Roxbury, the South End, and Dorchester came to be dominated by these 'minorities.' With high-paid professionals bidding up the cost of housing, and with the elimination of rent control in the cities of Brookline and Cambridge in the mid-1990s (the last two municipalities in the Commonwealth to eliminate this income subsidy) the impoverished in the region are increasingly confined to sub-standard housing and crowding. And, in the Boston region, poverty is highly correlated with race and ethnicity.

Poverty Rates by Race and Ethnicity
City of Boston, 1989

Hispanic	46%
Black	23%
White	8%

Source: Data calculated from The Boston Foundation (1989)

Access to Quality Education

The aggregate result of this configuration of residential areas, employment centers, and population sectors across the metropolitan region has created a sorting in space by race, ethnicity and class. Along with this spatial sorting occurs an uneven distribution in quality of public services. Perhaps the area with the greatest potential to cause long-term damage to people, institutions, and the long-term sustainability of the region is the uneven quality of public schools.

For those either willing or able to opt out of the public school system, the private preparatory schools and colleges located in Boston and its immediate surroundings were established to provide elite training for its own elite in the English tradition. In fact, in 1636 – six years after the arrival of the Pilgrims at Plymouth Rock – Harvard University was founded "primarily to make certain that the children of the Founding Fathers, their grandchildren, and their heirs unto eternity remain proudly English in their cultural aspects and not revert to an un-English tradition of ignorance and frontier barbarism" (Brown, p.130). Over the years, other segments of Boston established their own schools, leaving a legacy of a high concentration of high quality colleges and universities, including Tufts University, Wellesley College, Boston College and Brandeis University. However, on the public side of the school ledger, consistent quality is less apparent, despite the attempts at education reform (Daley, 1998).

The United States' urban upheavals of the 1960s and the 1970s left indelible marks on the Boston City schools. By the 1970s, the federal courts decreed the spatial segregation within Boston's neighborhood-based public schools to be so egregiously unequal as to require remedy from the courts in the form of a court-imposed busing plan to achieve school integration; from integration it was assumed that equality of education and life

chances would follow. Children from the Irish sections of South Boston were bused to the Black sections of Roxbury in the hopes that the racial integration of the public schools would improve educational opportunities for all of the city's young people. Some unintended consequences occurred, however, while the hoped-for improvements in education appear to be elusive, at best. One consequence has been the decline of the 'neighborhood school' as an institution. At the same time, the movement of the white middle class to the suburbs increased. It is in many of these suburban towns where the Commonwealth's best public schools are located.[28] While many of the region's school-age children are underserved by public education,[29] the region has a significant network of well-respected primary and secondary private schools. Some, like Phillips Academy in Andover and Milton Academy date back at least two hundred years. Students who graduate from these elite secondary schools enter the nation's elite universities.[30]

Among the Commonwealth's most underserved public schools are those in the region's old industrial cities. While the case of the Lawrence public schools is perhaps one of the most extreme, it illustrates the vast educational chasm in the region. As is typical of the old industrial cities in Boston's hinterland, Lawrence lost population during the 1970s. But, even as the descendants of European immigrants left, Lawrence saw an increase of a new immigrant population, this time from Southeast Asia as well as from Puerto Rico and the Dominican Republic; by 1990, 40 per cent of the City's population was of Hispanic descent.[31]

Along with a drastic change in the ethnic composition of the City came a concomitant change in Lawrence's demographic profile. The school-age population swelled while industry left, resulting in an increased demand for school services and a declining tax base. In 1997, after a number of years of probation, Lawrence High School lost its accreditation by the New England Association of Schools and Colleges. This, coupled with newspaper reports of mismanagement and various reviews and audits of the school system, led Governor William Weld to appoint a "fact finding team". While their findings included the presence of low test scores and "excessively high drop-out rate," even more distressing to the fact finders was that the school district administration had "utterly failed" to recognize the "urgent need to improve the academic performance of their students" and to take purposeful action "to ensure that *all* of the District's students have the opportunity to experience academic success" (Addelson, et al, p. 13).

In parallel fashion, the quality of the region's network of higher education also varies greatly between its private and public institutions. Two-year state-supported colleges in Roxbury, Charlestown, Fall River, and other urban centers with large low-income

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[28] Indicators of school quality are indirect, at best. However, Case and Mayer (1995) use per capita school spending and average scores on assessment tests and find that these measures of high quality schools are highly correlated with the highest-priced suburbs.

[29] The Boston Foundation (1989) reported that 80% of Boston City's poor children attended public school in 1989, as compared to 54% of the City's 'non-poor' children. These enrollment rates vary by race and ethnic group: 55% of the City's poor white children are enrolled in the public schools; 83% of the City's poor Black children, and nearly 90% of Boston's poor Hispanic children.

[30] College matriculations for Milton and Andover are representative, with significant numbers of graduates going on to Harvard, Yale, Brown, Columbia, Stanford, Wesleyan, Princeton, Wellesley, Bryn Mawr, and other of the nation's most elite colleges and universities.

[31] US Census of Population.

populations, serve a variety of students. Older students who juggle work and family life, along with immigrants learning English, and high school graduates looking for a way to drastically reduce the high cost of a diploma from a four-year college, all are part of these diverse student bodies. With annual tuition over $2,500 – nearly twice the average cost at two-year colleges in the rest of the nation – there are proposals in the legislature to reduce or eliminate tuition (Chacon, 1997). If these proposals succeed, the Commonwealth's two-year colleges would follow the path of its four-year universities where tuition recently has been dropping. Even as student's costs fall, however, concerns about quality remain. Tuition reduction plans also include admission-tightening strategies. However, the substantial public sector commitment of funds meant to bring the quality of education in the Commonwealth's public colleges and universities up to par with its private schools is unlikely to materialize when politicians fight over the many ways to reduce taxes with current forecasts of budget surpluses.

Boston as a Learning Region

In order for a region to experience the benefits of a learning region, there must be a concentration of interdependent industries. A cluster of linked industries provides regions with at least two important advantages. First are the benefits of localization economies that accrue to firms from co-locating. For example, the concentration of high-technology firms in the region reduces employers labor recruitment costs and raises the average quality within the employee pool. Second, the existence of an industrial cluster composed of linked industries produces spin-off industries from the forward and backward linkages. An example from Boston's early history serves well.

Douglass North (1961) uses the case of the Boston Manufacturing Company textile mill in Waltham to illustrate this. Waltham-produced textiles were in competition with cloth produced at British mills as well as those in the South and West. However, in comparison with other domestic mills, the Waltham mill had a higher concentration of capital equipment. Boston Manufacturing was producing a coarse white cloth that could be used for a wide array of products, largely on the countless small farms scattered across the North American continent. The sewing machine only increased demand for the plain all-purpose Waltham-produced 'sheeting.' However, North argues that the backward linkages to the machine tool industry may have been even more important to the economic health of the region's industrial base that would flourish in the 1840s and be sustained through the early part of the next century.

Long-term economic wealth presupposes industries that are globally expanding. In industries that have new products, new process technologies or new product technologies, the demand for continual learning is extremely high. When the demand for *new* knowledge is based on *experience* (rather than codified and handed down in textbooks, for example) the need for informal, spontaneous, face-to-face interactions is central. This transfer of knowledge can occur both inside and outside of business establishments. When it occurs outside of firms, one looks to bars, restaurants, and other public gathering spots that facilitate this type of knowledge transfer. When it occurs inside of firms, one

looks to the organizational structure that best facilitates this knowledge transfer. It is what Rosabeth Moss Kanter (1983) calls the "parallel organization."[32]

Annalee Saxenian (1994, 1996) studied California's Silicon Valley and Boston's Route-128 during the 1980s and found that the cultural milieu that facilitates collaborative learning was far greater in California. At the time, the two regions produced similar products, yet the culture of Silicon Valley seemed to give it a competitive advantage. Flexible production processes, mutually beneficial and open industry-university collaborations, and public places for informal and spontaneous gatherings were the hallmarks of Silicon Valley's success.[33] Nonetheless, the Boston region's successes of that same period cannot be denied – indeed the "Massachusetts Miracle" was often looked to as a model for other regions and states to emulate.

From the mid-1970s through 1988, the region experienced tremendous growth primarily due to heavy defense spending and the growth of the minicomputer industry. During this period, the industry was characterized by firms that were vertically integrated – conducting research, manufacturing the product and its components, as well as performing the tasks of marketing, sales, and technical support. Although the Boston region has been long established as a major source of innovation, new products, and new industries, it has not traditionally been successful as a location for mature industry activities and this case proved no different[34] The large companies which dominated the industrial scene of the 1980s became inefficient and unable to adapt with the speed necessary in the rapidly changing technology sector. The increasing competition, changes in technology, and a decrease in federal contracts led the area into a decline. The boom years ended in 1988 and once again the area suffered while the business community regrouped and formulated a new strategy.

Building upon the network of research institutions already in place within the region and financed by the burgeoning venture capital sector, a new structural organization arose that borrowed some characteristics from the Silicon Valley model. The strength of an industrial cluster within the region rests on a number of factors. Industry-university ties are crucial for innovation and social learning, as well as for government ties and the supply of knowledge workers. In addition, the public sector provides important support via infrastructure provision, a skilled non-technical workforce, and other quality of life attributes. All of these elements are particularly important for an industry like high

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[32] Kanter describes the innovation, intrinsic sense of accomplishment, and sense of belonging that occurs when work groups are formed that cut across the organizational hierarchy.

[33] Saxenian observed, "loosely linked confederations of engineering teams" (p. 30) that reinforce and encourage flexibility in Silicon Valley, and echo back to the sort of flexible production processes that Sabel (1982) described in the Emilio-Romagno region of Italy. In contrast, Boston's industry at the time was dominated by large hierarchically structured corporations (e.g., Digital Equipment Company, Wang, or Prime); Saxinean argues that these limited the spontaneous exchange of information both within and between companies. In addition, she argues that there was a difference between the relationship that Stanford University had with the industry and that MIT had. While MIT has long had ties with industry, the set of firms that were at the center of the MIT-industry connection did not change to reflect the changes in industrial structure nor anticipate industry changes. MIT's ties to Raytheon and Polaroid and other established corporations endured from the 1930s and 1940s. As the high-technology industry expanded to include small start-up firms, there was no corresponding extension of the MIT-industry connection to include these cutting-edge firms. Compared to their west coast counterparts, Boston's high-tech entrepreneurs were at a competitive disadvantage.

[34] Industry location decisions have traditionally been tied to differences in production costs, including labor, and transportation costs for moving goods to markets. Relatively high costs in New England have historically sent mass production operations elsewhere (Heckman, 1980).

technology, which is characterized by rapidly changing processes and products, strong demand for labor, and intense competition for market share.

Universities in the area, particularly MIT, have expanded existing programs and developed innovative partnerships with area businesses.[35] Also, Massachusetts remains the national leader in per capita federal research and development spending, and it appears this trend will continue as funding from the National Institute of Health, the Department of Defense, and other agencies has recently increased (Degnan, 1998). These factors, along with a strong financial sector – especially the increased availability of venture capital – has allowed for a new industrial structure. The region has shifted focus away from the traditional defense, hardware, and textile businesses and towards software and services. Front end processes like R&D and patents and licenses remain the foundation for the region's strength, and as a result firms are continuously being formed around new technology. There is an important difference between Massachusetts' thriving new technology industry at the end of the 1990s and the industry that was largely responsible for the region's deep recession at the end of the 1980s. The Wall Street generated merger and acquisition flurry has affected the region's new technology sector, and as in other sector's of the economy, new technology entrepreneurs hope to be bought by or merged with existing large public companies. For example, in 1998 alone, almost two dozen Boston area companies were taken over by national corporations in need of first-rate products to ensure a foothold in the ever expanding market surrounding the internet and related products and services.

A Theory of Social Learning

If Saxenian's description of the differences between the social production cultures of Route 128 and Silicon Valley are more or less correct, and if it is also true that the technology-intensive industry in the Boston region is different some dozen years later in the late 1990s, it is crucial to understand that evolution. Donald Schön's interpretation of the life-work of Albert Hirschman may hold some clues. Schön (1994) read Hirschman's work on development in the less-developed countries as an attempt to uncover a theory of social learning. Two points are relevant here. First, that Hirschman's theory of development is one of disequilibrium. That is, the process of development is one of a transition from one disequilibrium to another. The movement occurs because learning has taken place by the economic actors – who are also social and political actors – that allow them to move away from the initial stage of disequilibrium. Notice that there is a role for actors in this economic theory.

That brings us to Schön's second important point. He asks, "What must a theory of social learning do?" (*ibid*, p. 69). *A priori*, learning must have occurred. The evidence that learning occurred is that there is improvement, the "learning activity must be new to the actor, begin and end with more than one event, and be transferable from one kind of situation to another" (*ibid*, p. 69). Furthermore, the theory must identify and clarify what is

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[35] Several programs are in operation with the aim of combining the research capabilities of the Institute's labs with the financial capabilities and business know-how of industry. This dynamic relationship is fostered through a number of avenues, for example, the Industrial Liaison Program, the Entrepreneurship Center, and the Enterprise Forum.

learned, the connections between the learning and thought and the learning and action, how the learning occurs, and who learns. This provides a difficult challenge to a claim that the Boston Region qualifies as a learning region. It is possible that the current strength of the region's technology-intensive industries comes out of individual, firm, and sector experiences during the decline of the region's mini-computer dominated high-tech industry of the 1980s.

While Hirschman largely confined himself to the economic sphere when he spoke about development, the current work on learning regions seems to have a broader context in mind, it seems to also be concerned with social and cultural issues as well. Thus, the behavior of workers and entrepreneurs is just one aspect of a learning region. Robert Putnam's (1998) ideas about social capital can also inform our understanding of a learning region. For Putnam, social capital is analogous to physical capital and human capital, and "refers to the norms and networks of civil society that lubricate cooperative action among both citizens and their institutions. Without adequate supplies of social capital – that is, without civic engagement, healthy community institutions, norms of mutual reciprocity, and trust – social institutions falter" (*ibid.* p. v). Social capital works in a "virtuous circle." The more one has, the more one gets. The thinking here is very much akin to Schön's when he said that the learning must be transferable from one activity to another. Carole Pateman's (1970) theory of participatory democracy foreshadows this position when she argues that the skills of engagement that self-managed workers learned on the "shop floor" were transferred over into other areas of their lives. The cumulative effect should be increased civic engagement, in general.

The Rise of Civic Organisations

Regions with a strong network of civic organizations (e.g, the League of Women Voters; Parent-Teacher Groups; Rotary Club; religious groups; etc.) have individuals with the skills of civic engagement, and who may be more likely to create the sorts of associations that de Tocqueville[36] saw in the 19th Century America. These are non-governmental associations that were created to address social problems. In the 1980s and 1990s, the Boston region became home to a number of organizations and associations that were created as a response to social problems at a time when the public sector was disengaging from these same issues. These initiatives are motivated by a variety of concerns, from aesthetic to ecological to an interest in how the fabric of individuals' lives are shaped, formed, and transformed by the built environment. These examples vary from experiments in housing, in community-based urban economic development, in community-based suburban redevelopment and in agricultural preservation. They are grass-roots attempts for citizens to create and shape institutions through which groups can define and express community values when existing political and economic institutions fall short. They are comprised of groups of individuals responding to disequilbirium in their environment.

For example, the New View Neighborhood Development in the Boston suburb of Acton is an instance of the North American version of Danish co-housing. This development has

[36] Alexis deToqueville wrote that Americans could form an association solve any problem.

been operating since October 1995 and currently houses 24 families in townhouses and customized single-family structures ranging in price from $120,000 to $300,000 (Tucker, 1997; Peck, 1997). As in the Danish co-housing model, the founding residents of New View Neighborhood met for a number of years prior to the physical establishment of the development. They used that time to reach agreement on a group vision of the development; the process was collaborative and lengthy.

At the physical center of the co-housing model are privately-owned residences clustered around common areas for shared evening meals and other social activities. At the social center of the co-housing model is an ideal of spontaneous and relaxed interaction with neighbors. At the governance center of the co-housing model is an organization that is legally a neighborhood association with a rotated leader where all members pay fees to be used for operating and maintaining common areas. In other words, all of this is an attempt to build community from the ground up and then to build residential structures that facilitate and reinforce those social links. This is in contrast to real estate developers who build subdivisions that they refer to as "communities", even before they are occupied by real people capable of real social relations. From the outside New View Neighborhood looks very much like any other suburban sub-division. Indeed, the town street sign that announces New View looks like any other street sign in the town of Acton.

Besides the New View Neighborhood, the Boston region has a handful of other co-housing groups in various stages of development including the western suburb of Hopkinton, as well as in the Cities of Cambridge and Newton and the Boston neighborhood of Roslindale. Co-housing is likely to attract a very small proportion of the region's residents, however, the dissatisfaction with current arrangements that co-housers articulate resonates across the Boston region.

Another example of a citizen initiative responding to disequilibrium is located in the Roxbury section of Boston. The staff and community members associated with the Dudley Street Neighborhood Initiative (DSNI) have harnessed the power of committed neighbors, as well as the private and public sectors. In 1988, DSNI was able to get the power of eminent domain from the City of Boston. As a result they were able to purchase vacant lots in the center of the Dudley Street Neighborhood. Since its inception, DSNI has developed 300 of 1,300 vacant parcels, and restored over 300 units of housing and built approximately 225 single-family residences (*Boston Globe*, 1997).

DSNI is a successful neighborhood-based response to private foundation and City of Boston plans for the neighborhood that were being developed without representation from the residents. Much of the struggle for reuse of abandoned and neglected property was with the City of Boston for violating its own anti-dumping laws and using vacant lots as garbage transfer stations. DSNI's work on redevelopment is characterized by the generation of extensive community involvement and education, including town meetings, design charettes, participation by young people, community visioning exercises, and bus tours to other parts of the metropolitan area. Since DSNI began its work there is evidence of investment by both the public and private sectors. A new police headquarters was opened on November 10, 1997 and Ruggles Center, once intended to house the

Commonwealth's Registry of Motor Vehicles, is nearby. [37] The future of Ruggles Center now includes plans for developers to buy the building from the Commonwealth for occupancy by private businesses and neighborhood services.

On-going plans for the Dudley Street neighborhood are deeply rooted in the neighborhood. Residents are interested in new retail and service establishments, however, they reject large chains. They are interested in new production facilities, but reject pollution generators. Thus, rather than a large chain retailer they favor locally-owned businesses that are committed to hiring local residents. Rather than an auto spray-painting shop or an asphalt plant they favor an urban farm. DSNI's Executive Director, Greg Watson, is quoted as saying, "'[r]ight now, people just know us for getting the land. Ten years from now, we want people to know Dudley Street for what it did with the land.'"(*Boston Globe,1997)*) However, their process, one that is rooted in the community, is equally noteworthy.

In response to limited employment opportunities to gain a living wage, the realities of domestic violence, increased homelessness and other social problems, the Cape Ann Sustainable Communities Project (CASC) was formed. The members of this group are working towards reshaping their community, a process that is intended to change both Cape Ann and those involved in the CASC project. The project has its roots in Wellspring House. Wellspring House is a late-20th century Gloucester, Massachusetts version of Jane Addams' Hull House. Founded in 1981 (92 years after Addams' Chicago settlement house), Wellspring provided a safe harbor for those in need, including the elderly, teenagers, and families.

According to Kathryn Pyne Addelson (1997) Wellspring provides care and services to those in need, but does so while reconstructing the relationship of care. The founding members of Wellspring rejected a relationship where they would be in the position of 'giving' shelter that left their homeless neighbors in the position of 'receiving' shelter. Thus, rather than entering into an hierarchical charitable relationship[38] they entered into a radically democratic relationship of hospitality. That is, as residents, they opened up their house to neighbors in need.

However, it was not sufficient to merely reject a hierarchical relationship based on 'charity' for a relationship of 'hospitality' between equals. Even this transformed way of caring for neighbors left "the structures that are sources of those misfortunes" intact (Addelson, p.3). To address the problems of homelessness they started a community land trust. Individuals with limited economic resources had only to finance housing costs, while the community shared the current costs and future value-increases in land. Long-time Gloucester residents, for example, fishermen facing declining fish stocks or young unmarried mothers, faced few employment options. However, housing costs were bid up in this seaside resort by relatively well-off second-home buyers. A land trust is one mechanism to

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[37] Unfortunately the building has been plagued with environmental problems; after 3 months in the building, workers complained about a variety of respiratory and related problems. The building has been empty for some time; private developers now show interest in the Ruggles Station building.

[38] One critique of the settlement house movement in the era of large-scale immigration to the US in the late-19th and early 20th century period is that these service providers saw themselves as Americanizing the new immigrants. This was particularly true in the provision of activities for children (see Seigel on play in early 20th century New York.)

increase the stock of affordable housing without leaving the community a victim of its own success.

In Ipswich, another community on Boston's North Shore, there is an experiment to change the landscape and in the process change the changers. Cuvilly Farms is an example of community supported agriculture (CSA). Initiative responding to the decline of farms, farming, and "connection to the land" experienced by urbanites. Community members and farmers enter into a 'joint venture' (Kittredge, 1996). Community members annually purchase farm shares in advance of the growing season; come harvest time, shareholders weekly reap a portion of the summer and fall harvest. This relationship allows farmers an alternative to banks for operating capital, while protecting the farmer from the uncertainties of weather and market.

CSA in the Boston region is limited, with perhaps a half-dozen such farms in operation.[39] On their small scale they provide urban and suburban consumers an opportunity to reconnect to the land. Furthermore, those working and living nearby see land kept in agricultural production and not used for residential development, the most likely alternative. To-date the demand for CSA has been expressed in the metropolitan areas higher-priced suburbs. In such communities, CSA is likely to contribute to high land prices there, which get passed on to home-buyers, reinforcing the economically elitist character of these places.

These experiments are interesting for a variety of reasons. In the language of Hirschman, they are project-based responses to disequilibrium. Among other things, these are responses to limited life chances, urban blight and suburban anomie. In addition, these efforts emerged at the interstices of the public and private sectors at a time when both were stepping back from prior engagement in civic life and the provision of services and amenities to the underserved.

The Issue of Local Government

Many of the citizen-based efforts that contribute to the Region's strength are a response to the economic conditions that are generated by Boston's industrial structure and have been left to stand by the federal, state, and local governments. Sometimes the government distance from a response is a reflection of political will. Sometimes, the structure of government itself limits public intervention. In all of New England the direct participatory form of democratic governance is deeply entrenched, and Eastern Massachusetts is no different. The region's dominant form of government is both a strength and a weakness. While there are many variations on the town meeting form of government,[40] this form of

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[39] Besides Cuvilly Farm in Ipswich, there are CSA farms in Lincoln, Sharon, Weston, Framingham, Amesbury, and Newton. The majority of Massachusetts approximately CSA farms are west of Worcester, with Cape Cod supporting a few.

[40] Local governments in Massachusetts are either cities or towns. Within the Boston Region designated here there are over 100 Massachusetts cities and towns. Cities have mayors and elected city councilors; the mayor serves as the chief executive while the city council provides district representation. Towns have 'boards of selectmen' who are elected to represent districts. Towns convene town meeting at least once a year. The moderator is elected to run the meeting. The town's professional staff is hired by town's operating officer, either a Town Manager or Administrator, each having somewhat different statutory responsibilities. The chief operating officer serves at the pleasure of the board of selectmen. Some towns have open town meeting open to all registered voters others vote meeting representatives. Tradition and size play a large part in determining the precise form of governance in each town.

governance, coupled with the 'home rule doctrine'[41] does a lot to give residents a strong sense of place and connection to local institutions. However, it also tends to create institutional barriers to regional thought and action.

While the public sector is limited in its ability to think and act regionally, the market is indifferent to city and town boundaries. Certainly, finance capital has a long tradition of seeking the highest returns on investments regardless of borders. The 18th century Boston merchants and financiers who profited from the young nation's westward expansion and trade with the Far East, in turn invested those profits in the industrial mill towns of Boston's hinterland, are only one example of this. While it is far easier to move capital over distances, the history of transportation and telecommunication can be seen through the prism of increasing labor mobility. Improvements in public transportation meant that workers could seek employment beyond the range of intra-city public transit. Then, as highways improved, workers could seek employment beyond the range of inter-city public transit. While capital and labor markets both have relatively long geographic reaches, land markets are fixed in space.

One result of these differences is that while the capital and labor markets partially determine both the supply and demand for developed land, there is no market mechanism for expressing community preferences. In the Boston Region, the political mechanism for expressing community preferences is largely via town governance structures that do a relatively good job in allowing citizens to influence decisions made locally that have an effect on local institutions like schools, parks, police and fire protection. However, the relatively small size of each of these local governments, coupled with the popular impression that local control would be lost were regional governance structures strengthened or created,[42] leaves communities free to be shaped by powerful market forces that, in fact, have significant "local" effects. The irony is, of course, that joining in some sort of regional compact could conceivably result in *less* of a loss of local control than the *status quo*.

Conclusion

We have tried to address the question, "To what extent can the concepts of a 'learning region' explain the strength of the Boston metropolitan region?" The current literature on learning regions implies expectations about how businesses and industries organize production; the way in which workers behave in these internationally competitive and agile firms; the role of government; the governance mechanisms; the kinds of neighborhoods the region's residents live in; and how residents organize social and cultural life at the interstices of the public and private sectors. This is a somewhat different and more vague notion of social learning than the one Donald Schön teases out form the work of Albert O. Hirschman as it involves not only social capital, but also intellectual, human, and physical capital. However, it is useful to apply Schön's framework in examining the region, for this formulation requires an awareness of who the actors are, what the learning is, and how it

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[41] Home rule allows local governments to carry out any function, except that specifically denied by the Commonwealth's constitution or the legislature.

[42] Indeed, county level government was all-but dismantled. On July 11, 1997, Governor Weld signed legislation that abolished Middlesex, Worcester, and Hampden Counties. The entire system is likely to be abolished in 1999.

is accomplished. For Hirschman, economic development emerged out of the negative feedback from failed experiments, and using this criteria alone, it appears that Boston is indeed a learning region. Accomplishment built from the collapse of once-dominant industries is a hallmark of the region's economic history.

At this point, however, we fall short of Schön's requirement that we can conclusively define how the learning was accomplished and by whom – though we do have hints that suggest possible answers. It is also important to recognize the inherent difficulty posed by the complexity of relationships between and among industry sectors, public institutions, universities, firms, and individuals. An obvious place to begin is through the examination of the partnerships between the federal government, industry, and academia which extend back more than one hundred years. At their best, these partnerships are the locus for mutual learning. Through successive waves of economic success and decline, the collaboration between these entities has allowed the region to progress and remain competitive regardless of the problems presented by fragmented local government, geographic drawbacks, or economic cycles.

However, the story of a region cannot simply be understood through its economic performance. A look at the Boston metropolitan area's spatial structure also gives clues to the process of development as it reflects technological, social, and political influences. In the 17th Century, Boston extended approximately two to three miles out from city hall, about an hour's walk. Today, the region stretches out to encompass a second ring-road highway, about a ninety-minute drive from downtown Boston. The region's infrastructure first facilitates this spatial pattern and then reinforces it. In addition, post-WWII demographic changes mean that many households are contributing two workers – and two commuters – to the mix. Moreover, long-standing practice of separation by ethnic group within the City of Boston has left a legacy of a sorting in space by race, ethnicity, and class.

The irony of the region's success may be that along with increased wealth has come increased inequality with respect to income, access to quality education, and availability of services and amenities. This internationally competitive regional economy is still struggling to fully assimilate all of its members as poverty is concentrated within the central cities and among the Black, Hispanic, and immigrant populations. Therefore, the ability to adjust to rapidly changing labor markets and economic conditions is highly uneven based on these lines of separation. The region's education system may be the single element that best captures the measure of how far the region must still travel to narrow the gap between those who reap large economic and material rewards from the high-technology, knowledge-intensive economy, and those who do not. While downsized government may have contributed to some of these inequalities, now it creates the opening for independent citizen efforts, such as DSNI, New View Neighborhood Development, and Wellspring House. These community-based efforts may offer the model that other activists can emulate to harness the wealth generated from the region's current economic success for its poor.

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Introduction to Part Three

Descriptions of Regional Projects

This final section of the book sketches the origins and developmental process of four regional projects. The first paper by La Porte describes the non-traditional learning approach utilised in the Centre for Employment Training in Cleveland, which sets out to integrate disadvantaged young adults in the workforce. The training programme is designed in such a way that it combines basic skills training with instruction in specific occupation-based skills, backed up with a range of other support services.

The next two papers by Deitmer, Drewing and Heermeyer, entitled "Qualification Networks for Shared Learning in Lower Saxony" and the one by Butler and O'Karma ("Partnership between Industry and Education in School to Work Transitions in Northeastern Pennsylvania"), even though dealing with education and workforce development challenges in very different contexts, they both address the similar issue of building co-operation between diverse actors to improve the supply of well qualified young people to meet local needs. The paper by Deitmer et al, examines how a regional based network was established to facilitate the introduction of reforms in the German apprenticeship system, while the one by Butler and O'Karma outlines how an industry-school partnership, comprising 65 companies, 28 educational establishment and five service groups was set up to educate young people in rural Northeastern Pennsylvania.

The final paper by Dondi ("A Regional Innovation Programme in Emilia-Romagna, Italy") focuses on building regional infrastructures to provide targeted education and training to meet the business needs of companies. Dondi discusses a project which promotes the establishment of a federation (made up of education and training providers, research institutes, small industry service consultants and companies themselves) to improve regional training systems in Emilia-Romagna. This project is collaborating with other regions in Europe, which are addressing similar problems, with the view to establishing a long-term cooperation relationship.

CHAPTER 12

Employment Training in Cleveland (US)

Mary LaPorte

The week begins at the Center for Employment Training – Cleveland on a warm and humid Monday morning in late June 1998. Trainees arrive at the Center shortly before 8:00 a.m., in order to punch in and report to their workstations or classrooms by 8:00. Most of the students get off the bus that drops them in front of the enormous old industrial building located on one of the main thoroughfares of the neighborhood. Several of the students walked to CET, a few arrived in old, beat-up cars.

CET trainees are adults who have determined that they will invest about six months of their lives in this training experience so that they can gain the skills necessary to obtain a skilled job. Their vision is to secure employment that will enable them to earn enough money to support themselves and their families.

The path to CET has been difficult and varied. Many of the students have significant deficits in their past which present difficulties in negotiating the job market. Some students have a criminal record and felonies in their past; about half of the trainees have not completed high school, work experience has been spotty, and some students, even those approaching age 30, have never held a steady job. All of the students are economically at a disadvantage. Some receive public assistance to support their children; some qualify under the federal job training program eligibility guidelines as "very low income." Other students have access to this program because they are residents of the Cleveland's Empowerment Zone, created in 1994 as a means of turning three neighborhoods where the poverty rate averages about 46 per cent, into places where people live and work as productive wage earners.

The day begins. The welding trainees are working with their instructor on a specialized fabrication project, designed to teach students production techniques. Machine tool students are working in small teams around the milling and lathe machines, completing individual projects that integrate the training tasks which must be mastered within each of the related equipment competencies. Shipping and Receiving students are in the training area below, completing some hands-on projects for the United Parcel Service (UPS) tracking program recently donated to CET. Three new students who are just beginning their training have completed their orientation and will work in the computer lab with the basic skills instructor before joining the lab instructor for the initial safety training orientation. Throughout the day, the place hums. The sounds of welding machines, cutting torches, grinders and saws can be heard from the second floor. Downstairs, the beeping sound from the towmotor resonates as a student heads out of the loading dock. These are the sounds of people at work.

Perhaps some students reflect on three of their former fellow CET students who started work that morning. Many especially are thinking of Lolita and Angela. Both of these

women were headed out to Loveman Steel Corporation that morning for their first day of work. On Friday, Lolita spoke to all the CET students, showed them her union card and spoke of her starting wage: $10.25/hour, plus overtime. Lolita told other students that she, just like Angela, would leave Welfare behind and move from an income of $400 per month to one of $2000/ month. She and Angela would be the first women hired by that company. Lolita's two young sons had joined their mom for the ceremony at CET last Friday. The look of pride on the boys' faces was tangible.

Key features of the region

A "Come Back Region" would describe the transformation of Northeast Ohio from a declining "rust belt" into an economically revitalized industrial and service center. Northeast Ohio is characterized by highly overlapping local labor markets centered around the cities of Cleveland, Akron, Lorain/Elyria, and Canton. All of these areas have made tremendous improvements over the last several years, in part, through extensive regional collaboration among their existing independent business and education organizations.

In Cleveland, area business leaders joined together under the Jobs and Workforce Initiative (JWFI) and articulated a vision of transforming the region's workforce. Area business leaders had become increasingly concerned that changes in the mix of occupations and industries, job shifts away from where workers live, and gaps between the skills that businesses need and those held by the region's workers, may erode some of the progress that had been made over the past decade.

Even though economists believe that the skill levels of the area's labor force may eventually reflect the demands of local industries, in the interim, far too many workers are being locked out of the labor market, and a growing number of businesses are not achieving maximum productivity. Some recent finding support these concerns.

Tight labor market

The regional unemployment rate has fallen to less that 5 per cent.

Shortage of skilled workers

Employers report difficulty in finding skilled workers as their biggest need. A survey of over 1100 companies in 25 industries across the region revealed that 44 percent of the companies reported difficulty finding workers. A high percentage of employers representing major manufacturing sectors expressed difficulty in finding workers. This was especially evident within smaller firms employing 50 or fewer workers.

Aging workforce

By 2005, 36 per cent of current workers will be retired.

In the absence of population growth, this means that the region will need to draw on a smaller working age population to meet its labor force needs.

Other barriers to employment include increasing skill requirements for jobs, lack of education (less than 59 per cent of Cleveland city residents have a high school education) and lack of transportation to jobs in outlying parts of the region.

Ironically, more than 70,000 area residents, primarily those residing in the inner cities, are unemployed. Thousands more are underemployed or have given up looking for work.

Relation of the CET project to the region

The creation of CET-Cleveland emerged as one of the major recommendations of the JWFI. CET-Cleveland is a replication of a highly acclaimed national model based in San Jose, California that was founded in 1967. The Cleveland program is independently operated and controlled. Regional sponsors of the program include CAMP, INC. (a regional manufacturing revitalization organization), and The Greater Cleveland Growth Association (the largest chamber of commerce on the U.S.). Local partners are the City of Cleveland, The County of Cuyahoga, The Urban League of Greater Cleveland and Vocational Guidance Services.

The Center for Employment Training (CET) is a San Jose, California, organization which links disadvantaged individuals to the workforce through an innovative training approach that incorporates basic skills upgrading with instruction in specific skills and necessary support services. The U.S. Department of Labor (DOL) has identified CET as a national model for replication because of its cost efficiency and effectiveness in training the hard-to-serve and its utilization of a unique job training design. CET has trained and placed over 70,000 men and women in jobs since its inception in 1967. Training at CET involves an integration of skill training, basic skill instruction, and human development. The 43 CET centers across the nation offer twenty-eight job-training options. The U.S. Department of Labor approved Cleveland as a CET replication site in October 1996.

Theoretical Model

The CET Training Model is a non-traditional learning model broadly recognized as a *Contextual Learning Model.* Elements of this design include:

- Individualized self paced instruction
- Integrated basic skills and vocational instruction taught for 36 hours per week.
- No prerequisites: students of all abilities may enroll
- Variable course length: students enter and complete at different times throughout the year. All possess similar amounts of knowledge
- Competency-based assessment: completion based on demonstrated competency in skill
- A diploma is awarded upon placement. A job is the goal and the diploma is a record of competency.

Strategic approach

Selection of skill training areas is based on labor market data, employer involvement, projected wages and career opportunities. Initial skill training areas are: machine tool, welding, shipping and receiving, and printing and graphics. Research completed for the JWFI by the Center for Regional Economic Issues (REI) of Case Western Reserve

University ranked major industries by employment in the Cleveland-Akron SMSA. Forecasts of total annual openings in the following key sectors are: fabricated metal: 1,029; machinery, except electrical: 1,239; stock clerks, stockroom or warehouse: 868; printing and publishing: 668. In looking at specific occupational titles, projections indicate at least 225 openings for welders, 1239 openings for production/assembly workers, and over 600 annual openings for operators, primarily in the manufacturing sectors.

The CET training targets occupations providing good wages. An employer survey completed for the JWFI, encompassing 1250 employers, indicated that operators and production personnel in manufacturing are averaging over $18,000 per year; entry level jobs in the printing industry are averaging $20,000 per year; and average welding positions are $20,600 annually in the Cleveland area. A survey of shipping and receiving positions conducted by CAMP in 1997, based on data form 300 local private firms, yielded an average wage of $10.40/ hour.

Learning environment/network

An important network, related to career-ladder opportunities, exists with the project's relationship with industry and one of its sponsoring partners CAMP, Inc. During the past year CET has worked with its machine tool industry advisory committee and members of the CAMP staff to explore ways to implement training for the National Skills Standards, Level I Machinist training into the current CET Machine Tool Operator curriculum. The goal is to provide opportunities for credentials through tbe National Institute for Metalworking Skills, Inc. (NIMS) for CET students throughout their training. Students will register with NIMS, complete the performance requirements for Machining Level I, and prepare for and pass basic certification exams. Once trainees have completed the program and entered the workforce. Training and career development can proceed through continued employer-sponsored training and progression within the National Skills Standards continuum. The development of Level II Machining training is underway at CAMP's Manufacturing Learning Center. CET is enthused about this opportunity to enhance the existing CET training and to develop this foundational component of a career and skill enhancement system for machine trades employers and their workers in the Cleveland region.

Innovation

The CET training model is a first in the region. CET Cleveland will be the first program in the CET National network to incorporate the National Skills Standards.

Structural benefits for the region

In the short term, the CET project will begin to fill critical skill shortages and employment gaps in the occupations CET has targeted. At the end of its first year of operations, 27 persons were placed in employment. More than one hundred job placements are projected for the second year. Over the longer term, CET offers a demonstration of a new training model for the region. This may prove especially useful as both the public and

private sectors in the U.S. look at ways to address workforce system barriers and concurrently move large numbers of individuals from welfare dependency to work.

Policy considerations

Success of CET will demonstrate a new training design for moving hard core unemployed to decent paying, career-ladder jobs. Many, flexible approaches, such as the CET design will need to be developed and followed throughout the early years of welfare reform. The CET model may be one of the first grass roots efforts to integrate the national skill standards within an adult skill-training program. The extent to which this can be successfully demonstrated, initially for machine tool, and later for welding and printing, will be of interest to employment and training analysts in the U.S.

Sustainability

Initial operational funding (for three years) has been committed through local governmental sources. Long-term sustainability will depend on diversification of funding streams. The program will need to become accredited through the state board of education in order to qualify for federal student grants/loans.

CHAPTER 13

Qualification Networks for Shared Learning in Lower Saxony in Northwest Saxony

Ludger Deitmer, Peter Drewing and Reinhard Heermeyer

Introduction

The vocational education and training (VET) system in Germany is facing major challenges in responding to economic and social changes. The conceptual framework underlying the reforms, being put forward, lays particular emphasis on the need to develop high-level skilled workers who can contribute towards "shaping" and influencing the "new" work environment. This relates to the promotion of more effective management and production systems in enterprises as well as the strengthening of the social capital of regions. . In reality, this means enabling people (and in this paper we are mainly focusing on apprentices undergoing their initial vocational education and training) to develop "Gestaltung" competencies, that is, social and organisational "shaping competencies", so as to be able to contribute to the design of their work environment as well as act within flexible organisational structures. "Vocational education and training should enable people to exert influence on these processes both individually and collectively through promoting their shaping abilities". This conceptual framework for the German VET policy has been incorporated in constitutional regulations. However, despite the fact that it has received wide backing from industry also, the basic concepts have still to be validated (and disseminated) throughout the whole German VET system, and particularly in the more disadvantaged regions, such as the Wilhemshaven area in Lower Saxony in Nortwest Germany, discussed here.

The German VET system is organised according to the "dual system" principle ("duale Berufsausbildung") which means that vocational education and training activities are the responsibility of industry regarding learning at the workplace (including in-company training centres) and the responsibility of the state for formal education in vocational schools and colleges. In other words, company-orientated training is complemented by part-time formal education and training in vocational schools. In this respect, the three-year German apprenticeship "dual system" approach is based on a partnership principle (which can be seen as a kind of qualification network) combining companies and vocational schools. Within the last ten years, however, the provision of apprenticeship training places has declined drastically in certain industrial sectors and in particular in the metalwork and electrical sectors, drastically affecting regions such as Wilhelmshaven. Besides that, there is a great need to improve the overall quality of training, at a structural level, through building better relationships between companies and schools, and also from a curriculum development perspective.

The Wilhelmshaven GoLo project

The GoLo project shows that it is possible to respond to the above demands through regional-based actions. The region of Wilhelmshaven, in the north west of Germany, bounded by the North-Sea, has experienced massive de-industrialisation in ship building and other related heavy industry sectors over recent years. It lost over 15,000 industrial jobs during the l980s and the mid 1990s and the unemployment rate rose to 20 percent. The effect of this economic decline was that training places declined by over 50 percent between 1980 and 1995. Clearly, Wilhelmshaven is a disadvantaged region in the German context. But, how does one react to the above assertion, when paradoxically, at the same time, there is a great demand for people with skills in the new technologies such as, CNC, SPS and Bus-systems?

The GoLo-project was developed by companies and vocational educational training professionals from local VET bodies, to stimulate innovation in the regional VET system. The main aim of GoLo was to increase the number and quality of apprentices being trained in the region. Through close co-operation between HRD managers from different industries, VET professionals and other interested bodies, a network with a focused objective was established.

The partners in the network comprised a major VET body, an employee association; numerous companies in the metalwork and the electrical industries, a University and other national networks from different parts of Germany. (For a full list of the partners in the network see end note 5.) The care taken in the initial selection of the partners is a critical factor in making for the success or failure of a network. In this regard, there are many lessons to be learnt from network case-studies over the last ten years.

The employee association took the initiative initially, through persuading six companies and the large local VET body to come together to form a network. This shows how important institutes or individuals, willing to take initiatives, are in starting up learning and qualification networks. During the course of a number of small conferences, these companies identified their needs, which in the main related to difficulties in offering full-time learning opportunities or training courses for apprentices.

The idea of a network or a collaborative action was born out of a plan to exploit the individual strengths of the different companies in order to provide a broad-based and comprehensive training curriculum. A *rotation model*, in which apprentices rotated between one company and another, was seen as a way of providing a broad qualification profile. Thus, all the participating companies shared in the provision of a vocational training programme, with the local VET body providing complementary vocational education.

Objectives of the project

The key objectives of the project were:

- **to set up** institutional models (including financing strategies) to support effective and sustainable co-operation between industry and local vocational schools and colleges;

- **to integrate** training managers and local VET professionals in regional innovation activities;
- **to develop instruments and guidelines** to support systematic exchanges between apprentices, employees, companies and training bodies;
- **to design and implement transfer activities** to pass this model on to other regions in Germany.

The Working of the Network

In the establishment of the network, it was necessary to analyse the specific strengths and weaknesses of the different partners. This time-consuming and difficult process of network formation showed that while all of the partners had strengths in certain areas, they all shared a common lack of learning resources. During the network building phase, it is necessary to have competent moderators. In this respect, in Wilhelmshaven, Mr Pierschl from the training co-ordination body and centre of the local employee association (Bildungswerk der Niedersächsischen Wirtschaft, with the back-up of the VET body, played a key moderating role.

As the new training principles were introduced in the companies, they received positive feed back from apprentices, trainers and VET professionals. In particular, the more active work-based learning environment proved to be very attractive to the apprentices. One of the acknowledged problems in the German system is the overemphasis on school-based learning undertaken in a formal learning environment. This project introduced a new curricular approach which emphasised "work-process" learning at the shop-floor. Thus, students learnt through solving real problems in a learning environment in which working and learning tasks were integrated. What is more, students had to analyse and document their learning tasks and present their findings to their fellow learners. These learning and working tasks were derived from "real" workplace problems. It also proved to be very attractive for the apprentices to learn in different working and training environments in the other companies.

In general, the companies participating in the network appear to be devising innovative solutions to their training problems, demonstrating the benefits of self-questioning and opening up one's environment to outside bodies and external influences. Complex innovation processes need more external knowledge and smaller companies, especially, need environmental thematic networks to overcome information and "know-how short falls". (Rauner 1995). As "knowledge-based work processes" become more widespread the need for these self-learning networks becomes more acute.

The network has now got more than fifteen companies, spread out throughout the region of Wilhelmshaven, and from different branches: mechanical engineering, the oil industry and the supply service industry. The number of company trainers involved in GoLo has risen from six in the beginning to thirty-seven today. The number of apprentices has increased to the present level of 250.

Conclusion

The main conclusion of the GoLo project is that regional dialogue and co-operation has helped to address some of the problems facing the vocational education and training system. Through the social dialogue process, human energies were mobilised, enabling the region to begin to manage the modernisation of its VET infrastructures, using its own internal resources and not overly depending on external restructuring measures. The success indicators are – more training places, better training quality, and higher levels of co-operation between the key actors in the region.

The "rotation training" model, in particular, has proved effective from the individual trainees perspective but also more importantly in many ways, from the companies point of view. The latter have had the opportunity to develop a "networked economy." The work-based learning methods introduced, in which the apprentices learn through solving problems in a team-based setting, has also proved to have been successful.

The institutionalisation of regional dialogue also proved to have been reasonably successful in bringing together the different stakeholders in the region to jointly identify problems and draw up a collaborative strategy to solve them.

CHAPTER 14

Partnership between Industry and Education in School to Work Transitions in Northeastern Pennsylvania

Peter R. Butler and James G. O'Karma

Organization

The Northern Tier Industry and Education Consortium (NTIEC) is a School-To-Work, private, non-profit organization, located in a five county region of rural Northeastern Pennsylvania . The organization is a partnership of industry and education with a mission of creating a highly skilled work force in the five county geographic region, through integration of school, employment and training processes. The organization is represented by sixty-five organizations in business and industry, twenty-eight educational institutions (secondary and post-secondary), and five service groups. The organization was incorporated in 1994, and has been running successful school-to-work activities for the past four years.

Features of Region

The five county area serviced by NTIEC is economically disadvantaged and is a rural area. In Northeastern Pennsylvania, manufacturing industries comprise nearly twenty-five percent of the total non-agricultural wage and salary employment. These are considerably above state and national ratios. The manufacturing sector, along with technical and service occupations, will continue to be a primary source of high paying jobs in the NE Pennsylvania region. These jobs will require that the workers possess skills essential to job performance and to a rapidly changing technological world. Job skills such as critical thinking, the ability to think creatively in a team setting and basic math and literary skills will all be required for a person to compete and hold a job in this marketplace.

Learning Region

NTIEC has determined that the analysis of local labor markets and their skill needs is essential to the development of a skilled workforce. In 1996, NTIEC, in conjunction with Wilkes University, completed a labor market and skills assessment for its area. In 1997, Wilkes and NTIEC completed a thirteen county training needs assessment of the larger Northeast Pennsylvania area for a sister group. These assessments included direct employer surveys wherein employers detailed skills needed by employees and the training required for these skills. The skills required of industry, in all these studies, were consistent with those identified in the SCANS report and National Education Goals 2000, including specific character, technical, and high performance work skills. Students who possess these skills will be highly valued in the marketplace and prepared for a successful and rewarding career.

Results of the 1996 *Northern Tier Training Needs Assessment* completed by NTIEC and Wilkes University indicated the following predominant training needs of employers in specific skill areas. Area employers, in response to a comprehensive mail questionnaire, indicated a need for training in areas of technical skills, basic character skills and high performance workplace skills.

The study went on further to report that:

- "What appears to be necessary is the expansion of certain curriculum, the development of some new curriculum and an incorporation of on-site experiences for students and teachers.
- All secondary schools should incorporate school-to-work principles into their co-op or diversified occupation programs including youth apprentice opportunities for academic and Tech Prep students.
- NTIEC seek professional assistance for teachers' education relative to applied curriculum.
- NTIEC connect the many activities of the secondary curriculum and a workplace experience."

Strategic Approach

Effectively, the need has been documented to provide work based learning experiences in a school-to-work environment so students can compete, along with their employers, in the national and international marketplace. The School-to-Work effort has, as part of its mission, the changing of basic values and assumptions in education in order to provide this work based learning experience. In many cases secondary and post secondary curriculum are out of sync with business requirements and those educational requirements of the high performance workplace. However, in order to change these core-culture educational values, and provide work based learning curriculum and experiences, it is necessary to provide structural support and reinforcement to the employees involved in the change. This support must be offered to the teachers, administrators and decision makers regarding the changing of the educational system to include work-based learning and out of classroom experiences.

In this regard, NTIEC proposed to the Commonwealth of Pennsylvania (and implemented during the period May through September, 1997) a School-to-Work Challenge Grant for staff development projects that would provide support for the above mentioned cultural change to take place. These projects included:

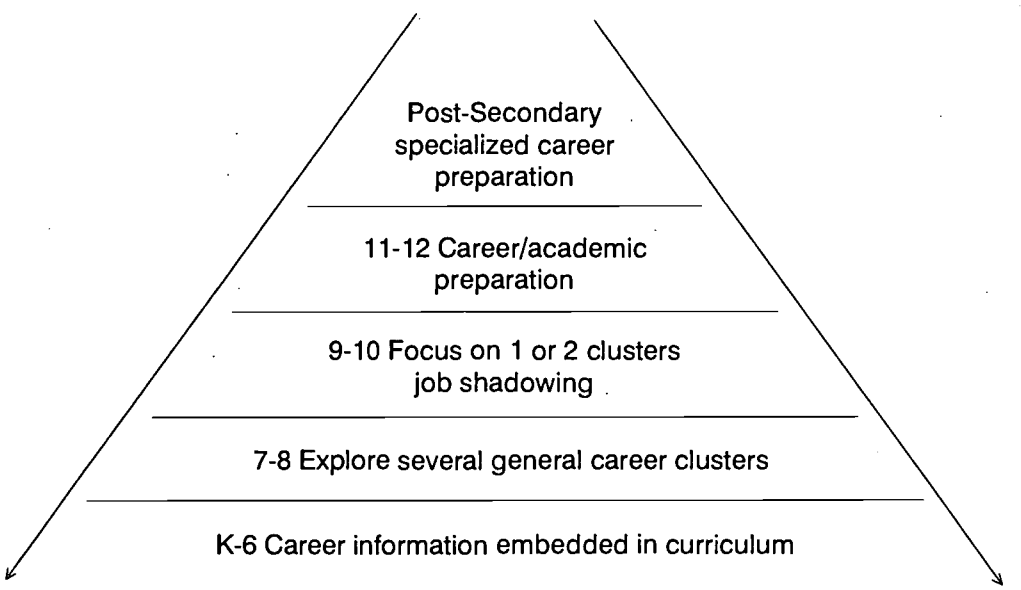
- the development of a Leadership Institute (with 10 corresponding program design activities);
- the acceleration of the successful Educators in the Workplace training program run by Keystone College and each Partnership (100 teachers trained);
- delivery of a targeted summer Career Education Workshop (150 teachers); and
- undertaking a Partnership Development conference (60 attendees) to build regional Partnership unity.

The results exceeded the initial objectives and included the addition of three new staff development projects.

Theoretical Models/International Dimension

NTIEC activity is based on a number of theoretical models, the most significant of which deals with the concept of Career Awareness in schools. This model involves the implementation of a *Career Awareness Program* in each secondary school. Career Awareness is the fundamental school-to-work program needed to be undertaken if a school is to successfully implement the change to a career-driven system of education. NTIEC and the State Department of Labor and Industry and Education representatives travelled to Europe in 1996 on a benchmarking trip to study the German, Austrian and Swiss Career Awareness programs in their schools. All students in the European systems receive extensive career guidance from are encouraged to have career plans developed prior to entering high school. The effort put forth by both business and education results in substantial benefits to both the students and their eventual employers. The students see a clearer connection between their education and career goals. Their motivation propels them from their schooling into employment since they have already tested the waters of compatibility and interest.

Based on this European experience, NTIEC developed a computerized Career Information Network and developed a number of formal Career Awareness programs and training workshops for teachers. The Commonwealth of Pennsylvania's Department of Labor and Industry through its Secretary, Mr. Johnny J. Butler, supported the pilot career education effort of NTIEC. The model begins in grade K with embedded career information in the curriculum and then is designed to continue through post-secondary preparing students to enter the workforce of the 21st century with specialized career preparation. This is depicted below:



Sustainability

The Commonwealth of Pennsylvania considers the NTIEC one of its model programs and has evidenced that fact by providing $600,000 in School-To-Work project funding to NTIEC over the past four years. In addition, NTIEC has been able to secure $158,000 for 1996-97 and $ 170,000 for 1997-98 in Federal Appalachian Regional Commission

funding. In addition, $60,000 in other private foundation and School-To-Work organization funding has been raised. The NTIEC is also one of four sites in the United States selected by the National Alliance of Business to model methods for advanced technical education. NAB has supplied NTIEC with a grant for $20,000 to undertake school-to-work activities. NTIEC has also received $22,000 in Commonwealth Job Training Partnership Act funding and another $10,000 in regional school intermediate unit funding.

NTIEC received three third party consulting contracts to perform School-To-Work services for School-To-Work efforts in Monroe County and Tioga County, Pennsylvania and for a five county area of NE PA on behalf of the Northeast Pennsylvania Industrial Resource Center. NTIEC has partnered with Wilkes University, Penn State University, Keystone College and the Lackawanna Junior College in many of its efforts. On a regional level, NTIEC has organized and coordinated a regional School-To-Work Leadership Council which is a roundtable of all local School-To-Work initiatives in Northeastern Pennsylvania. The NTIEC Chairman is a member of the National Alliance of Business Employee Advisory Board on STW practices and is a member of the board of the Commonwealth of Pennsylvania's statewide Human Resources Investment Council.

Impact/Innovation

NTIEC has placed several hundred young people in job experiences over the past four years and NTIEC has placed over 300 teachers in its "Teachers in the Workplace" program. NTIEC has also sponsored for two straight years, on a regional basis, an entry in the "US FIRST" engineering and computer modeling robotics competition. This competition is held at Rutgers University and at Disneyworld in Orlando, Florida.

NTIEC recently developed a "STW Regional Leadership Institute" where key individuals in the STW process, "the educators and administrators" in the school systems, are provided with training support so that they can undertake School-To-Work activities related to subjects such as – applied curriculum, job mentoring, job shadowing, and youth apprentice work. Employer mentors are also involved in this program.

The Northern Tier Industry and Education Consortium (NTIEC) has long been a key advocate, strategic planner, provider and implementor of educational and training concepts for manufacturers in the Northern Tier of Pennsylvania. As such, NTIEC completed the Workplace Skills Assessment project which defined relevant competencies and skills for jobs in industry in the Northern Tier.

NTIEC is one of the only school-to-work partnerships in the nation that clearly documents business savings from these programs. NTIEC has also developed and pioneered a workforce enhancement program for school drop-outs. NTIEC has incorporated as an assessment tool the WORKKEYS system as developed by American College Testing, Inc. NTIEC has partnered with other local organizations in implementing one of the first automotive technician training programs in the nation. This has been sponsored by General Motors.

CHAPTER 15

A Regional Innovation Programme in Emilia-Romagna, Italy

Claudio Dondi

Introduction

This paper outlines a major innovation project (J100-REGIONES) undertaken by the Regional Administration of Emilia-Romagna, Italy in the framework of the ADAPT initiative of the European Union between 1995 and 1998. The purpose of this project undertaken by the Department of Employment, Education and Training of the Regional Administration was:

- to improve the capacity of the training system to respond in an effective and flexible manner to the information, training and consultancy needs of actors in the local economy, with a special focus on SMEs;
- to promote a federation of regional education and training providers linking them with research institutions and SME service providers, and to involve enterprises in the direct provision of training;
- to develop a new generation of transnational partnerships with eleven other Regions in Europe through establishing a solid infrastructure for collaboration and long-term relationships among organisations with similar profiles.

The J100-REGIONES project is of interest from the following different points of view:

- its integration in Regional development policies, its strategic orientation combined with its bottom-up approach;
- the level of involvement of different local actors in a common effort to provide information, training and advice to SMEs;
- the role assigned to enterprises in the design and provision of training;
- the transnational co-operation model, which generates significant outputs and a shared learning culture among all actors involved in the regions of the twelve partners.

In this paper a short outline of the regional context is followed by an analysis of the evolution of the regional training system. The main intervention methods and main results of J100-REGIONES, both at regional and transnational level, are then described. Reflections on the contribution of J100-REGIONES to building up a regional and inter-regional learning network conclude the paper.

Emilia-Romagna – The Regional Context

Emilia-Romagna is one of the large Regions in Northern Italy, known for its cultural heritage and dynamic economy – based on SMEs – with an international profile and high exports. Emilia-Romagna has nearly four million inhabitants and is divided into nine provinces.

The Emilia-Romagna industrial sector has been studied since the 1970s. It is seen as a place where two models of exponential growth of SMEs were developed: the "imitation" model, which applies to knitwear, ceramic tiles, footwear and tourism, and the more sophisticated "integration" model, relating to automatic packaging machines, car and motorbike components and agricultural machinery. Both models generated a number of highly specialised "industrial districts" across the Region, where the main actors comprise thousands of SMEs. Similar kinds of industrial development were also observed in other parts of Italy (North-East and Adriatic Regions). Emilia-Romagna was also seen as a model of vigorous economic development to be replicated in other parts of the world.

The industrial associations and the Regional Administration ("left wing" since the end of the Second World War) through a paradoxical process of political confrontation and practical collaboration, managed to co-operate to build a capillary service infrastructure for the myriad SMEs in the region. This was in response to the shared view that SMEs were not able, on their own, to benefit from research results or to open new markets and adequately train their staff. A network of sectoral, and later on, horizontal service centres were created in the 1970s and 1980s by ERVET (the Regional Institute for Development, involving the Administration as the major shareholder with the Regional Banks and Industrial Associations) to support SMEs in carrying out a range of functions that only a large enterprise could develop internally. A virtuous mix of collaboration and competition has characterised the behaviour of Emilia-Romagna's SMEs since that time, resulting in the construction of a surprisingly cohesive system.

The Evolution of the Regional Training System

At the end of the 1970s, the legislative and administrative competence for vocational training was transferred from the Ministry of Employment in Rome to the Regional Administration in Emilia-Romagna. At that time the training system was comprised of a very traditional set of vocational training centres, run by Labour Unions and Catholic Organisations to provide basic professional skills for young people (aged 14-16) who had not completed upper secondary education.

However, in the 1980s and 1990s, there was a shift of focus towards continuing education and shorter courses for young people to assist them make the transition from school (or university) to work. Several hundred teachers and trainers went through re-training programmes to enable them to carry out these tasks. This entailed major investments in people and materials. Equipment was renewed and tools for "training-needs-analysis", organisational development, quality assurance were purchased for the training centres. All of this was accompanied by an ongoing review and evaluation. Rolling plans in the form of "Regional Directives" were drawn up every three years and short terms goals were defined every year. A high priority was given to the topic of regional policy making, including the setting up of a high level co-ordination committee for training, with the active participation of the social partners from both sides of industry – employers and trade unions.

Already at the end of the 1980s, Emilia-Romagna was being cited as a region that had succeeded in transforming an ancillary social service into an active labour market policy tool. Many training organisations and consultancy organisations, which had participated in

the innovative processes of that period, later became very active on the national and European scene. However, from a negative perspective, with the training system becoming rather content with itself due to the positive feedback it was receiving, there was a danger that it would become complacent. There was also a tendency in the region to begin to look inwards and evaluate its performance according to its own sometimes rather "closed" reference criteria. When the Regional Administration became aware of this risk, it introduced Regional Directives during the years 1994-97 to encourage more self-critical reflection and much more active cross-institutional collaboration between training organisations, research and educational bodies, and also very importantly, including enterprises in the design and implementation of training policies and actions.

J100-REGIONES in Emilia-Romagna

When the European Union ADAPT programme appeared, the Regional Administration realised that it was an excellent opportunity to implement and strengthen the innovation actions mentioned above. Given the legal competence of Italian Regional Administrations in the field of training, most of the ADAPT funding was attributed to them directly. The Emilia-Romagna Regional Administration decided to reserve about 30 per cent of the ADAPT funds available to the region to establish a major meta-project (costing over 10 million EUROs) with the view to encouraging collaboration between different entities to provide information, training and consultancy to local enterprises.

In order to balance this top-down approach with a bottom-up initiative, an open call for proposals was launched, that required the setting up of a significant "pool" of organisations to participate in the programme, in particular, to design and introduce a range of "actions" involving "user" enterprises. The result was the approval of 17 "training innovation projects" involving more than 400 organisations in the Region and distributed across many industries. In a sense, training organisations were "obliged" to collaborate in order to get funding. This should be seen in a very positive light, however, as bodies which had never exchanged information in a serious way before, found that they shared common interests and began to become aware of their respective strengths and weaknesses. Hundreds of enterprises became active in joint innovation and group learning projects. Several ad-hoc consortia also, established as a result of the call for proposals, began to play a key role on the national and European level. Two other important innovations supported by the ADAPT project were the systematic use of electronic communication – a large intranet was set up where all the information relevant to the individual projects was available – and the development of a comprehensive evaluation instrument, dealing with administrative, technical, and socio-economic aspects of training.

In the first stage of J100-REGIONES some participants, in particular the industrial associations and trade unions, which risked loosing the large degree of control they had over the training bodies, were unhappy about the project. There was also a criticism of the technocratic flavour of the project when it was introduced initially. At the mid-term review meeting of the social partners, changes were made to the ex-ante evaluation procedure to guarantee a full representation of social and economic bodies in the second cycle of the project called – REGIONES BIS – and which began in 1998 and will run until 2000.

Another adjustment made centred on the formation of a Regional User Group, composed of industrial representatives directly from enterprises and not just their associations. The establishment of this group, which was consulted several times during the life-span of the project, facilitated more direct involvement of enterprises in training activities at the regional level and sectoral groups at the transnational level.

The Transnational Side of J100-Regiones

The other European regional projects participating in J100-REGIONES with Emilia-Romagna were – Andalucía, Castilla y León, Comunidad Valenciana, Galicia and Islas Baleares from Spain, Midi-Pyrenées and Pays de la Loire from France, Bruxelles and Wallonie from Belgium. Bayern, Germany and Wales were also official partners of the project. Most of these regional partners set themselves significant objectives, but they tended to be on a smaller scale than in Emilia-Romagna.

Many of the partners participated in special interest methodological groups and sectoral groups. The purpose of the methodological groups was to exchange information, compare training practices, identify common interests and jointly develop tools to support training. The sectoral groups undertook tasks related to – training needs analysis, training of trainers, establishment of telematic networks and the development of common learning products. The work of these groups was monitored by a transnational Steering Group and supported by researchers and project co-ordinators. After an early adjustment phase and a relatively high drop-out rate, many of these groups began to work effectively despite the very modest international experience of most of the participants. The groups (20 in total) produced an impressive amount of outputs, consisting of studies, guides, learning products and mobility programmes.

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Towards the Learning Region

Education and Regional Innovation in the European Union and the United States

This book examines the movement towards regional strategies to address economic and social objectives that has been growing in recent years in Europe and the United States. The driving force behind this movement is a belief that self-directing and outward-looking regional communities can confront the challenge of globalisation and build sustainable social systems in a way that bigger national entities cannot. Regions are small enough to be flexible and manageable, but also big enough to flex their muscles on the international stage.

Community-oriented education and development agencies are beginning to play a major role in these developments. They are catalysts for the production of new ideas. But they are also acting as brokers and mediators enabling groups from the public and private sector to work together to develop the know-how to turn plans into reality. A region implementing an education-led innovation strategy can be called a "learning region".

This book provides an overview of innovative practices throughout regions in the United States and Europe. It contains sixteen papers written by experts from the educational, economic and regional development fields in the United States and the European Union. These papers analyse the ingredients of regional innovation and describe successful case studies. This book is of interest to educators, trainers, community development agents and researchers who want to know more about the area of community-oriented education and training. It has a particular relevance for those with an interest in relations between the European Union and the United States.

Barry Nyhan, Graham Attwell and Ludger Deitmer (eds)

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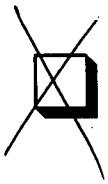

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