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TRANSNATIONAL AND LOCAL "LEARNING" IN AUTOMOBILE COMPONENTS SUPPLY COMPANIES:

MAQUILADORA COMPANIES IN NORTHERN MEXICO

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INTRODUCTION[1]

The "learning region" has been an important topic in regional sciences since the 1990s. But this perspective, which concentrates primarily on specific regions, seems to be problematical because in many cases regions are part of interregional and sometimes even transnational processes. Often these transnational processes emerge as a result of the behaviour of companies. In this study, it will be discussed if these learning processes lead to effects that are important for the local labor market. These effects are the link between the micro-analytical view (into the company) and the macro-analytical view (into the region).

The empirical study was conducted in 2001 in Ciudad Juárez. The results are based on case studies in 12 companies of the automobile components supply industry (interviews with managers, technical trainers, employees in human resources, and engineers), and in 8 other production plants in different economic sectors, as well as on expert interviews in technical training centres, the chamber of industry, associations, especially the AMAC (Asociación de Maquiladoras de Ciudad Juárez), the local interest group of the Maquiladoras, and in public administration. The interviews were inspired by methods of qualitative social research.

TRANSNATIONAL AND LOCAL LEARNING

It is not a new perception that we live in a period of growing transnational interdependencies. The broad discussion that has developed on the different aspects of globalization cannot be repeated at this juncture. The globalization of company organizations takes place in specific frameworks, and it is shaped by interaction with other actors and institutions. A concept that helps to analyse these regulating influences is that of governance. Even if we already know many specific contents of

[1] The paper is mainly the result of a research project on "Know-how intensive networks in the manufacturing industry: the integration of Ciudad Juárez, Mexico, in transnational processes of ´learning´?" completed in 2001. The results are supplemented by insights from a new project about the "International division of knowledge intensive functions in transnational companies: the electronic components suppliers to the automotive industry". Both projects are supported by the Volkswagen Foundation.

"governance", we can understand the core as follows: governance is a special kind of regulation. In contrast to "government", "governance" not only refers to the state but to the different actors being part of a social network. Thus, "governance" refers less to single actors than to networks of actors who regulate the political, economic, administrative, social and cultural spheres (Messner / Nuscheler 2000). It seems plausible that governance is important as global governance on the world level, but regulation also effects different spatial scales. In a specific sense, ´governance´ on the global level or ´regulation´ on the different scales can be seen as the environment for enterprise organizations that shape the learning processes.

Especially in the 1980s and 1990s, theoretical concepts, as "clusters" and "industrial districts", influenced the discussion. The networks were interpreted as "innovative milieus", for example in the sense of a collective cognitive structure (Maillat 1998), or as networks of small enterprises with a common culture that produce their goods in a close division of labour, or - in a broader sense - as "sticky places" with different kinds of networks between the enterprises (see Markusen 1996). Thus, networks of non-market relations can lead to advantages for the markets of the companies in the region (Schamp 2000: 65-68). The non-market relations are often "embedded" and are defined as social relations or as "culture" - in quite different senses (see e.g. Asheim 1999, Boschma 1999, Grabher, 1993, Hassink, 1997a,b, Hudson 1999, Lawson 1999, Storper 1997a,b). To that extent, the network approach is important for regional economy, as economy is seen as part of the cultural system, too. Also, ´clustering´ is seen as an important strategy for regional development (Lagendijk / Charles 1999).

These concepts, such as the "innovative milieu" and the "industrial district", gave important impulses for the discussion about regional development, but mostly could not give convincing arguments against the critique that the regional networks studied were special examples and could not stand for successful regional development (Sternberg 1995). Thus, the basis for strategies of regional policy was weak. A closer look showed that a central assumption is on shaky ground, too. "Innovative milieus" and "industrial districts" were discussed as examples of endogenous strategies of regional development. But often extra-regional instead of inner-regional factors are important. The problem of these concepts seems to be to concentrate on "the region", rather than on the idea that networks may be important. To that extent, the focus on the learning organization instead of the learning regions should not be understood as complete rejection of the network approach, but as an additional part of analysis, as authors have already suggested as necessary (Boschma / Lambooy 1999, Oinas 1999, Rallet / Torre 1999). This means the inclusion of major business organizations, including transnational enterprises, in the empirical analysis.

ENTERPRISE ORGANIZATIONS, THEIR ENVIRONMENT AND PROCESSES OF LEARNING

The idea that enterprise organizations are part of the socio-political environment has spread since the middle of the 1980s (Piore / Sabel 1984) and was connected to the evolutionary approach of economy in the 1990s. A basic assumption is that company organizations can develop different strategies to solve a problem. Thus, the form of development of the company organization is not inevitable, but a contingent path that has developed gradually by specific situations ("trajectories"). Some possibilities of decision-making are influenced by former decisions, while others are ruled out altogether. Against this background, the model of the innovation process changes. The traditional cyclic concept used in economic geography becomes secondary, because the idea of an interactive innovation process predominates in which all stages of the innovation process are interdependent, and innovation is part of the socio-political environment (see Keeble / Wilkinson 1999). Which innovations are successful, and which not, is dependent on the different conditions of the environment of the enterprise organization, such as markets, national politics, international contracts, cultural conditions and other selection environments in the region. Against the background of "governance", it can be said that the different levels of governance influence the trajectories of

innovation and organizational change connected with these trajectories.

What is important for this stream of evolutionary economics, which is not biologistic (see Astley 1985, Nelson / Winter 1982, Nelson 1995), is the differentiation of knowledge in implicit, or tacit, knowledge, which is not codified, and explicit knowledge (Kirat / Lung 1999, Malmberg / Maskell 1999a, b). These two kinds of knowledge influence the trajectories, and are also a result of the developments, as the chapter 5.3 will show. We also have to bear in mind that the value of explicit and implicit knowledge is not stable but changes all the time. Knowledge can be forgotten (Carmona / Grönlund 1998). On the one hand, this supports the processes of gaining new knowledge but, on the other hand, knowledge lost might have been useful later on and is then missing (chapter 5.2).

In this paper, learning is understood as changes in company organisation which are based on a common mental construction developed by communication of the decision-makers in the company that lead to new rules of conduct. Managers and other persons communicate and define necessities for common action. As such, the thoughts and stategies depend on the different aims of the actors that are connected with the actor's position in the company, with the environment and with personal experience. Learning is a process of combining agreements, conflicts and resistance.

If learning is understood as changes in company organisation which are based on a common mental construction developed by communication of the decision-makers in the company that lead to new rules of conduct, this includes the analysis of the creation of new institutions and, as such, new trajectories. This will be discussed on the basis of examples of companies in Ciudad Juárez, Mexico.

THE GROWTH OF AUTOMOBILE INDUSTRY IN NORTHERN MEXICO

The cities in northern region are growing very rapidly. Ciudad Juárez, located in the Mexican state Chihuahua, is the largest of these newly industrializing towns, but also the other towns close to the border employ more and more workers in the manufacturing industry (Maquiladora). In Ciudad Juárez, the number of enterprises of the manufacturing industry is growing since some decades. Ciudad Juárez developed from a small border town to the 5th largest town in Mexico and the largest border-town. Mostly, Ciudad Juárez lives of Maquiladoras, that - before the ratification of the North American Free Trade Agreement (NAFTA) and new changes of the Mexican tax policy - had high cost advantages of duties and taxes. But still cheap labour is an important advantage - for US companies as well as for European and Asian investors who look for a place for a production plant in Northern America. In Ciudad Juárez, the companies mainly are of two sectors of manufacturing: electronics and automobile suppliers (especially wires). Electronics, automobile suppliers, and - lesser and lesser - textiles and clothing, are also the most important sectors of Maquiladora in general. Although the plants in the central regions of Mexico, as in Puebla, are still important and very innovative, Carrillo already (1990) talks of “maquilización“ in the Mexican automobile industry.

Since some years, these manufacturing industries cannot only be caracterized by assembling, but also by complex tasks. Thus, new standards for quality are introduced, as ISO. Furthermore, new management strategies are needed. The workers need more knowledge than before, and the tasks include more scientific skills. The companies introduce new technologies, and the expensive machines need qualified workers. Furthermore, the plants integrate more and more functions, as construction of the production process and the product. Therefore, the companies offer skills for tecnicians and engineers. But, furthermore, they offer training programmes and education for workers. These three ways of learning will be discussed in this paper: (1) the introduction of global standards, (2) new management strategies, and (3) new organizations for education and technical training. These three elements influence the plants as well as other actors in the region and connect

transnational companies to the system of „governance“ in the region.

LEARNING PROCESSES

Transfer of Global Standards

Global standards are important for the automobile supply industry, and they introduce quality standards. One can recognize a sprawl of the quality standards from the transnational companies (OEMs) to their first-tier-suppliers. But, these first-tier-suppliers need parts of an extraordinary good quality, too. Thus, the suppliers on the second, the third level and so on have to introduce the quality standards too. Thus, the quality standards step from one company in the value chain to the next, and from the transnational to the local companies. More than 75% of the manufacturing industries have introduced ISO 9000 in Ciudad Juárez. They begin to introduce higher ISO-standards as well as ecological standards.

This introduction of quality standards is seen as being so important, that even indirect supply is included, i.e. the suppliers of the canteens. One has to recognize that the regional integration of the transnational companies is stronger with regard to the supply of indirect goods than to the direct supply. I.e. some companies already buy 30% to 40% of the input for production in the region (in Ciudad Juárez and the neighbour states in the south of the USA and in northern Mexico), but 80% of indirect supply. Thus, quality standards may spread to low technology local firms, too.

New Management Strategies

One company examined in 2001 is good case study for the learning process of managers in plants of an international enterprise (see Fuchs 2002). The case study will show, that experiences of the top management with the Mexican labour force were the basis to expand in Mexico, but that the specific experiences of the local management led to a specific strategy of learning. This did not lead to formal institutions, and, as the case study will show, it was „forgotten“ later on.

At the company, which is producing electronic control systems, the learning strategy meant „higher quality“. In the 1970s, the company began to produce thermostats and other electronic control systems in Mexico City. Facing the aim to become world leader of electronic control systems, the company built a new plant in 1976. In this new plant in the city of Chihuahua, the quality management was a big problem. Because of this problem, and as quality management became an important topic in management literature in the 1980´s, the local management implemented continuous quality control already since 1984. This was much more earlier than other companies did. The company was the first enterprise in Mexican state Chihuahua that implemented ISO 9000 (1992).

The learning process of quality control was not a result of implementing a „foreign“ strategy of the US mother company, but was a result of the careful and sensitive behaviour of the local management. The three top managers went to qualitiy training programmes to the mother company in Minneapolis. After that, they communicated and developed the common mental constructions, that these concepts would not fit to the Mexican plant. So, they talked to the psychologist of the plant. The four decision makers developed the common mental construction further, in the following sense: In Mexico, so they thought, time is not so important. The common mental construction included that Mexicans would not live „now and here“, and this could be mainly a result of the cathologic religion that sees individuals as unimportant, or as a „small light in the infinity of the universe“.

It cannot be the aim to discuss this common mental construction as correct or not. But, the strategies resulting of it, brought success. The manager made training programmes for quality control, and, more important, they lived the principle of the responsibility „now and here“ as an

example. This new institution of „now and here“ should be accepted by the employees not only at work, but also at home. For example, the company had a problem with alcoholism in the plant. So, in case the manager saw a drunk person, he did not fire him or her, but - together with the Alcoholics Anonymous - he sent him / her home for this day and said that the person should not drink at this specific day. What he / she will do the next day, should be unimportant in that moment.

As a result of this strategy, the rate of mistakes in production sank dramatically. But, some years later, the management changed, and with them the philosophy of the plant. The old institution, which was embedded in a management philosophy that could be called a welfare strategy, was subsituted by a strategy that was based more on „hire and fire“. So, the rules of conduct that were created by the former management were substituted by new institutions.

While the example of the company shows, how new rules of conduct can develop also on „informal“ basis, but which are quite weak ties, the following example shows the development of new rules of conduct in formal institutions. These new institutions are training centers. As such, they are open for employees of different companies and for the local labour market. As such they are a bridge between big international companies and other, also local, companies, and they can help to develop a link between the workers in local and in international enterprises.

Education and technical training

Companies of transnational corporations employ almost only Mexican personnel, also technicians and engineers. Thus, the companies do a lot to improve qualification (see Fuchs 2002). However, they also need highly qualified personnel from the external labour market. Thus, technical training centres including technical universities were set up in Ciudad Juárez. Ciudad Juárez has two universities. One is the private “Tecnológico de Monterrey“ for engineering and administration, the other is the “Universidad Autónoma de Ciudad Juárez” with engineering and administration, but also social sciences. But more illustrative are some new organizations in Ciudad Juárez. The first of these organizations is the Universidad Tecnológica de Ciudad Juárez. Technical universities have come into being in Mexico since 1989; Universidad Tecnológica de Ciudad Juárez opened in 2001. The school cooperates with regional companies to give their students the required qualifications. Thus, the school has agreements about cooperation with 380 Maquiladora plants, also with AMAC (Asociación de Maquiladoras de Ciudad Juárez) and the chamber of industry. The other important organization is CONALEP (Colegio Nacional de Educación Profesional Técnica), which was initiated by the Mexican government in 1979. Depending on the regional requirements of the economy, the CONALEP plants differ in the qualifications they offer. Since 1993, there is a CONALEP training centre in Ciudad Juárez. The qualifications are mainly technical and organizational competences required by the automobile components supply industry and the electronics industry. The people can visit CONALEP for three years to become technicians, but companies can also send their employees for a shorter time to be trained in special subjects.

The most important example seems to be CENALTEC. It is a public-private-partnership integrating state as well as transnational firms and SMEs. Philips produces electronics in Ciudad Juárez, but also machine tools. The headquarter of this branch is Eindhoven (Netherlands). In 1998, the local management of the machine tool branch of Philips was looking for possibilities to improve the qualification of the workers in Ciudad Juárez. This was also an aim of the top-management in the mother plant, because, on that level, the managers wanted an equivalent standard of technological qualifications in the different plants on the world level. In Ciudad Juárez, Philips, managers of other companies, politicians and members of the Asociación de Maquiladoras created a public-private-partnership called CENALTEC (Centro de Entrenamiento en Alta Tecnologia). The buildings and the infrastructure was paid by the Ministery of Education in Mexico, some further support came from the Mexican state Chihuahua and from companies in Ciudad Juárez. Philips offers the technological knowhow.

CENALTEC opened in March 2000. It is part of INALTEC (Instituto de Entrenamiento en Alta Tecnologia), an organization which has the aim to open further training centers in the Mexican state Chihuahua and perhaps later all over Mexico. CENALTEC offers training programmes for tecnicians that can handle machine tool installations. The aim is a common level of qualification, and certificates that are of the same standard in the different plants of the world. These are further plants in the Netherlands, and, besides Ciudad Juárez, plants in Poland, China und Singapore. The certificate can be reached after a two year training programme, but the training for the external companies can also be shorter (of a half year). One of the managers of CENALTEC is Mexican, the other Dutch. They sent Mexican trainer (the first generation) to Eindhoven to learn details about the production process. The trainer will be sent again to the mother company, when they need a refreshment of their knowledge. These trainers teach others as multipliers at CENALTEC (the second generation). The participants are older than 18, normally the age is between 25 und 35. Usually, their basic education is not less than the Mexican bachilerato. The training is four days of the week in the training center and one day in a company. An important common construction of the two managers of CENALTEC is that it is not only important to give training in „high tech“, but as well in communication generally and English in particular. Also at Philips, the implicit knowledge about quality is an important topic, too. Computer based processes are only the end of the training at CENALTEC. The workers shall learn to organize their work for their own, and they shall learn to plan the process of their task. This was implicit knowledge that existed in the mother company and that is made explicit and transferred to the branch plant. CENALTEC is a good example for a new organization that improves the qualification of the workers not only in one plant, but in different plants, and which includes SMEs. Thus, it makes exchange of knowledge in the region more easy. But CENALTEC is only one example. There are also further technical training centers, but they are mainly created by public institutions, not as public-private-partnerships.

CONCLUSION

Three ways of learning were shown in this paper: the introduction of global standards, new management strategies, and new organizations for education and technical training. These three elements influence the plants as well as other actors in the region and connect transnational companies to the system of „governance“ in the region. But still, social and ecological problems are unsolved in this newly industrializing region (Fuchs 2001). Perhaps, the new discussion about global standards changing the social and ecological conditions (Nadvi / Wältring 2002), and the local change to something like a civil society may introduce a transformation in the northern region of Mexico.

The study showed that transnational companies influence regions by division of different functions in their plants in various countries. That is true not only for labour-intensive production and the export processing plants in the Third World. There are also new tendencies to bringing technology and knowhow-intensive functions to some "nodes of the global network" in the Third World (Fujita / Krugman / Venables 1999, Veltz 1996) - the relations between transnational companies and small and medium size enterprises play an important role for this transfer of knowledge.

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