INTERACTION BETWEEN UNIVERSITY AND VEHICLE FACTORY IN THE FIELD OF QUALITY INDUSTRY

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Abstract:
Currently higher education has become a main strategic resource in the knowledge economy. The higher education institutions facilitate the development of their region, attract students and lecturers to their area, enlarge the human capital and establish workplaces. Nowadays the interaction among universities and industry has a growing role in the economy. The aim of the study is to examine how the actors of the two spheres, economy and education can collaborate with each other and what kind of cohesion effects can the active cooperation cause. This paper is a case study about Széchenyi István University in Győr, where a large automotive industry can be found. Széchenyi István University has wide R&D projects for instance with Audi Factory in Győr, which is the world largest engine plant and offers workplaces for almost ten thousand people. Furthermore the increasing and widening production in the field of vehicle sphere at Audi Factory conducive to the development of SME's in the region where the vehicle industry has become the priority sector. Recently the foundation of the new factory resulted that Győr has become a vehicle factory with the whole vertical processes of car manufacturing, and it means new challenges too. Besides the research and education function, Széchenyi István University has strengthening connection with business sector and provide services for SME's. The major quality-industry, Győr, the University's collaborative, joint development directions is a possibility in which the knowledge and the roles have important meaning for success.

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1. INTRODUCTION

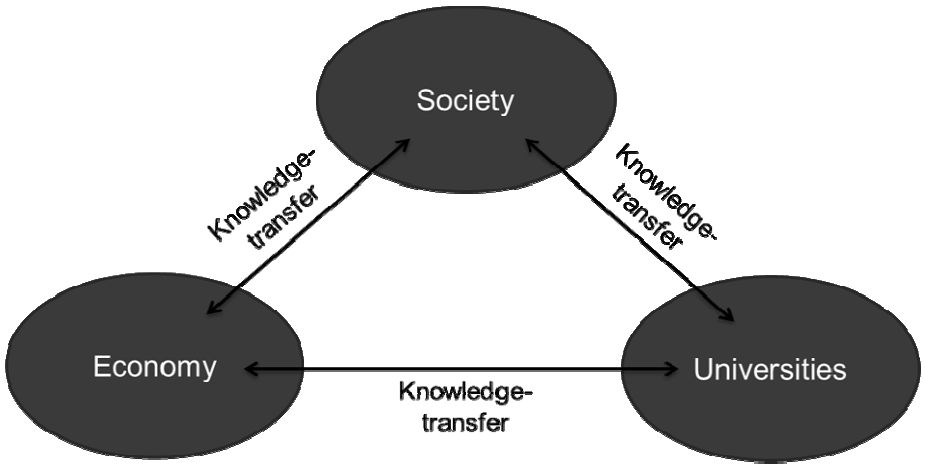
Main purpose of this study is to introduce the opportunities of high education institutions' financial and labour force support by industrial actors. As a case study, we describe the precedent of collaboration between automotive companies and Széchenyi István University, Győr. Furthermore we present the aims, aspects and devices of this cooperation. Győr, located in North-West Hungary is one of the dynamically developing Hungarian cities; it has approximately 130 thousand inhabitants. Győr has a favourable geographical location near the Austrian and Slovakian border along the highway. It is close to the capital cities Vienna, Bratislava and Budapest. Not only it's road connection but also its railway and air accessibility are good, a local airport next to Győr serves charter flights to Ingolstadt (Audi's headquarter) frequently.

Furthermore Győr is economically, socially and as well educationally the most important city of the West-Transdanubian Region. This traditional industrial city has been developed a center of vehicle industry since Audi established there in 1993. The twenty years old company has been growing constantly, provides more and more workplaces and it is an elemental part of the region's economy. In addition there are increasingly stronger collaboration between Audi, the city and the university. There are common interests between Széchenyi University and Audi in order to provide an appropriate quality of supplying professionals from area motor and vehicle production or development, logistics and economics. Learning from the successful model of Győr, it could be possible to support educational and industrial cooperation in other regions too. National economically significant automotive companies have high level of technological development and are able to take a hand in the work of their region's universities, so that they help the supply of professional workers. Hereafter this paper reviews the purposes and aspects of the cooperation and describes the example of accomplishment and its exact devices.

1.1. Theoretical background

Technological development in informatics and telecommunication has occurred changes and challenges for the society in our globalizing world. Knowledge economy and knowledge based society have been evolved in our history. The 21th century came with drastic social and economic changes. This is the era of knowledge based society, knowledge has become such substantial resource that we have never seen before. In this context the structure of our economy will be based on knowledge. Institutions, particularly education institutes dealing with knowledge creation, exploitation, dissemination and reproduction have become the grounds of knowledge based society.

Picture 1: Interactions in knowledge economy



Source: Own construction.

Today the role and task of high education institutions are re-evaluating among Europe, therefore new approaches will appear in economic and social roles and projects. Universities make a fundamental contribution to reproduction and adaption of human resources, so their importance is growing among

regional actors. The part of high education institutes in support of regional governance is widely respected. (Forman, 2006.)

Education, as an important strategic resource is a key factor in knowledge economy and human capital leads to achieve economic success. Therefore the pressure increases on regions in order to become knowledge based communities. They focus on continuous development, new improvement, corporate learning and knowledge transfer and support regional development and well-being. The higher education institutions facilitate the development of their region, attract students and lecturers to their area, enlarge the human capital and establish workplaces. In the economy enlarges the importance of collaboration of society, universities and industry. We are living in network-oriented society, where development depends on cooperation skills. The criteria of improvement were earlier the specialization in research and education. Instead of the previous approach, today enhances the importance of evolving and maintaining relationships through communication and cooperation. This allows institutions to solve a problem in different approach with various competences. There is a change in technical and social paradigm: ideas, conceptions and solutions substitute the focus on the production.

Investigating the cooperation of industry and education there are three main types of relationship. The collaboration of the two participants and their combination based on:

1. Connection between products / services and achievements: The benefit of the common projects results from the combination of company's services and university education and research activities. The typical example is, when the university is a strategic partner or a sub-conductor of a company, which provides products or services for consumers.

2. Connection between resources: In this case the partners find out a good opportunity of sharing employees, resources and finances in common R&D projects.

3. Connection between resources and products / services: For example the owners or employees, as a life-long learning activity, train themselves at the university and the high education institute asks them to give courses as a part-time job. (Hansen – Pedersen, 2008).

Interdisciplinarism has a growing importance today because a fast improvement could be reachable in this way. This challenge represents not only the industrial sector, but also students. The qualification of students for multidisciplinary task is a significant goal and the most important tools are research projects and team jobs. (Tamándl, 2011)

The significance of cross-culture challenges enhance. In order to organize inter-culture conferences, researches we need a common language, the most frequent is the English. However the inter-cultural work may set back by cultural and other misunderstandings.

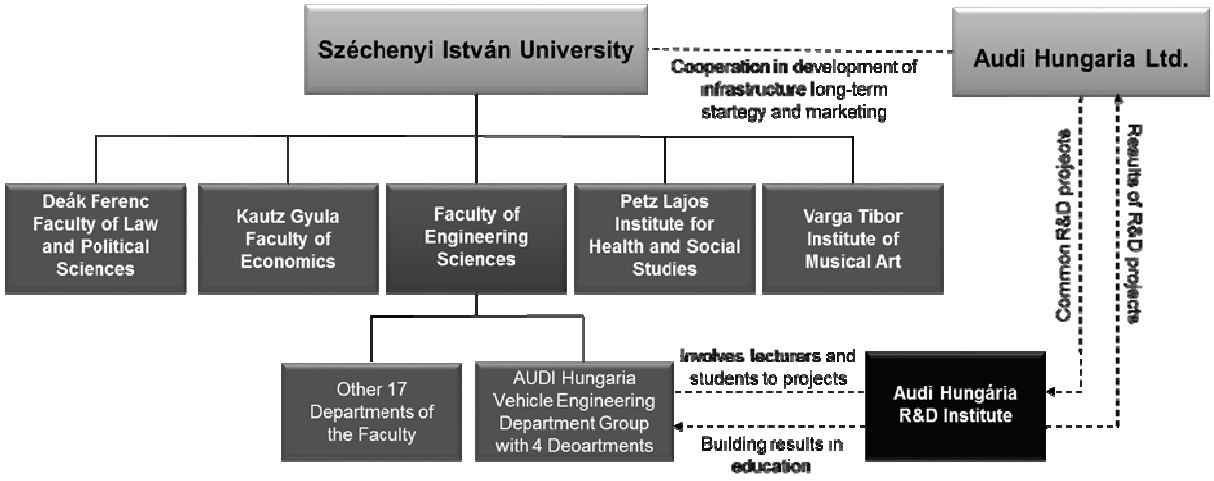
2. PURPOSES OF THE COOPERATION

The remarkable international companies, which operating in automotive or other vehicle industry, expect high qualifications about employees. The continuous development of the quality of education is necessary, because a company, which determines their region's economic development, could have a special demand of labour. It is important to guarantee the synergies between companies' expectations and the provided education of universities (first of all by engineering area). Involving business professionals with high level of practical experiences is a substantial goal. Automotive ventures apply the most modern technological knowledge and techniques, so it would be necessary to share this knowledge not only with students, but also with lecturers. They should involve professionals and by company working, high experienced engineers in the education and researches. Another momentous aim is the utilization of universities' and companies' modern infrastructure in the education and common researches. In accordance with the other goals, the introduction of practical education is the most important part of the cooperation. There are a wide range of advantages among this collaboration. First of all, educational development based on business expectation is implemented and the laboratory infrastructures are developed. The qualification will become more practical and corporate experiences will be applied in education. The long term R&D based cooperation has become the main driving force of the region's economic development. In addition, there are financial benefits of this collaboration, due to the common funding and fund-raising help support the university.

3. ASPECTS AND METHODS OF THE COLLABORATION

The collaboration consist of three important parts: practical oriented education, infrastructural development, R&D researches and common funding projects. Széchenyi István University has accomplished the most intensive cooperation with the most significant producer in Hungary, the remarkable large company in the region, Audi Hungaria Motor Ltd. However education and R&D projects involve other participants of vehicle industry. They have elaborated new qualification structures during the projects. This achievement could be a good precedent for other high education institutions in order to collaborate with regional industrial actors. This paper presents the details of cooperation among Széchenyi University.

Picture 2: Organogram of the cooperation between Széchenyi University and Audi



Source: Own construction.

3.1. Practical oriented education

On the one hand, high education has increased the level of practical oriented, business expectation based qualifications and education structures in order to be correspondent for corporate requirements. Universities will be more competitive, if they perform the labour market demand. Organizing a dual qualification system and providing its operational framework imply good opportunity to enhance the competitiveness Dual qualification means that students spend a part of their education time (for example the last year) for work for a company and parallel for taking some of their lectures. Both students and employers take advantages from this dual system. Companies can train their future employees, students receive relevant practical work experiences and after the trainee job. Ventures often hire them. Companies certainly employ self-trained professionals because they know them and their skills. Beside the dual qualification system, universities and companies offer trainee positions for students. This is important, because many students have to working as a trainee as a requirement for their qualification thus will be able to increase their chance for a full time position. Universities involve business professionals in education. The cooperation is grounded by projects for students and consultant work for degree thesis, for the Scientific Students' Associations Conference. Companies provide consultants, supervisors for writing degree thesis and offer topics for thesis and can help students. Ventures should motivate employees for supervisor work, for example they can acknowledge supervising as a job task.

The University and Audi have established together the Audi Hungaria Vehicle Engineering Department Group. It considers of the following four departments: Department of Materials Science and Technology, Department of Vehicle Manufacturing, Department of Internal Combustion Engines and Department of Whole Vehicle Development. 2204 Students chose at least one lecture of the provided 130 in the second semester of the academic year 2013-14. Audi takes part not only in professional

assistance, but also in the finances of operation. This company engages in support of infrastructural development, establishing of laboratories or purchasing of equipment.

3.2. Infrastructural development, R&D researches and common funding projects

On the other hand, common infrastructural development is a key factor of the cooperation and leads to long term, R&D based collaboration and research. In pursuance of projects, students and lecturers will know the corporate culture and the project based operation. It is important to define the financial issues about common founded departments (laboratories, institutions, research organizations). Companies should take a part of financing these common departments wholly or partly. They can support financial other departments of education institutions. The salary of the educational involved professionals should belong to the companies as far as possible. Ventures can support infrastructural development and donate or buy education tools, like laboratory instruments, laptops, projectors, technologies and software. Additionally, common R&D projects and commissions enlarge utilization of infrastructure and human resources. It is necessary to clarify financial problems in order to accomplish the above described tasks and purposes.

The university and the company established together the Audi Hungaria Institution to launch common R&D projects. The Volkswagen Concern provides the most of the cooperating partners, but the university maintains common researches with other automotive companies. The projects have required setting up a new management structure to guarantee the operation as a nonprofit institute, to involve industrial research experienced professionals and to give an opportunity for lecturer and students to joining. Furthermore they facilitate the purchases and finances for projects, so autocratic procurement process would not be necessary. (Rechnitzer, 2011)

3.3. Student organizations and projects

Practical-oriented engineer training is a major part of education; industrial actors take part too from qualification of students. During this process the two spheres, high education institutes and companies enjoy the benefits of cooperation. They can learn from each other, so the innovation and competitiveness improve and effect positively on productivity and employment.

Student organizations and teams play an important role at the university. There are two main initiatives of automotive scope. The SZEnergy Team builds alternative-powered vehicles for Shell Eco Marathon race series. The SZEngine Team develops an engine for Formula Student competition. For students and lecturers these challenges give an opportunity to apply the theoretical knowledge in practice, to improve skills, to handle corporate problems. This means to manage a complete corporate designed project in teams of 20-30 people. According to the team size, participants experience organization and leading. Students can manage a complex project they meet at a company. Beside the practical experience they get a qualification in teamwork, communication, conflict-management, time-management, negotiation too. In addition, students can meet with the top of the automotive industrials. Student projects cannot substitute the traditional education, although they can supplement it.

4. CONCLUSION

High education is the main basis of economic and social development and determines the regional development today. Therefore institutions have a substantial role in regional economy. The suitable qualified labour force, the R&D potential and improvements assist to establish new ventures and the prosperity of local industry and economy that leads to the increasing labour demand.

The suitable training structure at the university results to good employing opportunities for graduated students in the region. It makes to attract the institution too. The more efficient cooperation among university and local government enables to gain remarkable development projects and resources. The main purposes of collaborative projects with the regional automotive companies are the followings:

1. It gives a good opportunity for students to gain experiences in industrial projects.
2. It provides actual research topics for lecturers and researches.
3. It can create opportunities for efficient exploitation of human resources and infrastructure at the university.
4. Projects can enhance the salaries of employees

Key factors of successful strategy could be regional embedded partnership, more competitive education and better marketing communication.

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