

INTERACTION OF THE HIGHER EDUCATION AND THE CORPORATE SECTOR

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Abstract: Higher education institutions are facing serious challenges all over Europe. In addition to the rate of unemployment, lack of professionals and the decreasing number of young generations the expected quality of competitive online presence such as websites and the content of knowledge have also changed. These challenges have a greater effect on post-socialist countries since it is completely new to them that educational institutions are players on the open market and are competitors. Our research sets out to examine the economic and educational policy background in Hungary and Romania for the past 10 years, which might have influenced the functioning of universities, financing research and development as well as relationships between higher education institutions and private companies. Nowadays people want to acquire practical knowledge and courses and trainings are also trying to be more practical in nature. Using in-depth interviews the objective of the research was on the one hand, to find out whether universities are trying to develop relationships with companies and if so, in which fields; on the other hand, it tried to reveal if the directors of these companies consider these relationships to be successful and what mistakes or shortcomings they see. The opinions and answers given by company directors clearly confirm the existence of such efforts on behalf of universities. The results show that in the two countries examined, having different educational systems, companies have similar expectations towards universities and their teaching staff. However, responses given to these expectations differ in several aspects despite of the similar background of these two countries.

Key words: higher education, research and development, companies supporting education

Introduction

Since the regime change post-socialist countries have had greater access to higher education instruction, thus the proportion of those enrolled in higher education institutions has also significantly grown in the past 20 years. Groups that have previously been excluded can now access their preferred courses or majors and can obtain professional degrees in a variety of fields. The freedom of learning and teaching has become a reality and with the EU's initiative a unified educational system has been created. This has led to the discovery of the need to have a harmonized educational and research approach. Furthermore, expectations towards quality development in higher education have also grown.

In addition to the positive effects of the changes in higher education, institutions had to face financing problems due to the introduction of the quota system and for this

reason their strategy had to be adjusted accordingly. As part of strategy, online presence also needs adjustments as there are notable differences of targeting “business, partners” groups on institutional websites (Losonczy, 2012). Therefore it is in the universities’ best interests to maintain good relationships with several companies whose operational profile matches those offered by the universities. However, this interest is not a one way street; this can be a fruitful collaboration for the companies, as well because they can obtain young and committed labour force with excellent results during their studies. On the other hand, according to Kolnhofer-Derecskei in today’s innovation-driven economy understanding how to generate great ideas is one of the most important managerial priorities. The main source of creativity is hidden in the heads of employees (Kolnhofer-Derecskei, 2016). During the 3+2 Bologna system students have the opportunity to spend six months practicing at a company where they can familiarize themselves with job market expectations and have the possibility to put their theoretical knowledge into practice.

The present study aims to explore how Romania and Hungary – who joined the EU in 2007 and 2004, respectively – are performing in this matter what the opportunities and difficulties are that universities have to endure in the context of the new system and the crossfire of continuous challenges. During the research company directors were asked to express their opinion regarding the advantages and disadvantages of their collaboration with universities.

In 2014 37803 research and development specialist were working in Hungary while in Romania there were 27600 (KSH, 2016). Comparing this number with the 2004 data, it can be seen that Hungary shows a 27% increase while Romania only 1% growth. However, if we examine these numbers by looking at the different sectors we get a different picture of the situation. In the higher education sector in 2014 there were 16000 researchers in Hungary and 15000 in Romania. Thus, compared to the 2004 data, in the case of Hungary this means a 16% drop and in Romania it represents a 32% growth. Of the total GDP, R&D expenditure in Hungary increased in all sectors including the corporate sector but we can observe a decline in the higher education sector. On the other hand, in Romania a small decline is noticeable in the corporate sector but there was growth in the higher education sector. Nevertheless, it is true that Hungary invested 3.5 times more than Romania (see Table 1).

	2004	2014
All sectors		
Hungary	0,86	1,37 ↑
Romania	0,38	0,38
Corporate sector		
Hungary	0,36	0,98 ↑
Romania	0,21	0,16 ↓
Higher education sector		
Hungary	0,21	0,19 ↓
Romania	0,04	0,06 ↑

Table 1 R&D expenditure¹

Source: KSH, 2016

¹ Values compared to GDP (R&D intensity)

The Hungarian context

Higher education

According to Clark (1998) entrepreneurial university is not the creation of the devil and it is not the road to hell from the perspective of academic values. On the contrary, he believes that it creates the perfect ground for the academic values to be enforced. Furthermore, the author also claims that entrepreneurial university is such an institution where each department and each staff member is an entrepreneur and they are not separate entities but work together to form a joint venture and create a community within the university.

The world around us is constantly and rapidly changing. Adjusting to this constant change is extremely difficult for an educational institution; however it is vital in order to offer competitive knowledge and degree for its students. We need to pay attention to the on-going technological development, the effects of globalization, demographic changes, changing social needs and the growing problems of declining energy resources. Globalization and the changing social needs force universities to build relationships with other universities and companies and fully take advantage of these opportunities.

The number of publications of Hungarian researchers exceeds the EU15 average (85%). However, at the same time, the R&D expenditures are at 40% of the EU average. Financial support of publication is only 47% of the EU average (Figure 1). Therefore, it can be stated that in spite of the unfavourable financial support those working in higher education still play an active role in research and they also try to make their research results available to the general public. The only question that remains is whether these scientific publications can be accessed by the corporate sector and if so, can they understand and make use of its results.

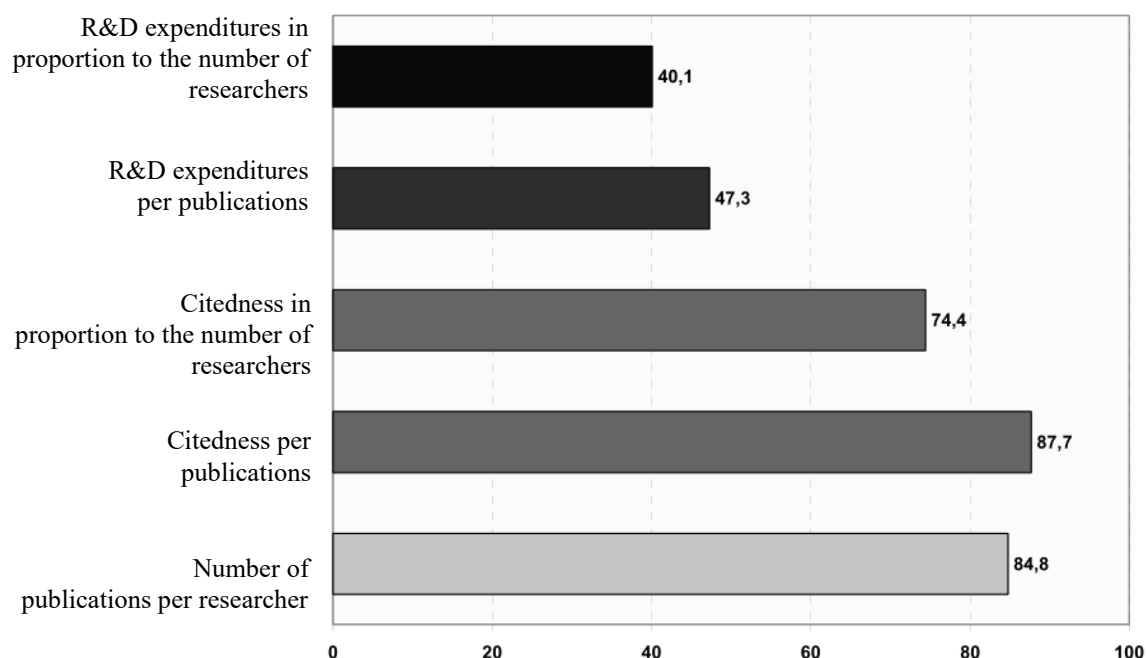


Figure 1 Hungarian scientific performance in international context, 2004-2006 (EU15=100)

Source: Havas and Nyíri, 2007

There are several factors that force universities to adapt. One of them is the need to find alternative financing for their research activity. Globalization has put an end to regional monopolies and they face competition from foreign universities. Nowadays universities are considered as incubators forced to practice science and technology-based business activities. Researchers are trying to adjust to this situation by widening their perspective leaving behind the narrow scientific fields and, instead, try to create interdisciplinary teams who are able to approach a certain field from a variety of angles. Change has also been brought about by the growing number of students (Figure 2), which demands an increased financial support. Therefore universities have been subjected to harsher governmental control and their organization has become more bureaucratic (Deés, 2011).

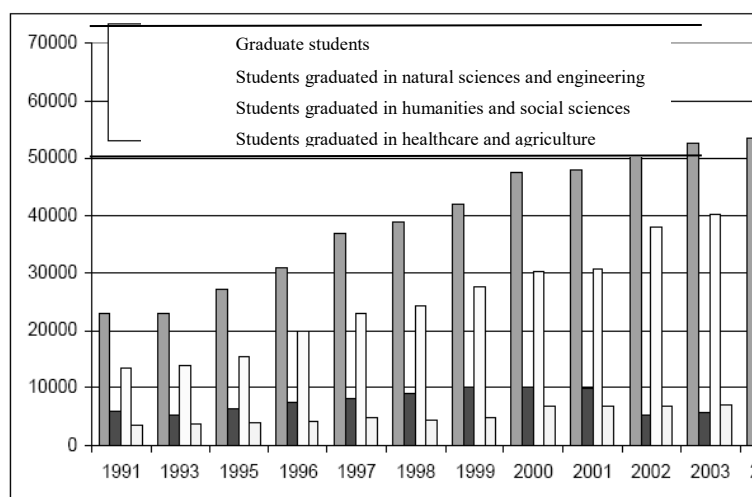


Figure 2 Number of graduate students between 1991 and 2003

Source: Deák, 2007

However, this tendency of growth seems to be decreasing (see Figure 3). Despite some predictions according to which in the next 2-3 years the number of university students will be slightly growing based on the increased number of high school students, it can be said that universities still need to make considerable efforts to recruit and retain students, maintain a high quality of education and support their developed institutional system.

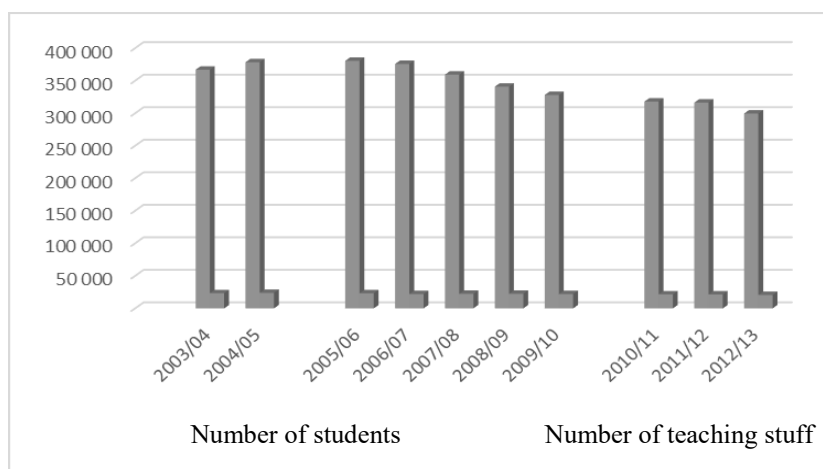


Figure 3 The number of students and teaching staff between 2003-2013

Source: Oktatási Hivatal, 2016 (authors' own elaboration)

One possible way of accomplishing this is to start so-called elite programmes which consist of special courses for exceptional students (Deés, 2011).

The SME sector

Throughout their development companies formed alliances in order to maintain and increase their competitiveness. These alliances can take different legal forms and the choice of one or the other legal form is defined by the nature of the cooperation and the partners' interests. Opportunities offered by universities are built on the institutions' structure and educational offers (economic, life sciences, engineering, natural sciences, law etc.).

So as to maintain a successful cooperation universities are continuously developing their course materials, organize apprenticeships and company-based trainings in order to satisfy the needs of the market. It is of utmost importance that university programmes consist of well-balanced theoretical and practical courses and that universities adopt an interdisciplinary approach. It would be incredibly useful that the academic and labour market sphere work together to create different courses and elaborate the curriculum as partners (Polónyi, 2011).

SMEs play an important role and make up a significant part of the Hungarian companies. It can clearly be seen that 60% of the added value is produced by the SME sector and this proportion is even higher in Central Hungary, close to 75% (Figure 4). Industrial joint ventures make up 8.1% of SMEs and due to their high productivity they produced one quarter of the gross added value. In all regions SMEs achieved greater results than their presence would indicate (Központi Statisztikai Hivatal, 2014).

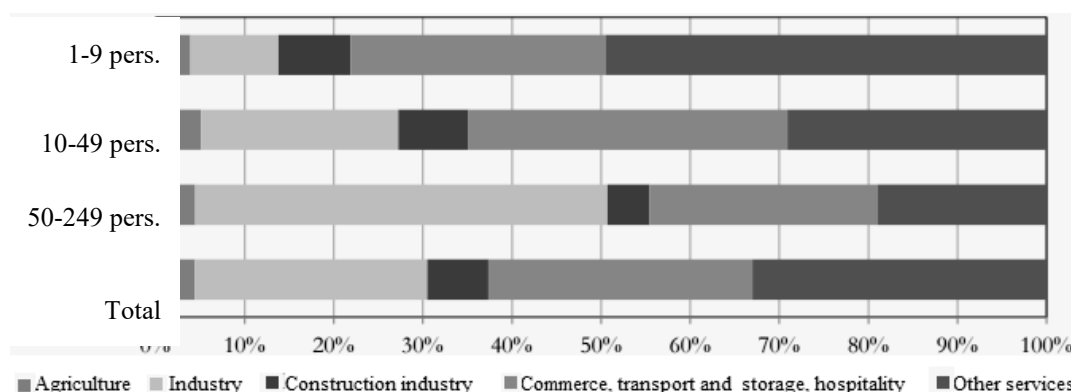


Figure 4 The breakdown of gross added value produced by SMEs in the aggregated economic sectors, 2012

Source: Központi Statisztikai Hivatal, 2014

On a national level 441 billion HUF was allocated to R&D in 2014, 5% more than in 2013. However in the country the number of research units was 2994, with 165 (5.2%) fewer than in 2013. Nevertheless, as was previously mentioned the number of researchers increased.

Companies offer more support for research and development. Since 2004 there has been a steady increase in the number of companies financing R&D (see Figure 5). At present technical sciences are the leaders in R&D activities. While basic research and applied research activities declined – basic research was 34.6% in 2004 and only 18.8% in 2014, applied research dropped from 30.8% in 2004 to 29.6% in 2014 – the proportion

of experimental developments has increased (34.6% in 2004 and 51.6% in 2014) (Statisztikai Tükör, 2015/71).

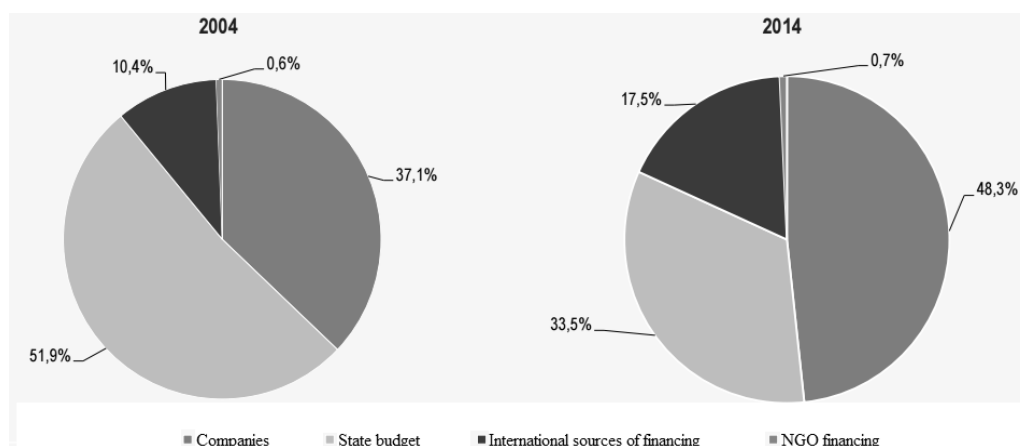


Figure 5 The structure of R&D financing

Source: Statisztikai Tükör, 2015/71

While in 2000-2001 only 4-5% of R&D expenditures in higher education derived from companies, this proportion rose to 11-13% in 2002-2006 and continued to increase year by year reaching a proportion of 15.5% in 2009. This is significantly higher than the EU27 average (6.8% in 2008). In addition, the largest proportion of Hungarian innovative companies consider information within the company group to be the most important (50% in 2006–2008) but there are high proportions of them who think that other companies they work with are also important (buyers: 39%, suppliers: 26%, competitors: 21%) (Table 1). This is in line with the international best practices (Havas, 2010/4).

Cooperation partners	Hungary	Romania
Other company within the company group	11.8	4.6
Suppliers (equipment, materials, fittings, software)	27.5	10.5
Buyers	18.6	8.2
Competitors (other companies within the sector)	13.1	4.8
Consultants, private R&D organizations	16.6	4.4
Higher education research institutes	18.7	5.1
Government research institutes	6.5	3
Total cooperation	41.3	13.8

Table 2 The frequency of cooperation among innovative companies in 9 EU member state, 2006–2008 (100 = all innovative companies)

Source: KSH, 2016

All in all, it can be said that both parties can profit from the cooperation, the strengthened relationship between higher education and the economic sector. Educational institutions can obtain new income (financing) thus the financial responsibility of governments would decrease – funds coming from the private sector can reduce the burden of government finance. At the same time, cooperation on a daily basis between higher education institutions and companies would enable universities to have a greater insight into the labour market expectations. Moreover, students could also benefit from such cooperation as universities could provide not only competitive, practical knowledge but also social capital and relationships that are essential when

starting a career. Therefore, it is important to involve interested and ambitious students into company based projects and research activities (Heti Válasz, 2012).

The Romanian context

Higher education

The higher education system in Romania follows the Bologna system. Except for the medical and engineering studies all BA programmes take 3 years to complete. It can be further continued for a Master's degree for two years after a separate admission procedure. Those who wish may continue their studies by enrolling for some postgraduate studies such as doctoral degrees, professional trainings which gain more and more importance with the spread of the lifelong learning perspective (Kovács, et al., 2009).

The problems and challenges of the Romanian higher education are very much in line with those present and already analysed in the western countries of Europe, more specifically the rise of mass higher education, poorer quality of education which is even worsened by the quota system or the normative per capita financing. With a slight exaggeration it can be said that the previous, general level of baccalaureate exam is replaced by the BA level degree (Tonk, 2012). For the reasons mentioned above and due to the oversupply universities are forced to enter into competition for their students as players on an open market. Romanian universities are only beginning to realize that they also have to compete for the employers because university diplomas issued by universities will become competitive only if students can successfully obtain a position on the job market.

In Romania at present there are 48 public universities, 7 military institutions of higher education, 37 accredited private universities and 10 institutions of higher education with temporary authorization to function. Looking at the number of undergraduate students a gradual decrease can be observed. While the number of enrolled students exceeded 650 thousand (650 247) in January 2008, by 2014 it dropped to 460 thousand (461 582). The reasons are manifold. On the one hand, there is the demographic decline, the economic crisis and the difficulties faced in the labour market; on the other hand, there is the promotion and development of vocational trainings (edu.ro, 2016). Figure 4 below shows the number of first-year, enrolled students between 2007 and 2014. Based on these numbers it can be stated that the expansion phase, i.e. growth has ended and there is a decreasing tendency. The number of undergraduates enrolled is continuously falling, thus universities are facing more and more challenges – they have to compete for the students. In fact, the number of students has become a matter of sustainability and existence.

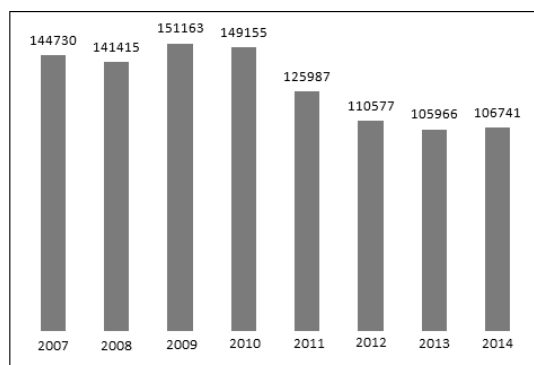


Figure 6 The number of students enrolled on BA education between 2007-2014

Source: edu.ro, 2016 (author's own research)

The SME sector

After Romania's accession to the EU so-called development regions were created (North East region, South East region, South Muntenia region, South West Oltenia region, West region, North West region, Central region, Bucharest-Ilfov region) and there is a Regional Development Agency in each region which analyses the region's economic and social situations and on the basis of the results they elaborate regional development plans. (aippimm.ro, 2015)

In 2015 Romania had three times fewer SMEs than the European Union average. It is a fundamental goal to increase the number of SMEs by 40% till the end of the 2020 financing cycle (Bozán, 2015).

Name	No. of employees	Maximum turnover RON/ year
Micro-enterprise	0-9	3 million
Small business	10-49	25 million
Medium business	50-249	50 million

Table 3 Types of SMEs in Romania

Source: Bozán, 2015

In order to promote the development of the SME sector the government tries to implement the following support systems: creating favourable financial environment for SMEs (e.g. advantageous conditions of loans), measures to improve competitiveness (e.g. financing innovative clusters), developing innovative capacity (national database, financing the development of innovative strategies) transforming the educational structure (transforming professional trainings in vocational schools, supporting vocational schools, supporting the relationship between universities and SMEs, creating paid internship programs).

Higher education and the SME sector

The cooperation between higher education institutions and SMEs can be mutually beneficial, yielding valuable benefits. One of the biggest challenges that universities are facing today is that they are unable to provide practical knowledge to their students while on the labour market companies are looking for experienced workforce. SMEs often cannot afford to hire a full-time employee but they have a lot of tasks which might fit for university students who could help with their theoretical knowledge, different perspectives and could be an efficient solution to the task at hand.

In the previous EU financing cycle the Sectorial Operational Programme Human Resources Development offered possibilities for financing cooperation between universities and SMEs (e.g. several innovative programmes, internship opportunities).

Innovative initiatives of Romanian SMEs lag far behind the EU average. Figure 7 shows how many SMEs were considered innovative in nature in 2014.

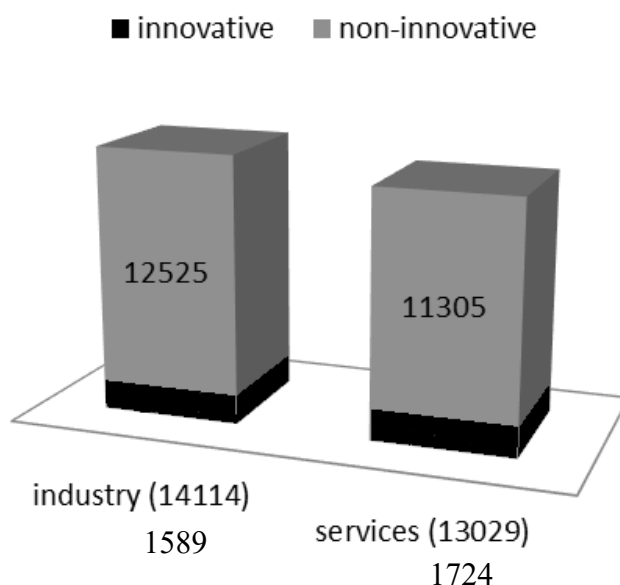


Figure 7 The proportion of innovative SMEs

Source: insse.ro – The number of SMEs (own elaboration)

In April 2014 the Romanian national R&D strategy was finalized. It stated that special attention was given to those R&D projects in the SME sector which are based on cooperation with higher education institutions. Furthermore, the inclusion of PhD students into practical research will be a top priority as well as creating temporary research positions.

The allocation of the funds in order to implement the above strategies is presented in Table 4.

	2014	2015	2016	2017	2018	2019	2020
% of GDP	0,41	0,56	0,57	0,63	0,72	0,83	0,97
Sum	2 730 911	3 870 244	4 176 023	4 846 341	5 670 831	6 684 955	7 932 327

Table 4 The allocation of funds for the implementation of the Romanian national R&D strategy between 2014 and 2020

Source: Ministry of Education (authors' own elaboration)

Analysing in-depth interviews

The present study is exploratory in nature; therefore structured interviews could not serve the purpose of the research. In-depth interviews have an informal character. They build upon the relationship between the interviewer and the interviewee. The researchers guide the conversation in order to prevent the interviewee from diverting too much from the topic but the conversation itself is informal and offers a lot of possibilities to explore new perspectives. The analysis of such interviews is strictly qualitative.

Using the above methodology interviews were conducted with 9 Hungarian and 8 Romanian entrepreneurs. Expert interviews contribute to explore related competences and enable a better insight into the topic (Kelemenné, 2014). They were asked to speak about their experience related to their relationship and cooperation with universities.

The main points of discussion were the following:

- ◆ What are the main activities of the company?
- ◆ What innovative solutions have been implemented in the past few years in order to improve the company?
- ◆ What are the entrepreneur's opinions and experience regarding university students who worked at their company as interns?
- ◆ What type of cooperation do companies have with universities?
- ◆ What are the advantages and disadvantages of cooperation with universities?
- ◆ What do entrepreneurs think about the ways universities could help them? What types of cooperation do they consider to be fruitful for both sides?

Interviews were conducted with the directors of 8 Transylvanian small businesses who have a relationship with universities either through cooperation with colleges for advanced studies or through internships programs. Interviews were conducted with the director of an online marketing consulting company, an accounting firm, an event planning company, a shading technology company and some trade firms. The nine Hungarian companies contacted include some software development company, a food processing company, a cluster development company and an automobile manufacturer. All three businesses collaborate with universities to offer practical knowledge for students and they also provide guest speakers to increase the quality of higher education. Company directors claim that their cooperation with higher education institutions is useful for them and this type collaboration fosters new ideas and perspectives that would not have occurred otherwise. All three Romanian companies have said that they are fully taking advantage of the internship programme. In Romania the majority of higher education programmes require students to complete a three-week long mandatory internship as part of their undergraduate studies. All respondents agree that this time interval is not enough not even for a future job application. Students do not have the possibility to fully understand the company's activities as well as to come up with new ideas and changes. Therefore, companies recommend students to commit their entire summer (2-3 months) to the internship. Companies expect students to come up with new ideas, innovative solutions and they expect universities to provide students with success stories, best practices and new ideas.

We conducted semi-structured interviews with two company directors who had not had any previous contract or cooperation with any university although they would like to engage in such activities. One of the directors mentioned that it would be a good idea if company directors and the representatives of higher education institutions would have a round table discussion where they could share and discuss their expectations. Thus, universities would know what type of knowledge and competences students need to be successful on the job market and find a job as soon as possible. The other company director complained about the fact that universities show little interest in how the students perform on the labour market and he believes that universities do not update their subject materials or their teaching methods in a proper way. For a concrete example, he mentioned students' little knowledge in foreign languages and their lack of Romanian language knowledge although most of the business activities are conducted in the state language – that is Romanian. The company directors were not satisfied with

fresh graduates' attitude towards work and their way of performing the job – these young people show difficulties in working in a team and they fail to recognize the situations which require immediate reaction or response.

Analysing companies' reach and the complexity of their cooperation with higher education institutions we arrived at the conclusion that in case of both Hungarian and Romanian companies a greater reach means a greater complexity of cooperation. SMEs do not see the benefits of cooperation with universities and therefore they do not take advantage of them. On the contrary, companies with international reach consciously exploit the possibilities of joint research, internships and guest speakers. Such companies outsource smaller tasks to students involving them in the company's activities while still at university.

Two of the most commonly used forms of cooperation are inviting guest speakers or on-site visits to the company's headquarter. Both are very useful for university students as practical business presentations and real world examples complement students' theoretical knowledge. On-site company visits provide an insight into day-to-day operations of a company. Students can learn about the equipment used, task delegations, therefore helping them to prepare for their future career. Joint research projects are rare but would be beneficial for both the corporate sector and universities alike. University employees have a greater understanding of the research methodology while company executives have more practical experience and therefore can suggest research questions and topics based on their insight and experience.

Hungarian companies also have positive opinion about their collaboration with universities, too. In Hungary most BSc programmes include a mandatory full semester-long internship during which students gain a deeper insight into the company's operations and the company in turn gets to know the students' qualities. According to the directors' statements university students are creative; they perform their tasks with responsibility and their work is mostly reliable and of good quality. The exceptional and hard-working students can prove themselves on the labour market with their innovative ideas, hard work and new perspectives.

The director of the Romanian marketing consulting company said that they run a joint project with the university students. The project involves developing online marketing plans for 2 companies. The project proved to be a success; the students were enthusiastic and worked very hard. The director also appreciated the fact that students were coordinated by a university teacher who facilitated communication and coordination of the work. Involving the students did not mean extra workload for him, he just had to keep in touch with the coordinator who guided and evaluated the students. This kind of project was considered to be especially useful because usually students do not take their work seriously if they lack supervision from part of the university.

Our respondents were asked to give 3 words each that first came to their mind about the advantages and disadvantages of cooperation among universities and the corporate sector. The answers given are shown in a word cloud. Word clouds are visual representations of the most frequently occurring words. Word clouds can be used for illustrating the frequency of certain words in a given text, the frequency of certain collocations or the number of subcategories within a category. Respondents mentioned a wide range of cooperation types. Almost all subjects mentioned presentations held by guest speakers, a lot of respondents spoke about on-site company visits and nearly half of the interviewees mentioned some kind of long term contractual cooperation and

partnership. All our respondents have been maintaining relationships with higher education institutions for several years.

These relationships were assessed as positive by all respondents. As far as advantages go the most commonly mentioned term was relationship building (Figure 8). Many key corporate actors believe that they can forge beneficial professional relationships during their cooperation with universities. They have the chance to get to know the executives of companies working in the same field as well as key university employees working in adjacent scientific fields. Information and awareness occupy second and third place among those most mentioned and in this particular case company executives brought as sample research carried out by universities.



Figure 8 The advantages of cooperation – word cloud

Source: authors' own elaboration

Our respondents also emphasized that keeping in touch with university teachers is pleasant and means a great opportunity especially with the scholars who have the ambition to increase their knowledge in a certain field and learn about the latest research results. Company executives are so encumbered by their day-to-day activities and tasks that they simply do not have time to read such information – the length and language of most scientific articles make it even harder to read and understand the results. Informal conversations seem to be more effective in engaging company directors sharing the most interesting and most important results and possibly give way to future implementation.

Finally, many of the respondents mentioned human resource development and keeping the fluctuation of the labour force under control, which has proven to be a significant challenge to many SMEs struggling with the lack of trained labour force and professionals.

The disadvantages mentioned by the respondents were spread across a wide range of topics. This is also visible in Figure 9 which clearly illustrates that the size of words shows very little difference. The most common objection was against the persistent presence of bureaucracy, and slow decisional processes. Another main disadvantage was that students working as interns quite often leave the company after graduation and thus the company loses the competitive edge they had hoped to gain by cooperating with the university in the first place.

Unfortunately, the term ‘back off’ appeared in a prominent position, the respondents explained that this happens when the university withdraws from certain agreements or decisions. They failed to give a clear explanation for this phenomenon.



Figure 9 Factors hindering cooperation – word cloud

Source: authors' own elaboration

As it can be seen many respondents stated that there are no drawbacks to collaboration with universities. This could be interpreted as a good sign on the condition that we know that dissatisfied ‘clients’, which in this case are the corporate sector, give voice to their objections and concerns on rare occasions, i.e. below 10% of all cases.

Conclusion

To conclude, it can be stated that cooperation between companies and universities in Romania has to be initiated and coordinated by universities. It is worth mentioning that companies are open and glad to take part in such cooperation and most of them are also willing to pay the students. In Hungary company professionals and experts feel they have to carry a significant administrative burden in exchange for the advantages of cooperation. The universities' bureaucratic system makes it difficult to make fast and flexible decisions. For this reason it is possible for the common project to fail or for it to be cancelled. “Universities can make their students familiar with basic concepts but they can not deliver the knowledge which shall be implemented in on-the-job contexts. Post-experiential education is not - as it can not be - ‘knowing-oriented’, thus there is a gap between the ‘know how’ (concepts brought from the university) and ‘know when (on-the-job context in a corporation). The problem is that we do not know how to bridge the gap between the ‘know how’ and the ‘know when’” (Szoboszlai, et al., 2014).

The discussion with company directors as well as the researchers' own teaching experience reveals that in order for students to be successful on the labour market it is

necessary and vital to gain practical knowledge during their undergraduate studies. The Romanian legal framework provides little opportunity to make this possible, therefore universities have to invest time and effort to initiate and organize joint projects with several companies in order to involve students.

In Hungary the half-year mandatory internship programme provides a good opportunity for students to gather experience for their professional development and future job seeking, as well.

Such joint projects of companies and universities have to be coordinated by university teachers in cooperation with company directors. Students have a lot to gain from such successful projects. Company directors are open to cooperation and they welcome new ideas from the universities and consider them useful. However, they complain about the huge administrative burden involved. Regarding the financial aspect of such joint projects company directors have different opinions. According to the director of the event planning company students should not be paid for the work they do during the internship program. However, the directors of the other two Romanian companies believe that students would take their work more seriously if they received some minimal compensation.

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