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The role of inter-university cooperation in the knowledge society

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Inter-university cooperation is a source of economic growth and competitiveness in all knowledge societies. Our aim was to evaluate the scope, importance and applied forms of inter-university cooperation from the perspective of a small post-communist economy, the Czech Republic. This study is based on data obtained through a questionnaire survey among managers of higher education institutions (HEIs). The study shows that, with a few exceptions, all HEIs/faculties develop inter-university cooperation with workplaces from both the Czech Republic and abroad. More than half of the managers of HEIs/faculties consider this collaboration to be, at least, very significant. With all forms of cooperation, there is a higher percentage of their use by public and state HEIs in comparison to private HEIs. This cooperation plays a greater role from the point of view of HEIs/faculties of technical, scientific and medical specialization.

Keywords: inter-university cooperation, knowledge society, higher education institution, triple helix model.

Introduction

Universities (generally higher education institutions - HEIs) play a key role in knowledge economies. Their contribution to the development of knowledge potential, both in terms of quality of workforce and innovation, is crucial, as is their contribution to increasing the competitiveness and economic growth of the country. However, it is necessary to seek ways of improving quality and competitiveness. We examine the development of partnerships, cooperation and networking.

The issue of university partnership is discussed in particular from the perspective of partnerships with businesses, see e.g. in Bok (2005), D'Este and Perkmann (2011), Franco and Haase (2015), Harris (2007), Klofsten and Jones-Evans (2000), or Veteska and Sebkova (2010). However, universities can develop effective forms of cooperation not only with businesses or public institutions and non-profit organizations, but also with other universities, both at the national and international levels. In this paper, the phrase "inter-university

partnership" is used in a broad sense to include cooperation between higher education institutions including universities and HEIs that are not universities. At present, inter-university cooperation lies more or less at the edge of the scientific community's interest.

The need to develop inter-university partnerships and discuss topics related to this issue has been declared in various documents at EU and national levels. From the point of view of the EU, we must mention Communication from the Commission EUROPE 2020 - A Strategy for Smart, Sustainable and Inclusive Growth (European Commission 2010). The need to develop inter-university cooperation is also declared by a common initiative of the European Commission and OECD in the form of A Guiding Framework for Entrepreneurial Universities (European Commission and OECD 2012). It is also possible to mention the Council Conclusions on a Strategic Framework for European Cooperation in Education and Training (ET 2020) (Council of the European Union 2009). On the national level, we refer to the Long-Term Intention for the Area of HEIs for the Period of 2016-2020 (Ministry of Education CZ 2015).

Literature review

The issue of inter-university partnership and cooperation is mainly related to the creation and transfer of knowledge and the creation of innovation (Franco and Haase 2015; Jowi and Schoole 2017; Miller et al. 2016; Morresi et al. 2014; Rossi and Rosli 2014; Sutrisno and Pillay 2014). The triple helix model is an important theoretical tool for exploring this issue (Etzkowitz 2002; Etzkowitz 2008; Etzkowitz et al. 2007; Etzkowitz and Leydesdorff 1995; Leydesdorff 2000). The triple helix model is a globally recognized analytic tool that makes it possible to analyze the status of and motives for cooperation of three key actors: industry–university–government, that makes it possible to study organizational and institutional arrangement of partnerships and that has an ambition to formulate recommendations for improvements in their mutual cooperation (Blazek and Uhlir 2011). Etzkowitz (2002), the

creator of this model, identifies inter-university partnership as one of the possible levels of partnership monitored by the triple helix model.

The distinction between particular forms of inter-university cooperation is closely related to the currently accepted concept of three academic missions – teaching (the first mission), research (the second mission) and outreach/services to society (the third mission) (Laredo 2007; Montesinos et al. 2008).

In the field of teaching, inter-university cooperation can be realized in the form of lectures given by academics at partner universities or internships of students and academics at these universities (Dias 1992; Dolan 2008; Kurkela et al. 2009; Zabalegui et al. 2006), joint study programmes or disciplines (de Wit 2009; Van Damme 2001; Vasiu and Andone 2010), reciprocal external reviews of theses or participation in the provision of members of state examination commissions (Chan 2004; OECD 1999; Zolfaghari et al. 2009).

In the field of research, inter-university cooperation can be developed through the joint implementation of scientific projects (O'Brien 1995), through the sharing of technical equipment (Tetrevova and Vlckova 2018), consultations, joint conferences or the joint creation of scientific publications (Carey et al. 2006; Stokman 2011).

These areas of cooperation are logically interwoven with the third academic mission. Specific forms of inter-university cooperation in the form of outreach can be seen in cooperation in the use of free capacity of lecture halls, accommodation, and catering or leisure facilities (Tetrevova 2012; Tetrevova and Kostalova 2012).

Methodology

The aim of the study was to evaluate the scope, importance and applied forms of inter-university cooperation from the perspective of the Czech Republic. Primary data was obtained through a questionnaire survey. The core set was made up of all 72 HEIs (26 public, 2 state and 44 private) operating as of 1 June 2015 in the Czech Republic. Relevant managers of

these HEIs were approached. In particular, they were vice-deans of universities and vice-rectors of non-university HEIs, whose competence includes the issue of cooperation with external bodies.

Thus, 148 vice-deans of universities (143 vice-deans of public universities and 5 vice-deans of state universities) and 48 vice-rectors of non-university HEIs (44 vice-rectors of private HEIs and 4 vice-rectors of public HEIs) were approached via email. 76 completed questionnaires were obtained, i.e. a return of 39 percent. Primary data was processed using statistical software IBM SPSS Statistics. In particular, tools of descriptive statistics and inferential statistics were applied.

The results were first processed for the whole set and then the analysis of the differences was performed according to the monitored classification characteristics of HEIs/faculties. The differences between the approaches of HEIs/faculties funded mainly from public sources (i.e. public and state HEIs) and HEIs/faculties funded primarily from private sources (i.e. private HEIs) were analyzed. In addition, the different approaches of HEIs/faculties in terms of their branch specialization were analyzed. Due to the low representation in some groups of disciplines, the HEIs/faculties were grouped into three groups based on their branch affinity. In doing so, we used classification of academic disciplines designed by Biglan (1973) and modified by Kolb (1981). Group 1 comprised HEIs/faculties with a technical, scientific, and medical specialization. Group 2 comprised HEIs/faculties of economics and law. Group 3 comprised HEIs/faculties of humanities, arts, and pedagogy.

Scope and importance of inter-university cooperation

In the framework of the study, the overall scope and importance of cooperation between HEIs/faculties and the workplaces of other HEIs in the Czech Republic and abroad was first analyzed. The importance of cooperation was evaluated by the respondents on the seven-point

Likert scale. The results of the survey are shown in Table 1.

Table 1. Scope and importance of inter-university cooperation

It is clear from the survey that the management of HEIs/faculties operating in the Czech Republic is aware of the importance and benefits of inter-university cooperation. Most of the HEIs/faculties examined cooperate with other higher education workplaces, 97.4 percent with workplaces in the Czech Republic and 96.1 percent with workplaces abroad. More than half of respondents evaluate this cooperation as very or extremely important, see Table 2.

Table 2. Specification of evaluation of importance of inter-university cooperation

There was a statistically significant difference in the evaluation of the importance of inter-university cooperation from the perspective of differently funded HEIs/faculties (Table 3), as opposed to HEIs/faculties with different branch specialization (Table 4). Across all groups of branch specialization, inter-university cooperation is evaluated on average practically identically to public and state HEIs, as very important. On the other hand, in the case of private HEIs, this cooperation is evaluated by about 1 point lower as rather more important. A bigger difference is evident in the evaluation of cooperation with the workplaces of other HEIs from the Czech Republic. It can be concluded that, in the case of private HEIs, the potential risks associated with the development of cooperation with competing entities are perceived to a greater extent, as highlighted by Horta (2009) in connection with the construction of the "world class university". But the fact is that these risks are particularly evident at the national level and, to an increasing extent, at a time when the number of potential candidates for the study is declining as a result of demographic developments. Moreover, it can be deduced that, in case of public and state HEIs, partnership relationships

built for decades are deepened whose development is considered to be the traditional pattern of behaviour of these HEIs.

Table 3. Importance of inter-university cooperation – Differentiation according to the HEIs funding method

Table 4. Importance of inter-university cooperation – Differentiation according to the branch specialization of HEIs/faculties

Forms of inter-university cooperation in the field of education

Secondly, the structure of forms of cooperation developed by HEIs/faculties operating in the Czech Republic in the field of education was analyzed. Based on the literature review, 12 possible forms of cooperation (see Table 5) that could be developed by HEIs/faculties in the field of education were identified and subsequently inquired about.

The structure and extent in which the various forms of inter-university cooperation are developed by the HEIs/faculties operating in the Czech Republic in the field of education is shown in Table 5. Given the fact that significant differences are evident in terms of the way HEIs are funded compared to the branch specialization of HEIs/faculties, there is a specification according to this criterion.

Table 5. Forms of inter-university cooperation in the field of education – Specifications according to the HEIs funding method

It is clear from Table 5 that the forms of cooperation that HEIs/faculties operating in the Czech Republic are developing in the educational field can be divided into three groups according to their representation. The least represented (25.7 percent to 45.9 percent) is the group of forms of cooperation related to academic internships, whether from the sending or admitting HEIs/faculties in the Czech Republic. The possible reason for this may be the fact that these are forms of cooperation that are completely absent within the evaluation criteria of the National Accreditation Authority and the development of these forms of cooperation is not considered within the criteria of career growth of academics either. Moreover, in the case of

these forms of cooperation, the HEIs are at risk of losing the academics if they are "stolen" by the partner entity. This group also includes forms of cooperation in the form of creation of joint study programmes or disciplines with other HEIs/faculties from the Czech Republic and abroad. From the point of view of cooperation at the national level, the aforementioned risks of cooperation with competitors can be considered a possible reason for the low occurrence of this form of cooperation. From the point of view of cooperation at the international level, based on our experience, it can be assumed that the development of this form of cooperation is hindered by the administrative and time-consuming nature of such cooperation, but also the lack of experience and professional erudition, especially language skills, of academics working in a number of HEIs in the Czech Republic. Therefore, there is room for both the adoption of conceptual measures at the level of the Ministry of Education and the adoption of relevant changes at the level of individual HEIs and faculties.

The second group (ranging from 71.6 percent to 77 percent) consists of forms of cooperation involving reciprocal external reviews of theses, internships of academics from foreign HEIs and participation in providing members of state examination commissions. In all cases, these are activities that belong to the standard that confirms the quality of the educational process of the given HEIs/faculties, and they are therefore paid attention to at most HEIs/faculties.

The most represented forms of cooperation (ranging from 83.8 percent to 89.2 percent) are lectures by academics from other HEIs in the Czech Republic and at other HEIs in the Czech Republic, from foreign HEIs and at HEIs abroad and internships for academics at HEIs abroad. This group mainly includes forms of cooperation developed with foreign entities that increase the reputation of the given HEIs, both from the point of view of the applicants for study and the professional public, including the accreditation authority. Internships and lectures by academics at HEIs abroad also represent one of the major criteria

for academic career development and, at the same time, an interesting opportunity from the perspective of most academics.

For all forms of cooperation, there is a higher percentage of their use by public and state HEIs/faculties. The Chi-Square test has shown that the use of different forms of cooperation is influenced by the HEIs funding method in five forms of cooperation. Their significance values are highlighted in bold in Table 5.

The impact of the branch specialization on the differentiation of the utilized forms of cooperation was demonstrated only in cooperation through academic internships at HEIs abroad. There was a significantly higher share of the use of internships in Group 1 (96.7 percent) compared to Group 3 (72.7 percent). This confirms the fact that, in the case of HEIs/faculties of technical, scientific and medical specialization, the transfer of foreign know-how is essential, which is generally documented in the context of the cooperation of HEIs by Philpott et al. (2011).

Forms of inter-university cooperation in the field of research

Thirdly, the structure of forms of cooperation developed by HEIs/faculties operating in the Czech Republic in the field of research was analyzed. Based on the literature review, eight possible forms of cooperation (see Table 6) that HEIs/faculties could develop in this area were identified and subsequently inquired about.

The structure and extent of the different forms of inter-university cooperation developed by HEIs/faculties operating in the Czech Republic in the field of research is shown in Table 6. Given the fact that the statistically significant difference in the frequencies of the forms of cooperation developed was confirmed in only one form of cooperation, i.e. depending on the funding method of HEIs, specification according to this criterion is presented.

Table 6. Forms of inter-university cooperation in the field of research – Specifications according to the HEIs funding method

Table 6 clearly shows that the forms of cooperation that the HEIs/faculties are developing in the research area can be divided by their representation into two groups. The lowest representation (from 30.1 percent to 35.6 percent) is shown for the group covering forms of cooperation through joint use of the science and technology base with both foreign HEIs and other HEIs from the Czech Republic. These are forms of cooperation that could lead to an increase in the performance as well as in the efficiency of the research activities. The remaining forms of cooperation constitute the second group (ranging from 71.2 percent to 82.2 percent). It is worth mentioning the fact that, in all the forms of cooperation considered, there is always a slightly higher representation in the case of their development at the national level. It is clear from the foregoing that the role of foreign cooperation is still not fully appreciated in this area. Still, possible reasons may also include the lack of interest of foreign partners in cooperation with HEIs operating in a small post-communist country or the aforementioned insufficient language skills of academics and scientists working in some HEIs in the Czech Republic.

As is the case in the forms of cooperation in the educational field, all forms of cooperation in the research area also show a higher percentage of their use by public and state HEIs. The Chi-Square test has shown that the use of different forms of cooperation is influenced by the funding method of the HEIs only in the form of joint implementation of research projects with other HEIs from the Czech Republic. It is a traditional form of collaboration that has been developed for decades by public and state HEIs, so these HEIs have more experience with developing it. In addition, in most cases, private HEIs focus their attention on the first mission, i.e. the educational activities.

The impact of the branch specialization on the differentiation of the forms of cooperation utilized was not statistically proven. Nevertheless, in all cases, the highest

percentage of the forms of cooperation can be seen in Group 1. Even so, we can document more attention to the field of research from the viewpoint of technical, science and medicine-oriented HEIs/faculties.

Conclusion

The significance of HEIs cooperation within the triple helix, that is, inter alia, inter-university cooperation, is declared centrally in the Czech Republic in the Long-Term Intention for the Area of HEIs for the Period of 2016-2020. The HEIs partnership issues are discussed in two priority objectives: "Internalization" and "Relevance" (Ministry of Education CZ 2015). The priority objective of "Internalization" is to ensure a clear international character of HEIs' teaching and research. Specifically, the aim is to see HEIs involved not only in student and academic mobility programmes but also see them ensuring full integration of incoming students and visiting academics into the life of HEIs. The aim is also to intensify international contacts in research activities and consider the world context and foreign experience and documents (e.g. EU institutions or university associations) in the development of strategic documents. The priority objective of "Relevance" is to ensure that HEIs' activities reflect current social developments, the latest scientific knowledge and the needs of their partners. Specifically, HEIs need to be in close and mutual open contact with partners at local, national and international level. They ought to be in contact with graduates, employers, public administration, non-profit organizations as well as other HEIs and scientific institutions.

In order to achieve these objectives, the Ministry of Education uses mainly financial instruments, and this year it has also begun to use regulatory instruments. Regulatory instruments are the legislative provisions that lay down the conditions for the accreditation of study programmes of public and state as well as private HEIs. Accreditation standards include, for example, the requirement to teach subjects in foreign languages (in English in particular), include semesters reserved for foreign students' mobility in study programmes,

engage foreign academics in the teaching, engage academics and students in national and international research projects or create networks of relationships within the triple helix. Funds, especially those from the EU, are also used to support, for example, the development of communication and linguistic competencies of academics, the creation and implementation of joint degrees, summer schools and workshops. Financial instruments play a special role from the point of view of public and state HEIs whose allowance for their activities depends, inter alia, on the extent of international mobilities or the number of foreign teachers.

The presented study shows that the management of HEIs/faculties operating in the Czech Republic is aware of the role of cooperation in today's knowledge society. Almost all HEIs/faculties thus develop cooperation with other HEIs, both from the Czech Republic and abroad. Yet, more than half of the managers of HEIs/faculties consider this collaboration to be very important at least. It is considered more important from the perspective of public and state HEIs compared to private HEIs.

In the field of education, one of the most developed forms of cooperation covers lectures by academics, both from foreign HEIs and at HEIs abroad, and from other HEIs in the Czech Republic and at other HEIs in the Czech Republic, and also internships for academics at HEIs abroad. In the field of research, the three most developed forms of participation are joint implementation of research projects with other HEIs from the Czech Republic, joint organization of conferences and workshops with other HEIs from the Czech Republic and participation in creating publications with other HEIs from the Czech Republic. In all forms of cooperation, there is a higher percentage of their use by public and state HEIs/faculties than by private HEIs.

Managers of HEIs/faculties consider the transfer of knowledge, improved image and attractiveness of the HEI/faculty and improved employability of graduates in the labour market to be major benefits of the development of these forms of cooperation. In their view,

however, any wider development of cooperation is mainly hampered by the lack of financial resources and the workload of academics. Therefore, they consider a higher allocation of funds for this purpose from national public sources and from EU sources to be an effective way of developing cooperation (Tetrevova and Vlckova 2018). Another useful way of developing inter-university cooperation seem to be a joint portal proposed by the Ministry of Education for the presentation of HEIs, which should serve as a tool for sharing best practices.

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Table 1. Scope and importance of inter-university cooperation

Statistics		Collaboration with other HEIs' workplaces	
		From CZ	From abroad
Number of HEIs	Cooperating	74	73
	Not cooperating	2	1
	Missing	-	2
Total		76	76
<i>Importance evaluation mean</i>		<i>5.66</i>	<i>5.88</i>
<i>Importance evaluation median</i>		<i>6.00</i>	<i>6.00</i>

Table 2. Specification of evaluation of importance of inter-university cooperation

Evaluation of the importance of collaboration with the workplace of other HEIs	From CZ		From abroad	
	%	Cumulative %	%	Cumulative %
1 – Not important at all	0	0	0	0
2 – Not very important	2.7	2.7	1.4	1.4
3 – Rather less important	4.1	6.8	2.7	4.1
4 – Moderately important	10.8	17.6	9.6	13.7
5 – Rather more important	20.3	37.8	19.2	32.9
6 – Very important	31.1	68.9	27.4	60.3
7 – Extremely important	31.1	100.0	39.7	100.0

Table 3. Importance of inter-university cooperation – Differentiation according to the HEIs funding method

Cooperation with the HEIs workplaces	Public and state HEIs		Private HEIs		Kruskal-Wallis test		
	Median	Mean	Median	Mean	χ^2	df	Sig.*
In CZ	6.00	5.91	5.00	4.86	9.808	1	0.002
Abroad	6.00	6.02	6.00	5.43	4.411	1	0.036

* 2-sided significance

Table 4. Importance of inter-university cooperation – Differentiation according to the branch specialization of HEIs/faculties

Cooperation with the HEIs workplaces	Group 1		Group 2		Group 3		Kruskal-Wallis test		
	Median	Mean	Median	Mean	Median	Mean	χ^2	df	Sig.*
In CZ	6.00	5.78	6.00	5.73	5.00	5.57	0.883	2	0.643
Abroad	6.00	5.93	6.00	5.95	6.00	5.81	0.631	2	0.729

* 2-sided significance

Table 5. Forms of inter-university cooperation in the field of education – Specifications according to the HEIs funding method

Forms of Cooperation	Frequency %	Public and state HEIs	Private HEIs	%	Sig.*
Creation of joint study programmes or disciplines with other HEIs from the Czech Republic	Count % within	18 31.0%	1 6.3%	25.7	0.045
Internships of academics at other HEIs in the Czech Republic	Count % within	24 41.4%	3 18.8%	36.5	0.096
Internships of academics from other HEIs in the Czech Republic	Count % within	24 41.4%	4 25.0%	37.8	0.232
Creation of joint study programmes or disciplines with foreign HEIs	Count % within	29 50.0%	5 31.3%	45.9	0.183
Reciprocal external reviews of theses	Count % within	46 79.3%	7 43.8%	71.6	0.005
Internships for academics from foreign HEIs	Count % within	43 74.1%	10 62.5%	71.6	0.361
Participation in providing members of state examination commissions	Count % within	48 82.8%	9 56.3%	77.0	0.042
Lectures by academics from other HEIs in the Czech Republic	Count % within	51 87.9%	11 68.8%	83.8	0.065
Lectures by academics at other HEIs in the Czech Republic	Count % within	51 87.9%	13 81.3%	86.5	0.489
Lectures by academics from foreign HEIs	Count % within	53 91.4%	12 75.0%	87.8	0.076
Internships for academics at HEIs abroad	Count % within	54 93.1%	11 68.8%	87.8	0.008
Lectures by academics at HEIs abroad	Count % within	54 93.1%	12 75.0%	89.2	0.039
Total	Count	58	16	100	-

*Pearson χ^2 , Asymptotic Significance (2-sided)

Table 6. Forms of inter-university cooperation in the field of research – Specifications according to the HEIs funding method

Forms of Cooperation	Frequency %	Public and state HEIs	Private HEIs	%	Sig.*
Joint use of the science and technology base with foreign HEIs	Count % within	18 31.0%	4 26.7%	30.1	0.640
Joint use of the science and technology base with other HEIs from the Czech Republic	Count % within	23 39.7%	3 20.0%	35.6	0.121
Joint organization of conferences and workshops with foreign HEIs	Count % within	42 72.4%	10 66.7%	71.2	0.442
Participation in creating publications with foreign HEIs	Count % within	45 77.6%	9 60.0%	74.0	0.089
Joint implementation of research projects with foreign HEIs	Count % within	45 77.6%	11 73.3%	76.7	0.466
Participation in creating publications with other HEIs from the Czech Republic	Count % within	48 82.8%	10 66.7%	79.5	0.081
Joint organization of conferences and workshops with other HEIs from the Czech Republic	Count % within	47 81.0%	11 73.3%	79.5	0.291
Joint implementation of research projects with other HEIs from the Czech Republic	Count % within	51 87.9%	9 60.0%	82.2	0.004
Total	Count	58	15	100	-

*Pearson χ^2 , Asymptotic Significance (2-sided)