

## UNIVERSITY AND SPACE – IN SEARCH OF KNOWLEDGE PRODUCTION PLACES

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### University and space – in search of knowledge production places

The paper takes the issue of geography of knowledge related to the spatial context of knowledge production. These considerations are focused on the foundation of the university as a place, and an organization traditionally associated with the generation and transmission of knowledge. In this article we look at the historical, evolutionary and ontological references to the models of the university. This studies have been carried out in relation to the Central European context. The paper also presents empirical research based on case study methodology. The result of the research is an attempt to identify key factors and processes related to the production of knowledge in the context of the university. The article is a contribution to the scientific debate on the effectiveness of the processes of knowledge production in the spatial aspect.

**Key words:** geography of knowledge, university, university models, case study methodology, Charles University in Prague, Central Europe

### INTRODUCTION

From the point of view of geographical sciences but also in the interdisciplinary perspective one can accept an approach, that the production of knowledge always have their spatial context, they happen in a particular space: place, physical space, virtual space, cultural space, etc. It should be also noted that knowledge is one of the most important issues in the contemporary world. Each organization, understood as a social and institutional structure is based on knowledge, but a particular example of such is an organization aimed at the processes of production, creation and dissemination of knowledge in the literal sense – as an academic unit, an important issue in the contemporary world. Furthermore as pointed out by Sekelský and Rehák (2014, p. 118), “currently, colleges are no longer seen as institutions offering education, but also as a major player in local development”. Besides the need for research on the issue of institutional education and knowledge in geographic sciences is widely recognized (e.g. Lauko et al. 2011 and Lauko et al. 2013).

The aim of this article is to present a contribution to the interdisciplinary scientific discussion on the spatial aspects of the processes of knowledge production. The research topics in consideration are related to the belief that from the Middle Ages, the institution of the university is the main place of knowledge production, which especially concerns knowledge about the nature of basic research and theoretical research. At the same time the problem of universities as the places of knowledge production has many dimensions, related to the space factor. One important approach in this field is to identify the university as a factor for regional development as Rafaj and Rehák (2016, p. 26) noted that “the significance of universities lies in the concentration of human capital and economic activities in the close proximity”.

But in the case of this paper, the aim of the author, is to focus on two main spatial dimensions in the context of knowledge production: the dimension of space in the geographical distribution and the dimension of the space as an internal university space. Furthermore, the article assumes that the nature of knowledge is characterized by constructivist roots, based on historical and social conditions, and, therefore, an important theme for discussion is the evolutionary perspective. The author discusses the issues of historical evolution and evolution of university models as a specific space context for the knowledge production. Methodology applied in research and presented in this article is based on the theoretical study of scientific literature, historical research, comparative studies and empirical investigations of technical case study characteristics. The basic tool of empirical research was a narrative interview. In the case of empirical investigations The Charles University in Prague as the strongest (and one of the oldest) knowledge production center in Central and Eastern Europe is the “space” of the research<sup>1</sup>. The article, beyond the introduction and the summary, consists of a few sections. The section entitled “Localised Knowledge as a “transdisciplinary” field of study” regards the question of the constructivist perspective of knowledge. In the next section entitled “University in European Space” one may find the presentation of the university as a specific social institution within the field of Western Civilization. In the section entitled “Model of the University as a Model of Knowledge Production” the evolution of “university models” has been presented. The section entitled “Mapping Localized Knowledge Production at a University Level – Case Study” concerns the methodological assumptions of empirical investigation and the presentation of the main results of the research.

#### LOCALISED KNOWLEDGE AS A “TRANSDISCIPLINARY” FIELD OF STUDY

Investigation of knowledge processes and their conceptualization provides many difficulties, because these issues exceed the borders of individual disciplines of science, therefore obtaining an interdisciplinary character. Knowledge as a subject of research arises in such scientific fields as, for example, sociology, psychology, neuroscience, organizational studies. Geographical sciences, especially human geography and regional development theories have made a lot of important advances in the area of conceptualization of knowledge as a specific subject of study. It is important to mention such theories as regional social capital, knowledge spillover, proximities theories, territorial clusters etc. One should be aware of the fact that investigation of knowledge involves major restrictions related to the design of empirical investigations. For example, there is the need for the use of high quality research or for the creation of specific research methods, combining a quantitative research method with a qualitative one. Furthermore, specific knowledge taxonomies<sup>2</sup>, such as the presence of many kinds of knowledge, creates additional methodological and interpretation problems.

In this article we assume that one of the fundamental approaches or even meta-approaches to the knowledge analysis is the concept of constructivist knowledge. The main assumption of constructivism is the belief that the knowledge about the

<sup>1</sup> In Europe, the strongest academic centres related with the production of knowledge are located mainly in the Northern and Western Europe.

<sup>2</sup> Tacit knowledge, explicit knowledge, codified knowledge, individual and collective knowledge, etc.

world, including the knowledge and scientific investigations, is conditioned by culture and general social factors. Hence, knowledge can be regarded as something “constructed”, “produced” by the people, but never as something discovered by them. This peculiar knowledge production has a spatial nature, often historically and culturally conditioned. The issue of knowledge constructivism is a problem with a quite wide and multi-threaded range, undertaken by many of the most eminent scientists such as, for example, Simon (1969), Von Glasenfeld (1984), Piaget (1991) and Habermas (1999). A constructivist approach involves the opinion that “knowledge about the world (both, scientific and colloquial) is constructed or even produced in the process of social interaction” (Wendland 2011, p. 32). Constructivism also assumes an important role of symbolic communication and language, not as a reflection of the world, but as a “tool” of design, production of the knowledge (Wittgenstein 1997, p. 30). Constructivism proposes, therefore, moving away from the classic (Shannon 1948) transmission models of communication such as: sender – recipient. Through adopting the approach above, referring to the concept of “knowledge production” as the production of knowledge in the constructivist sense of meaning – the article presents theoretical and empirical research on universities as specific centers of knowledge creation.

#### UNIVERSITY IN EUROPEAN SPACE

As early Kant in 1798 noted that “Whoever it was that first hit on the notion of a university and proposed that a public institution of this kind be established, it was not a bad idea to handle the entire content of learning (really, the thinkers devoted to it) by mass production, so to speak – by a division of labor, so that for every branch of the sciences there would be a public teacher or professor appointed as its trustee, and all of these together would form a kind of learned community called a university” (Kant 1992, p. 23).

The perception of universities in the area of the Western Civilization has always been associated with giving these institutions a particular importance in the range of the knowledge production (Dmitrishin 2013). At the same time it should be noted that the special position of universities is related to their autonomy. Autonomy from the other elements of social and institutional systems. This situation has affected the perception of the university as specific “knowledge islands” – autonomous centres of knowledge production. The traditions of European universities usually come from the period of ancient civilization and founded by Plato’s Academy<sup>3</sup>. The Academy operation was based on a model, involving the creation of a common space for students and tutors, which fostered learning and knowledge exchange. Plato’s Academy is recognized as the first example of a teaching centre, leading “institutionalized” knowledge production. Classically, however, it is assumed that the beginning of universities as we know them is associated with the period of the Middle Ages, when in the XII and XIII centuries, the first European universities were created. It seems that their formation was related to the civilization changes of society, or rather changes of the medieval world institutions, that were more and more interested in knowledge. Particular importance in this process can be attributed to the development of the societies of medieval towns, where the

<sup>3</sup> The Academy survived for 900 years (from 387 BC to 529 AD), it taught philosophy, mathematics and natural sciences.

system of professional corporations (guilds, brotherhoods) was developed. At that time, the functioning education system (lat. studium particulare) was limited both geographically and from the point of view of teaching content. At the same time, the main aim of knowledge was primarily to meet local needs, that, from the point of view of the corporate structure of urban communities, had become insufficient. This new model of education (university) was based on the idea of making it possible to offer an education to students coming from outside of the local community (lat. studium generale). The main assumption of this educational model was universal content taught in Latin, usable throughout the whole contemporary Christian Europe territory. The geographical distribution of the first universities in Europe are shown on the following map (Fig. 1).

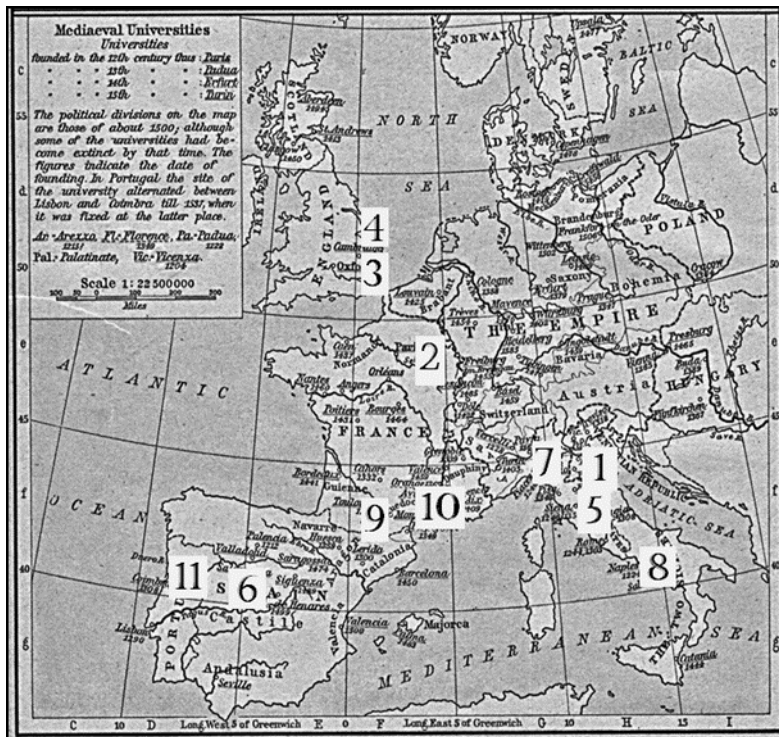


Fig.1 European universities in the XIII century

1 – Bologna (1088), 2 – Paris (1100), 3 – Oxford (1167), 4 – Cambridge (1209), 5 – Modena (1175), 6 – Salamanca (1218), 7 – Padua (1222), 8 – Naples (1224), 9 – Toulouse (1229), 10 – Montpellier (1289) and 11 – Coimbra (1290).

Source: adapted from: Mediaeval Universities (1923, p. 100).

In 1348, the first university in Central Europe, The Charles University in Prague (Universitas Carolina) was founded. In contrast to the first European universities in Bologna, Paris, and Oxford, which were founded by the religious environments, the university in Prague was established by the Golden Bull, issued by the King of Bohemia.

It should be noted that besides universities there were also a variety of church schools, for example bishop's schools, monastery schools and parish schools. Furthermore, of crucial importance in the development of the university community was the adoption of a specific institutional form with a corporation nature and specific powers and privileges (a monopoly on granting the academic degrees). What is important, the educational unit / university had to get their privileges in the first period of their development to the Reformation period from the church authorities and the Empire. At the same time there were two divisions among the university students; divisions into so-called "nations" (academic corporations, territorial corporations, usually four) and division into faculties due to the taught content and processes of degrees granting. The concept of the university in its deepest sense means a community of knowledge and a community of space for students and tutors (lat. *universitas magistrorum et scholarium*). Those educational units produced and transferred knowledge in a community, based on a student-master relationship (Daszkiewicz 2009) by using the most perfect communication tools at that time<sup>4</sup>. Furthermore, they represented real centers of knowledge production spreading. It is worth mentioning that the characteristic feature of universities as communities of knowledge production in the Middle Ages and the Renaissance was their cosmopolitanism. Prominent scholars of medieval Renaissance Europe were nomads<sup>5</sup>.

#### MODEL OF THE UNIVERSITY AS A MODEL OF KNOWLEDGE PRODUCTION

The first common model of the university, and thus the model of knowledge production was the Bologna educational model. It assumes that the key role is played by the students, usually wealthy, that employed in some way, tutors and the proposed curricula (Pedersen 1997). On the other hand, the universities in Paris, Oxford and Cambridge were based on the key role of the tutors / masters. Moreover, in contrast to Bologna, students were younger and did not come from the privileged classes<sup>6</sup> (Rothblatt 1997).

Starting from the twelfth century the universities of Oxford and Cambridge set up the model of the collegiate university (consisting of several semi-independent colleges), typical for the Anglo-Saxon and later the North American areas, later called the Oxbridge Model. The specific idea of this model was the *loco parentis*, which means that the main purpose was to educate students for their adult life (Rothblatt and Wittrock, eds. 1993). Until the XIX century, greater emphasis in the Oxbridge colleges was placed more on teaching activities<sup>7</sup> than on scientific research (Rothblatt and Wittrock, eds. 1993). Furthermore, the Oxbridge model was characterized by the elitism of studies and, in a sense, by isolation from the social

<sup>4</sup> The basic teaching techniques were lectures – *lectio*, disputations – *disputatio*, additional lectures – *lectio extraordinaria*.

<sup>5</sup> Thomas Aquinas, an excellent example of a prominent scholar (1225 – 1274), began his studies at the University of Naples, then he continued his education at the Universities of Cologne and Paris and, at the same time, he taught at the universities of Naples and Paris. Erasmus of Rotterdam (1469 – 1536) studied in the Netherlands, in Paris, Oxford and Cambridge. He taught at the University of Oxford and University of Cambridge, and at several Italian universities. He died in Basel, Switzerland.

<sup>6</sup> For example, the Sorbonne University was funded for several poor students by Robert de Sorbonne in about 1257. At the University of Paris in the XIII century more than 7,000 students studied there.

<sup>7</sup> For example, until 1980 many of the leading lecturers of Oxbridge had only a bachelor's degree and their academic advancement was based more on their real scientific papers than on formal levels of study.

system of given territory. Students and tutors were, in some way, locked in the university territory within its walls.

The new university model for the British territory appeared simultaneously with the establishment and development of the University of London. It was characterized by the geographical dispersion of buildings, spread in the “big” London and one did not intend to “close” the academic environment behind the medieval building walls. Simultaneously, from 1858 the London University was awarded a new statute, that allowed it to teach students from all over the world. Many students at the same time were able to study and work (Bell and Tight 1993). What is interesting is that the foundation of the University of London led to strong opposition of the Oxbridge environment, because the London model, in their opinion, violated the canons and traditions of the elite academic culture.

The French university system, which was a role model for medieval and renaissance Europe (especially the University of Paris), had been radically revolutionized as a result of the French Revolution. French universities were transformed into profiled universities, educating specialists in narrow fields of knowledge (Neave 1985). Simultaneously, the French model of the university is characterized by very bureaucratic and centralized structures with a strong role of state institutions. But the Humboldt University model, associated with the foundation (1910) and functioning of the University of Berlin (Matlovič et al. 2012), had the biggest impact on the contemporary shape of creation and knowledge transfer. The concept of this university was based on a systems approach and interpretation of scientific disciplines (Matlovič 2006) and the harmony between scientific research and teaching process; that is between the manufacturing process, the production of knowledge and processes of its spreading. Simultaneously, the process of learning, knowledge spreading itself was not intended to be the result of existing rules or knowledge canons, but rather to follow the current findings and the current state of knowledge in the individual disciplines. This concept also included ensuring the independence of the knowledge process, that is the blocking of external interventions (eg. national authorities), but also of internal influences (eg. university corporations). Nowadays, it is widely recognized that the the North American universities have the highest positions in the world. This situation is clearly reflected in the world rankings. It is also considered that the USA university system model was obviously based on the traditions of the English and Scottish universities. On the one hand, there are English patterns of elitism, reflected in academic fraternities and academic corporations, but on the other hand, there is a greater focus on the usability and practicality of knowledge at Scottish universities. In addition, one of the most characteristic features of the American model is the flexibility of the process of studying, openness to the external environment and very strong relationships with non-university communities, especially financial and economic corporation environments, resulting from cultural and historical conditions. American university culture has been built on the basis of the “New Englanders” experience and beliefs and was based mainly on the Protestant tradition, while the Catholic tradition was seen as a kind of antithesis of this approach (Marsden 1994). In the process of knowledge production and teaching one assumed a large amount of freedom of the research subjects and educational programs for students.

Nowadays the university as a centre of knowledge production and spreading is not an elite space available only for a few society members, it is a widely available place. Despite the fact that universities are among the oldest institutions in the area

of the Western Civilization, it turns out that the majority of European universities were created in the second half of the XX century.

## MAPPING LOCALISED KNOWLEDGE PRODUCTION AT UNIVERSITY LEVEL – CASE STUDY

### Background

Generally speaking, the position of the universities in Central Europe is relatively very poor. In fact, the only exception to this trend is the University in Prague. To make a proper analysis of the processes of knowledge production, one should refer to the institutional – administrative context. In the case of empirical investigations concerning the Charles University in Prague presented later in this article, one should take into account the context of the university environment in the Czech Republic. It seems that in this case the most important context of the analysis is the reform (Úřad vlády ČR 2013), that resulted in administrative pressure on the quality of the production of knowledge, expressed through the publication of research results in journals with Impact Factors (IF), and indexed in the Scopus database. The reform was about to change the financing system for research, associating it with specific bibliometric indicators converted into points, that, in turn, are recounted into concrete financial amounts<sup>8</sup> (Úřad vlády ČR 2013). The creation of a specific administrative context, favorable or even forcing the conditions of knowledge production, resulted in a significant increase of the efficiency of knowledge production in academic institutions of the Czech Republic. The effectiveness is expressed by the increase in the number of publications indexed in prestigious databases. However, it must be assumed that the administrative pressure itself could not be sufficient enough to ensure the conditions for increasing the efficiency of knowledge production. Therefore, it seems essential to investigate this phenomenon, based on empirical research. According to the aim of the research and the adopted methodology, one applied a research team, using qualitative techniques based on an organisation ethnography, to perform knowledge mapping processes.

### Research case

Charles University in Prague is the oldest university in Central Europe established by Charles IV in 1348. The university teaches about 50 thousand students representing one-sixth of all students in the Czech Republic. When talking about doctoral programmes there are more than 8 thousand students, about a third of the total number of doctoral students in the Czech Republic. The Academic Ranking of World Universities (Shanghai rankings) placed Charles University at 258th place, among the world's top 2% of universities and 100 top European universities (Shanghai Ranking Consultancy 2017). At the same time, Charles University is the most knowledge productive research institution in the Czech Republic (Research and Development Council 2015, p. 58).

<sup>8</sup> Each publication (IF, Scopus) receives the number of points from 10 to 305. 1 point is equal to, on average, 150 EUR. In the case of indexation in the Scopus database the amount is in the range of 110 to 370 EUR, and in the case of Thomson Reuters - indexed journals from 370 EUR to 1 100 EUR

### Applied methodology

According to the scientific basis which is the mapping of the knowledge processes in order to identify the main factors determining the effective production methodology one has adopted a case study methodology. The case study as a qualitative interpretive method appeared at the beginning of the twentieth century, as a tool for anthropological research. In its first phase of development, the case study was the main method of collecting data in anthropological research. Most often it has been used for systematic analysis and observation with the elements in participant observation Stake (1995). A very important stage for case study methodologies development was the development of field research methodology by the Chicago School of Sociologists (Bulmer 1984). After World War II the importance of qualitative methods was significantly marginalized as a result of the emergence and ascendancy of logical positivism, and the dominance of quantitative methods. This research is an intrinsic case study, which is essential to a study case itself. Exploration is conducted primarily with the intention of gaining knowledge about the uniqueness of the case, and then to generalize it to a broader context Yin (2003). The approach to this study is based on the social constructionist opinion, that knowledge underpins all behaviour patterns, and that action and social understandings are based on knowledge understood by members of an organization. Empirical studies at the Charles University were conducted in one of the units of the Faculty of Science during the three month period and they include analysis of source documentation, participating observations and analysis of artefacts. One of the key research techniques were narrative interviews conducted with representatives of the faculty, department, heads of research teams, representatives of academic staff and students of doctoral studies. The interviews were conducted in work or study places of each of the respondents in one of the units of the Faculty of Science.

### Outline of the research results

1) The main finding of the knowledge process mapping is the identification of the knowledge production process foundation on the functioning of informal social structures (research teams). The research teams operate independently from the administration and the authorities. Along with the formal organizational structure of the institution they form a “matrix” structure. This structure is characterized by the loss of direct administrative subordination while the simultaneous strengthening of subordination with an informal nature, extending “across” the formal structure.

2) The informal system of subordination is based on the power of authority resulting from the subjective assessment of individual team members. The team leader exercises informal authority, and remains, in the subjective belief of the team members, the natural leader of the group. At the same time the authority among the team members is a result of objectified assessments on the basis of the publications and competence acquisition of research projects financed by external sources.

3) Analysis of the knowledge production structure leads to the conclusion that one is dealing with the knowledge production of a constructivist nature or based on a process of social interaction. In this case, social interactions are associated with relationships within the research group. It should be also pointed out that the dominant space relationship is the relationship of the research team space. Individual members of one group maintain relationships with members of the other group to a



much lesser extent. The lowest importance must be attributed to the relationship between the members of the research group and the formal-administrative structures of power.

4) Described research also shows that new knowledge is created in a context space based on the interaction in a “master – student” relationship, which indicates the existence of the Humboldt University model. In addition, interactions in the research teams space perform the function of knowledge structuring and its spread through the concentration of activity on specific scientific fields of research related to the subject matter of the team’s work.

5) An important factor influencing the efficiency of the knowledge production process is the autonomy and openness of the teams. The teams create open systems, and their openness is presented by a strong tendency to use external knowledge, including practical knowledge. Another manifestation of acquiring external knowledge is knowledge acquisition based on contacts with foreign communities. These contacts are mainly based on the social interaction of group leaders with the representatives of foreign universities. This leads, on one hand, to gaining practical knowledge, and on the other hand, to using contextual knowledge, one derived from different scientific and cultural contexts.

6) Leading the specific mapping procedure of these processes one can ascertain that the research teams, somehow, crystallize information and knowledge production spaces. Simultaneously, the team space builds the self-identifying transmission, creates a specific “brand” recognized outside the team space, in the external environment. This process strengthens the identity of the teams and, at the same time, strengthens the specific space of the context that encourages production of knowledge.

## CONCLUSION

In reference to the purpose of this article, presenting research aimed at the identification of the processes of knowledge production with the example of a university, it is clear that the presented approach does not exhaust these topics. According to the initial assumption, the article is a small contribution to the scientific discussion in this area. It should be emphasized that the presented research has an interdisciplinary nature and differs from a classical cognitive approach, based on one scientific discipline. Nevertheless, the author hopes that this issue can be an interesting subject of discussion including a debate in the area of geographical sciences, especially in the field of human geography or specifically the “geography of knowledge.” In this case, the “geography of knowledge” includes research on a macro level that is focused on a mapping procedure of knowledge production in the physical space and on a micro level or in the geographical space of the place or university. Obviously, the article results indicate the need to analyze, not only the classical physical space where knowledge is created, but also the specific context space, conditioned by historical and cultural factors. Therefore, the most important finding of the presented research is to identify the key importance of the creation of knowledge based on the social interaction in the space of context or even a constructivist nature of knowledge production. The author also hopes to continue research in this area, especially in the area of comparative studies, for example, in the analysis of other “spaces” of knowledge production or the other “university spaces” in the countries of Central and Eastern Europe. This research programme

will enable a better generalization of the obtained results towards the creation of more universal epistemological conclusions.

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## UNIVERZITY A PRIESTOR – HEADANIE MIEST PRODUKCIE POZNATKOV

Cieľom článku bolo prispieť do interdisciplinárnej diskusie o priestorových aspektoch procesu produkcie poznatkov. Téma článku vychádza z toho, že univerzita ako inštitúcia sa už od stredoveku uplatňuje ako základné miesto produkcie poznatkov, najmä základných teoretických poznatkov. V štúdiu sa venuje pozornosť dvom hlavným priestorovým dimenziám v kontexte produkcie poznatkov: geografickému rozšíreniu univerzít a vnútornej priestorovej organizácii univerzít. Štúdia vychádza z konštruktivistického predpokladu charakteru poznatkov, ktorý sa opiera o historické a sociálne podmienosti. Dôležitým hľadiskom výskumu je tiež evolucionistická perspektíva. V štúdiu sú diskutované problémy historického vývoja modelov univerzít ako špecifických priestorových kontextov pre produkciu poznatkov. Empirická časť práce sa opiera o prípadovú štúdiu Karlovej univerzity v Prahe.

Výskum ukázal, že tento bádateľský problém sa stáva zaujímavou témou diskusií v rámci humánnej geografie, resp. jej subdisciplíny – geografie vedy. Geografia vedy pritom môže do tejto diskusie prispievať z makro- i mikro-perspektívy. V prvom prípade sa koncentruje na mapovanie vytvárania poznatkov v rámci fyzického priestoru (interuniverzitná perspektíva), v druhom prípade na tieto procesy v priestore univerzity (intrauniverzitná perspektíva). Najvýznamnejším výsledkom výskumu je identifikácia kľúčového významu produkcie poznatkov na báze sociálnych interakcií v kontexte priestoru, čiže konštruktivistického charakteru produkcie poznatkov. Ďalší výskum by sa mal zamerať na komparatívne analýzy v zmysle skúmania aj iných priestorov produkcie poznatkov, nielen univerzít. Takto orientovaný výskum by mohol priniesť väčšie možnosti generalizácie získaných poznatkov.

