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**EXAMINATION OF THE SECONDARY AND HIGHER EDUCATION
CATCHMENT AREA OF SZEGED FOCUSING ON THE ROLE OF VOJVODINA**

Dissertation (Ph.D.) theses

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I. Aim of the dissertation, literature review

In geographical and regional scientific studies, exploration of the center-catchment area relationships are examined from the first half of the 20th century. The aim of the studies is to explain the functional relations between settlements. According to the general definition of catchment area, it is the area which is regularly provided with urban services by the central function institutions of city (e.g hospital, school, administrative institutions) (BELUSZKY P. 1974). Exploration of the catchment area is possible by gravity model, by interviewing the users of the services of the center or by collecting data from the central function institutions.

In Hungarian geography, formation of the concept of catchment area can be traced to the period between the two world wars, when researches were related to the preparation of the Treaty of Trianon, and most of the studies concentrated on accessibility of towns and cities, using the methods of transport geography. The methods used for the impoundment based on were simple mathematical methods. In the socialist period, the majority of catchment area research served the scientific elaboration of bordering of economic districts. It is characteristic of the research of the era that due to the quantitative revolution in the international scientific life, in addition to the descriptive trait, an approach that explaining the spatial relationships and the application of the gravity model also appeared. In addition to transport geography researches, investigations have been covered to more and more central functions. The antecedents of Hungarian educational geography research can be traced to this period, when the impoundment of the educational catchment area was occurred in most catchment area examination (JANCSÓ T. - SZALKAI G. 2017). The catchment area of the various central functions was delimited by data such as passenger traffic data for labor flow; the commercial function with the place of origin of the products on the market (flow of goods) and customer turnover data; health catchment area with patient turnover data and the education catchment area with the students' place of residence. At the time of the regime change, Hungarian catchment area researches were forced back, however, later, with the expansion of databases and the development of informatics, it became possible to make wider and deeper, more complex catchment area examinations. This also provided an opportunity to expand the examined topics in educational geography researches. Within the Hungarian educational geography researches, investigations of the educational catchment area is characterized by the fact that the studies rather analyze the attractiveness of secondary and higher education institutions (NAGY Á. 2002), they are mostly descriptive and the extent of the catchment area is examined within the country. In

geographical research, in addition to delimiting the catchment area with statistical data, they don't pay enough attention to explore the causes, the real, unique motivations. School choice is examined in the literature of sociology of education, but it is more embedded into the issue of social structure and mobility (SCHUMANN R. 2009; GYŐRI Á. - CZAKÓ Á. 2017).

The determinants of educational catchment areas are secondary schools and higher education institutions, because they cause significant population movement among students. The population movement for study purposes generated by spatially different educational conditions is not only characteristic within the country, it also extends to areas beyond the borders of the country. Much less attention is paid to the connection between internal migration and education, although internal migration is more significant, than international migration (BERNARD, A. ET AL. 2018). In the case of student mobility within the country, we primarily analyze the demand and supply of secondary and higher education. Demand is determined by economic development, the individual's place in society, the parents' education, the student's social background and financial circumstances. The typical catchment area of Hungarian secondary education is the county (NUTS3 level in European classification), however, certain secondary schools with unique educational offer and better educational quality also attract students from other counties or regions. The most important reasons behind studying in other city than the place of residence are economic factors, students undertake to be away from their families for a more secure future (M. CSÁSZÁR ZS. 2004). The extent of the catchment area of Hungarian higher education institutions are influenced by qutoas, training offer, proximity of other institutions and the accessibility (NAGY A. 2015).

Not only the regional and national, but also the cross-border attractiveness became an important aspect in the study of the catchment area of educational institutions close to the border (JANCSÓ T. 2018). Hungarians from neighboring countries are also present in Hungarian educational institutions, among whom the geographical proximity, training offer and the quality of the institution's training are also determining factors in the examination of motivations. One of the essential components of the training offer is the possibility of studying in Hungarian, which is a crucial aspect for Hungarians from neighboring countries (PREGI L. 2018).

Majority of Hungarian students from neighboring countries, participating in public and higher education in Hungary, come from Romania and Serbia (more precisely Vojvodina). The migration of Hungarian students from Vojvodina to Hungary for study purposes appeared as early as the 1980s, but it became significant only after the eruption of the Yugoslav Wars (TÓTH P. P. 1997). This migration results in significant cross-border mobility,

the outcome of which can be settling in Hungary, returning to Vojvodina, or moving to a third country (RÉDEI M. 2009). However, research has pointed out that the majority of students from Vojvodina who graduate in Hungary did not return to Serbia, and nor did they want to (GÖDRI I. 2005). This lead a loss of qualified young people from Vovjodina, a phenomenon which has been termed "brain drain" (TAKÁCS ET AL. 2013). This is disadvantageous for Vojvodina, but it is a "brain gain" for the receiving country (CSANÁDY M. ET AL. 2008). Non-return after graduation also contributes to the decrease in the number of Hungarians in Vojvodina (PALUSEK E. – TROMBITÁS T. 2017), which endangers the long-term subsistence of the Hungarian community in Vojvodina as well as the subsistence of Hungarian-language education (TAKÁCS Z. 2012). The future of young Hungarians in Vojvodina is highly dependent on the development of economic and social processes in the region and throughout Serbia.

Compared to secondary schools, higher education student mobility has an international dimension and affects longer distances. Besides students from neighboring countries, citizens of other European countries and other continents are also present in Hungarian higher education institutions. The presence of international students in higher education institutions in Hungary was already representative in the 1970s (FEHÉRVÁRI A. ET AL. 2011). The change of regime gave another boost, but the accession to the European Union in 2004 and then to the Bologna system (from 2005) are accelerated the process (JANCSÁK CS. 2006; RÉDEI M. 2009). By the beginning of the 21st century, the promotion and support of the international presence of higher education became more important in the countries' higher education policy (QUIANG, Z. 2003). One of the most obvious elements of the process is the appearance of international students and the increase in their number in Hungarian higher education institutions as well. Hungarian universities compete for newcomer students not only at the national but also at international level.
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II. Objectives and questions

The aim of the doctoral dissertation is twofold. On the one hand, to impoundments the catchment area of Szeged's secondary schools and the University of Szeged within and beyond the national border. On the other hand, the importance of institutional, social and economic factors that determine students' choice of school. In my dissertation I paid special attention to examine factors, which determining the study purposes migration of students from Vojvodina to Hungary.

In my dissertation, I looked for answers to four main questions. The fourth main question can be divided up further sub-questions.

1. What is the extent of the catchment area within and beyond the national border in the case of the secondary schools of Szeged?
2. What is the extent of the catchment area within and beyond the national border in the case of the the University of Szeged?
3. What is the extent of the international catchment area in the case of the the University of Szeged?
4. What factors influenced students when chose a school?
   o What factors that influenced the secondary school students of Szeged when choosing secondary school?
   o What are the factors that affect the cross-border recourse to education, emphasis on the participation of Hungarian students from Vojvodina in Hungarian secondary and higher education?
   o How Vojvodinian Hungarian intellectuals (2-2 school principals and university lecturers) think about the impact of Hungary's educational attractiveness?
   o What factors influenced the choice of international students to study in Hungary and at the University of Szeged?

The importance of the empirical examination of the dissertation, that no comprehensive educational catchment area research has been carried out yet, which, in addition limitation of the catchment area by mathematical-statistical methods, also examined the factors that students take into account when choosing a secondary school and a higher education institution.

III. Applied research methods

To establish the theoretical background of the dissertation, I reviewed and processed the relevant Hungarian and foreign literature. I used both quantitative and qualitative research methods to answer the questions about the empirical research.

The necessary data for the impoundment of the catchment areas were provided by secondary schools of Szeged and Education Directorate of the University of Szeged. To reveal the school choice motivations, I made questionnaire surveys among examined target groups, which I completed with structured interviews.

In the course of questionnaire research among secondary school students of Szeged, I selected 23 institutions out of 30 secondary education institutions, of which I conducted research in 17 schools between October 2018 and May 2019. During this time, a questionnaire was administered to 1066 students in first and graduate classes. I conducted research primarily

among all first and graduate classes, where at least one student studied from Vojvodina. Based on the data of the Educational Authority, in the examined academic year (2018/2019), the respondents (N = 1066) covered 7,3% of all secondary school students of Szeged. In addition to the 23 institutions, four other secondary schools got into the basic population, however, due to their special character, I did not conduct a questionnaire survey, only a database containing the residences of the students was requested from the directors.

In the case of the University of Szeged, in the examination of the motivations of foreign students I separated the Hungarian students from Vojvodina and other international students. Between April 2017 and March 2018 I conducted a questionnaire and interview research among Hungarian students from Vojvodina studying at the University of Szeged. I personally filled out the questionnaire with 204 Vojvodinian students. At the time of the examination, 1056 university students were a place of residence of Serbia, of which reported almost 20% of my sampling. My method based on multistage sampling and snowball sampling (Babbie, E. 2001). On the one hand, the questionnaire was conducted at the Márton Áron College in Szeged, which provides as a dormitory for Hungarian students across the border. On the other hand, I asked the Hungarian students from Vojvodina to suggest new people belonging to the target group. in addition to the questionnaire, I also conducted structured interviews with 14 students in order to get to know the opinions and experiences related to the topic.

Between February and May 2019, I participated in part-time training at the University of Novi Sad by Campus Mundi scholarship. During this time, I conducted questionnaire research in 11 secondary schools in Vojvodina. Participating schools were selected using multistage sampling (Babbie, E. 2001). The aim of the questionnaire research was to reveal the intention to pursue higher education among Hungarian high school students in Vojvodina and to examine students' preferencies about institution for higher education and the reasons that influenced their choice. A questionnaire was administered to 442 high school graduates who were learning in Hungarian. According to the data of the Hungarian National Council, the total number of graduating high school students studying in Hungarian in Vojvodina was 1093 in the examined academic year (2018/2019). In my questionnaire research, I asked 40% of the target group. In addition to the questionnaire research, I conducted a structured interview with 4 people. Two of the interviewees were school directors at two secondary schools in Vojvodina and two were lecturers at the University of Novi Sad. In the interviews, the questions focused on the Hungarian-Serbian cross-border study migration and its future consequences.

In September and October 2020, I conducted online questionnaire survey among international students studying at the University of Szeged. The current epidemiological situation did not allow of the personal questionnaire. Therefore, I sent my questionnaire to the target group in two ways: on the one hand through the administrators of the Facebook groups of international students (ISUS - International Student Union of Szeged and ESN Szeged 2020/21-Erasmus, Stipendium Hungaricum, other scholarships). On the other hand, through the university's central e-mail addresses with the help of the university's doctoral administrator and the co-ordinators of the international trainings of the faculties. 181 international students filled out the online questionnaire. According to the data provided by the Education Directorate of the University of Szeged, 2533 international students attended university in the autumn semester of the 2020/2021 academic year, of which reported 7,1% of my sampling. In connection with the international students, I also conducted two structured interviews: with an employee of the Directorate for International and Public Relations of the University of Szeged and another with the representative of the Foreign Students' Secretariat of the Faculty of Medicine.

With the exception of Hungarian graduate high school students from Vojvodina studying in Serbia, I made principal component analysis and then cluster analysis by SPSS, in order to determine motivational clusters. Members of the given cluster can be characterized by which factors and what extent they influenced the choice of school.

IV. Summary of results

In my dissertation, I looked for answers to four main questions and four sub-questions.

1. Based on the data provided by secondary schools of Szeged (students' place of residence), we can conclude that their attractive effect extends most strongly to the settlements of Csongrád-Csanád county (Figure 1). In the academic year of 2018/2019, 89,9% of the students came from the county. The attractive effect is the strongest on the surrounding settlements, from which Szeged can be reached in 20-30 minutes (e.g. Algyő, Hódmezővárhely, Sándorfalva). Despite the fact that there are secondary schools in Makó, Hódmezővásárhely, Ásotthalom and Mórahalom, large number of students still arrive at one of the a secondary school of Szeged. Moving towards the northern part of the county, the attractive effect is getting smaller, but Csongrád and Szentes exceed from this area. There are famous secondary schools in these two settlements, however a significant number of students come to Szeged from there. Regarding the neighboring counties, the

attractive effect on Bács-Kiskun and Békés counties can be mentioned, within that Kecskemét, Kiskunmajsa, Csólyospálos and Orosháza send a significant number of students (32-46 people). As regard transborder catchment areas, it spreads mainly along the Serbian border areas. The majority of students come from the northern part of Vojvodina, which coincides with the location of the Hungarian-inhabited areas. The largest sending settlements: Szabadka, Zenta, Magyarkanizsa and Ada.
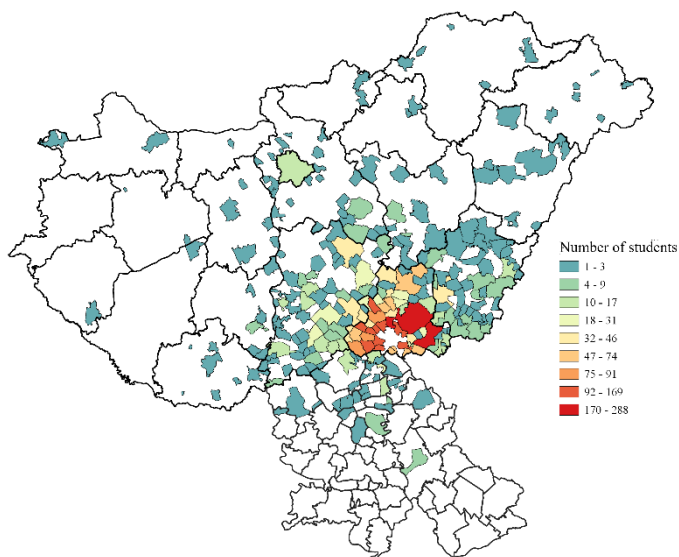

Figure 1. Catchment area of secondary schools of Szeged in the 2018/2019. academic year
Source: own construction based on the data provided by the secondary schools of Szeged

2. The attractive effect of the University of Szeged crosses the regional (NUTS2) level compared to the catchment area of secondary schools (Figure 2). Data for the last 10 years period show that 56,6% of the settlements of Southern Great Plain region can be classified as as highly attracted. In terms of the attractive effect on the neighboring countries, similar to high school, mainly an extensive catchment area can be observed in the northern settlements of Vojvodina. The largest sending settlements of Serbia are the same as those mentioned in the catchment area of high school.

Compared to secondary schools, University of Szeged attracts more Hungarian students from Vojvodina from more settlements of Vojvodina.
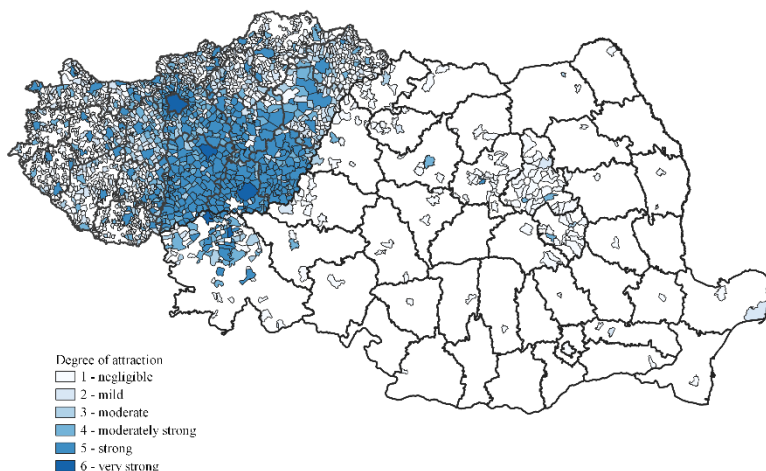

Figure 2. Catchment area of the University of Szeged based on the average number of students of the sending settlements
Source: own construction based on the data of the Education Directorate of the University of Szeged

3. In terms of total number of international students in the 2018/2019 academic year, the catchment area of the University of Szeged extended to 108 countries (Figure 3). Most of the sending countries are Asian (eg, Iran, South-Korea, Israel). Among the European countries, the most important partner countries are Germany, Spain, United Kingdom and Italy. The majority of international students arriving at the University of Szeged enroll in English or German fee-paying trainings at the Faculty of Medicine. Moreover, a large number of foreign students are under different scholarship programs. In the last decade, number and proportion of internatonal students coming to Hungary as part of scholarship programs has been increasing. Among the scholarship programs, Stipendium Hungaricum scholarship, established in 2013 by the Hungarian government, can be mentioned. Since its inception, the number of Stipendium Hungaricum students at Hungarian universities has increased to nearly tenfold. The number of Stipendium Hungaricum students arriving at the University of Szeged is constantly increasing. In fact, their number has quadrupled in the first half of the 2019/2020 academic year compared with the autumn semester of the

2015/2016 academic year. In the 2019/2020 academic year, Stipendium Hungaricum students composed 14% of all foreign students studying at the University of Szeged. My interviewee from the Directorate for International Affairs and Public Relations of University of Szeged said that as a result of COVID-19, the number of international students paying tuition fees has stagnated, despite the fact that their number has increased over the years. Number of Stipendium Hungaricum students has increased slightly, while the number of ERASMUS students has reduced to half in the current academic year.
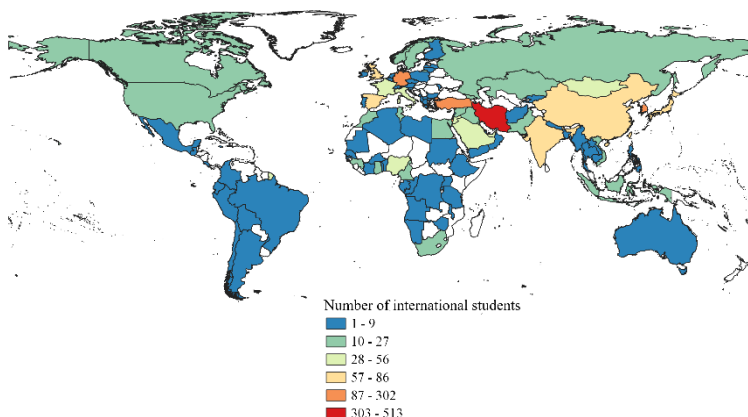

Figure 3. Number of international students at the University of Szeged in the 2018/2019 academic year according to sending country
Source: Education Directorate of the University of Szeged

4. Examination of motivations of school choice were explored according to the examined target groups. I examined the school choice among four target groups: high school students from Szeged; Hungarian high school graduates from Vojvodina who studying in Serbia; Vojvodinian Hungarian students from the University of Szeged and also international students from the University of Szeged.

4.1 Among the secondary school students of Szeged, the analysis resulted 6 clusters, then further grouping the "Average cluster" created 4 more sub-clusters. Majority of the six clusters were shaped by the geographical proximity in relation to travel time and travel cost, the previous primary school studies in Szeged, the origin of Szeged, as well as the previous knowledge of Szeged and the attractive existence of the city. These factors

were also took part in the formation of several clusters with different weights. Through the further clustering of the "Average cluster", four "subclusters" were created. Most of them were formed by the previous primary school studies in Szeged, origin of Szeged, reputation of the chosen high school, results of the students, available scholarships and the possibility of housing in dormitory.

4.2 To the question of what are the factors that affect the cross-border recourse to education, emphasis on the participation of Hungarian students from Vojvodina in Hungarian higher education, from the analysis of the six motivational clusters, it can be concluded that according to the respondents and interviewees, one of the most important factors / arguments for studying in Hungary is future career plans. While in Serbia the quality of education is inadequate, career opportunities are scarce and Serbian degrees are less competitive, in Hungary these factors are more favorable according to the respondents. Another important factor is the geographical proximity, the short travel time between the permanent address and the university, which provides an opportunity for more frequent home visits. The third important factor is the language, which also appeared as an independent cluster, namely the importance of learning in Hungarian and the lack of an adequate level of knowledge of the Serbian language. A push factor for the Hungarian students from Vojvodina coming to the University of Szeged is that it is not really possible to study in Hungarian in Serbia. Further factors influencing the decision: suggestion of the family and friends, the training chosen by the individual is not available in Serbia, the reputation of the University of Szeged and available scholarships, as well as the attractive, livable environment of Szeged. Based on answers of students from Vojvodina attending to secondary schools in Szeged, they chose Hungarian education, because most of them have rather poor Serbian language skills, they can study in Hungarian, and Hungary offers more favorable employment opportunities than Serbia.

4.3 As the reason of the migration from Vojvodina to Hungary for study purposes, my interviewees mentioned similar factors as could also be deduced from the results of the questionnaire research. The most important reason is the language barrier, which is related to the limited training supply of Hungarian-language higher education in Vojvodina. Another reason is the attractive existence of an EU diploma, which opens up opportunities for better employment in the EU labor market. In addition, the existing social capital (e.g. friends, relatives also study in Hungary), parental pressure and the economic and political situation in Serbia are also decisive factors in the decision. Three of interviewees expect negative consequences as a result of this large-scale study migration, because if the trend continues at this rate, the

proportion of the Hungarian minority in Vojvodina will continue to decline and the situation of Hungarian education in Vojvodina will deteriorate. One of the university lecturer believed that if a Hungarian university in Vojvodina had been established in the last decade, it might have moderated the process. In the opinion of the other university lecturer, the process is irreversible and its impact is already being felt due to the lack of middle-aged Hungarian intellectuals in Vojvodina, who left Serbia in the 1990s. All my interviewees mentioned those measures, with which the Hungarian National Council in Serbia tend to encourage further education in the homeland, but in the long run, the fate of the Hungarian minority in Vojvodina highly depends on the economic, social and political situation of the region and throughout Serbia.

4.4 According to the results of the questionnaire, international students chose Hungray, because they are attracted by the reputation of hungarian universities and their prominent position in university rankings, the high quality of teaching and because of the EU-accepted degree. In addition, lower cost of living, security, and existing social capital also played an important role in the decision. In the case of foreign students, I also determined motivational groups with cluster analysis. Factors, that most often create the 6 clusters, also appeared in the reasons for the decision in favour of Hungary: reputation of the University of Szeged and the high quality of education are attractive to foreign students. Another important aspect is the attractive existence of Szeged and the lower cost of living.

The results of my empirical research confirm several theories and models described in the theoretical part of the dissertation. Factors causing the study migration of Vojvodinian Hungarian students can be fitted into RAVENSTEIN, E. G. (1885) 'push-pull model'. What is a disadvantage in Serbia, in Hungary is the attractive factor for those coming from Serbia (e.g. lack of Serbian language skills - opportunity to study in Hungarian). The factors determining the university choice of international students studying at the University of Szeged confirm the factors of the theoretical model of CUBILLO ET AL. (2006), which outlines students' decision-making about study abroad. As KING, R. - FINDLAY, A. (2012) formulated as one of the theoretical frameworks of student migration, desire to get to know other cultures and new places was also decisive in the decision mostly in the case of international students studying at the University of Szeged.

V. Utilization of the results

Results of the dissertation can be used in several ways.

- The results of the dissertation can be useful from the point of view of the scientific sphere, because it determines the educational catchment area of Szeged not only with the help of the available statistical data, but also put emphasizes on the exploration of the factors determining the catchment area by questionnaire research.
- Results of the research can also be useful for local decision makers, because it is also important for secondary and higher education institutions, ever for governmental administration to be aware of the factors that determine the individual decisions of applicants to institutions, all of which determine the formation of the catchment area. This knowledge can contribute to policy decisions and to the marketing activities of institutions, too.
- In my dissertation I paid special attention to the exploration of the reasons of the migration from Vojvodina to Hungary for study purposes. The revealed reasons may contribute to the identification of the developmental directions of the Hungarian teaching arrangement in Vojvodina.

VI. Further possible directions of research

- Examination of the educational catchment area of Szeged could be extended to the primary schools of Szeged.
- The catchment area could also be examined for a period of time. It would be possible to compare the changes in the number of students, as well as the regions and settlements of the country affected by the changes.
- In the case of Vojvodinaian Hungarian students studying in Hungary, questionnaire research could be extended among Vojvodinian Hungarian students studying at other Hungarian universities to examine whether there is a difference between the motivations od school choosing.
- The examination of school choice could also be fulfill among all students of the University of Szeged.
- Another research direction could be to examine how COVID-19 affected school choice, especially in the case of Hungarian students of Vojvodina.

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