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THE POTENTIAL OF KNOWLEDGE TRANSFER FROM UNIVERSITIES TO THE TOURISM INDUSTRY IN POLAND: ASSESSMENT ON THE BASIS OF RESEARCH PROJECTS FINANCED BY THE NATIONAL SCIENCE CENTRE¹

Abstract: Knowledge transfer from universities to the socio-economic environment is becoming increasingly important. This challenge also applies to researchers in the field of tourism. The article examines the potential of knowledge transfer, understood as a university's ability to engage in cooperation with external stakeholders. The aim of this work is to identify this potential on the basis of the number and subjects of research projects qualified for funding by the National Science Center in Poland. According to this study, the number of research grants dedicated to tourism is insufficient. Taking into account the projects, an assessment of knowledge transfer potential is favourable due to the broad scope and relevance of the research.

Keywords: university, knowledge transfer potential, university-industry collaboration, tourism industry.

1. INTRODUCTION

Researchers' involvement in knowledge transfer is a challenge facing the next generation of universities. This is due to the fact that cooperation between universities and enterprises is considered one of the most important factors affecting the economic development of regions and countries (RAJALO & VADI 2017).

Academic strength is one of the conditions for entrepreneurial engagement in relations with external stakeholders, e.g. companies, local government, (ZUCKER, DARBY & ARMSTRONG 1998) and this strength depends on resources of knowledge. Knowledge can be treated as a strategic asset both for enterprises and other external stakeholders of a university due to the fact that academic knowledge is valuable, rare and difficult to imitate or substitute.

Academic strength is the basic component of knowledge-transfer potential, understood as a set of prerequisites that must be met to pass on this knowledge. The potential of knowledge transfer covers those features of the researchers and institutions (universities) which support involvement in relations with external stakeholders.

The aim of the article is to identify a researchers' potential for knowledge transfer in tourism. It focuses on the individual aspect of this potential, and uses one of several possible measures. This was assessed by

'academic strength' understood as the ability to obtain research grants. Previous research indicates the existence of a relationship between commitment in theoretical research and involvement in knowledge transfer to industry (MUSCIO & NARDONE 2012). The first part of the article is a review of the literature on university to industry knowledge transfer. This is followed by discussion of the notion of 'academic strength' and methods of measuring it. The second part is an attempt to assess the potential of knowledge transfer on the basis of research projects that qualified for funding by the National Science Center (NSC), i.e. the main institution that finances research in Poland. In this part, an analysis of tourism projects funded by the NSC is carried out. In the last part conclusions and recommendations for further research are presented.

2. THE POTENTIAL OF KNOWLEDGE TRANSFER FROM UNIVERSITY TO INDUSTRY: RESEARCH REVIEW

Establishing cooperation between universities and enterprises requires meeting certain conditions both by the sender and the recipient of information and

knowledge. The academic potential of knowledge transfer concerns those characteristics of a university and its researchers that have an impact on it. Recognition of these features leads to identification of so-called entrepreneurial universities and entrepreneurial researchers i.e. universities and researchers for whom the commercialization of research is as important as other types of academic activity.

Previous research aimed at identifying characteristics that affect knowledge-transfer involvement both at university level as well as that of individual researchers. Studies were dedicated to the role of the size of universities and faculties (SCHARTINGER, SCHIBANY & GASSLER 2001, MAIETTA 2015) and the availability of knowledge-transfer offices (ARVANITIS, KUBLI & WOERTER 2008, MUSCIO & NARDONE 2012). P. D'ESTE & P. PATEL (2007) believe that individual characteristics are more important for predicting knowledge transfer to industry than those of a university or faculty. Research on individual characteristics inferring knowledge transfer included the experience and position of a researcher (D'ESTE & PATEL 2007); the age of the researcher (BOARDMAN & PONOMARIOV 2009); gender (MAIETTA 2015); previous experience in cooperation (ARVANITIS, KUBLI & WOERTER 2008). However, there is still no unambiguous answer to the question of what institutional and individual factors determine a researcher's involvement in the knowledge transfer.

'Academic strength' is one of the basic features that has an impact on the potential of knowledge transfer. The issue of strength in cooperative relations between institutions was analysed in the tourism industry by G. MARZANO & N. SCOTT (2009), H. SAITO & L. RUHANEN (2017), mainly in the context of destination management. Strength is understood as the ability to impose one's will on other stakeholders (REED 1997). In cooperative relations between universities and the tourism industry, strength should be understood as the ability to attract partners for cooperation. It is the result of access to material resources (e.g. financial resources or access to infrastructure); structural resources such as position inside the organization; as well as individual resources such as charisma, experience or knowledge (MARZANO & SCOTT 2009). As pointed out by H. SAITO & L. RUHANEN (2017), universities are characterised by knowledge-based strength, and enterprises are equipped with so-called 'induced strength' based on the availability of financial resources. Higher education institutions therefore have greater bargaining power in their relations with enterprises when they have more academic strength. This should be understood as the ability to create knowledge, which due to its original and innovative character, can be attractive (valuable) for institutions cooperating with universities.

Research on the importance of academic strength concerns both the individual (D'ESTE & PATEL 2007) and institutional levels (MUSCIO & NARDONE 2012). As recognized in those studies, there is a connection between the research activity of a university and industry involvement. According to E. MANSFIELD (1995), the higher the quality of research, the more intensive transfer of knowledge is in practice. In other analyses it was found that there is a positive relationship between the quality of research conducted at a university and the probability of establishing relationships with business (MANSFIELD & LEE 1996, MUSCIO & NARDONE 2012). The amount of funds obtained from public sources may also be treated as a measure of faculty or university strength. P. D'ESTE & P. PATEL (2007) showed that the higher the level of funds acquired for research at the faculty level, the greater the individual engagement of researchers in interaction with industry. A. MUSCIO & G. NARDONE (2012) found that there is a significant and positive relationship between public funds obtained for academic research and funds obtained from the commercial activity of a university.

The individual achievements of a researcher can influence individual knowledge-transfer potential. In other words, the highest qualified researchers are also the most involved in cooperation with practitioners (PERKMANN *et al.* 2013). Moreover, academic achievements have an impact on the area (territorial scope), within which researchers and enterprises cooperate. P. D'ESTE & S. IAMMARINO (2010), examining university faculties, showed that the higher the quality of research, the greater the opportunity to recruit distant partners for cooperation. On the one hand, this relationship stems from the fact that companies seeking university partners are looking for original and new solutions that are the result of serious research. On the other hand, researchers who are able to offer unique knowledge through their research are also more likely to be involved in knowledge transfer. Referring to the resource-based theory, it should be pointed out that academic knowledge may have the characteristics of strategic resources from the perspective of the enterprise, i.e. be valuable, rare and difficult to imitate or substitute.

Measures of academic achievements include the quantity and quality of publications, and the ability to obtain research grants. R. BEKKERS & I.M. FREITAS (2008) found that an increase in the number of publications, has a positive impact on cooperation with external stakeholders. This factor is relatively more important for theoretical research and less important (or meaningless) for applied research. P. D'ESTE & P. PATEL (2007) indicate that success in obtaining funds for research may increase the attractiveness of

the researcher in the eyes of business. On the other hand, researchers who obtain funding for theoretical research projects may be less interested in additional work for business. The research shows that the ability to raise funds for theoretical research does not have a statistically significant effect on cooperation (D'ESTE & PATEL 2007).

3. ASSESSMENT OF THE POTENTIAL OF KNOWLEDGE TRANSFER ON THE BASIS OF RESEARCH GRANTS QUALIFIED FOR FUNDING BY THE NSC IN POLAND

As indicated in the previous section, the number of grants obtained by researchers may be treated as one of the measures of academic strength. The study was conducted in July 2018 and, as a project database, an internet search engine run by the NSC was used. It contains information on projects financed by the NSC from 2001 to 2018 (the database does not include those qualified for funding but a contract had yet to be signed). Information on the projects include such details as the date of starting and duration, the value of funding, the number of contractors, as well as a list of publications that appeared as a result of the research. Projects can be sorted on the basis of different criteria such as city, province, project manager, gender, academic title/degree, the project manager's national origin, project ID, type of competition, group of disciplines, panel, granted amount of funding, and keywords.

For the purpose of this study, a keyword search was implemented. Search was based on following phrases: tourism, tourism geography, tourism economics, tourism management, tourism market, hotel industry, travel agencies, hotel companies, tourism, and leisure time.

As a result, information on 28 academic projects on tourism financed by the NSC was obtained². All projects were implemented within the HS section, i.e. Arts, Humanities and Social Sciences. Most projects (19) qualified for funding under the HS4 panel, i.e. "Individuals, institutions, markets", covering the following disciplines: economics, finance, management, demography, social and economic geography, urban studies. Seven projects were assigned to the HS3 panel i.e. "The study of the human past" (history, archaeology, ethnology, cultural anthropology). One project was financed under the HS5 panel ("Norms and governance") and HS2 ("Culture and cultural production").

The total value of tourism research projects amounted to PLN 4 402 306, which was 0.47% of the total funding for all research projects within the HS section in 2011-2017. The research projects from the HS4 panel obtained funding of PLN 2 988 864 (1.51% of the total HS4 panel funding). The smallest received financing at a level of 39 371 PLN, and the most, 465 185 PLN, with an average of 157 225 PLN. Due to the large potential for knowledge transfer, the titles of grants funded under the HS4 panel will be analyzed in the next part of the article.

The main areas that have been the subject of research can be identified on the basis of the so-called descriptors, i.e. ancillary terms indicating the fields of research covered by a specific project. The most frequent descriptor was HS4_5: "Population, economy, socio-economic development, sustainable development"³, found in half of HS4 panel projects. Slightly fewer (seven) were assigned to the HS4_13 descriptor: "Socio-economic geography"; and six to the HS4_2 descriptor: "Microeconomics and institutional economics".

The analysis of grant titles and keywords enables a more detailed identification of issues undertaken by researchers in the field of tourism. The first set of problems analyzed are the determinants of competitive advantages in the meso- (industrial and regional) and microeconomic systems. The authors examine sources of competitive advantage that may contribute to the success of tourism enterprises. Other research includes the role of the quality of work as a competitive potential of companies, and determinants of loyalty in the tour operator's market. The impact of regulation on the marketing orientation of tour operators and the role of the 'convention bureau' in shaping a city's competitiveness are also analyzed. The second set concerned the determinants of innovation, whose purpose was to develop the concept of a health tourism innovation system. In another, the authors try to identify the importance of knowledge transfer from universities to tourism enterprises on innovativeness. Subsequent projects examine the determinants of the ability to absorb innovations in the tourism industry in the field of renewable energy sources, or the impact of innovation on the value of hotel enterprises. The third area covers issues related to conditions of cooperation and network connections between institutions in a tourism region. Research here concerns the antecedents of networks in tourism as well as the possibility of using social networks to study the factors affecting cooperation in the tourist region. The issues of cooperation between companies with suppliers in business tourism as well as inter-regional agglomeration effects on tourism (in Poland) have also been undertaken. The fourth set covers issues devoted to

Table 1. Projects qualifying for funding according to faculty

Unit (HS)	Amount (PLN)	Number of projects
University of Warsaw; Faculty of History	913,447	4
Poznań University of Economics and Business; Faculty of International Business and Economics	676,888	6
University of Warsaw; Faculty of Geography and Regional Studies	531,831	2
University of Economics in Katowice; Faculty of Management	473,177	2
Krakow University of Economics; Faculty of Management	292,230	2
Bialystok University of Technology; Faculty of Management	266,370	2
Stanisław Leszczycki Institute of Geography and Spatial Organization, Polish Academy of Sciences (IGSO PAS)	197,950	1
University of Szczecin; Faculty of Management and Economics of Services	188,000	1
Krakow University of Economics; Faculty of Finance	178,000	1
Jagiellonian University, Krakow; Faculty of International and Political Studies	140,348	1
Silesian University of Technology, Faculty of Organization and Management	129,800	1
Adam Mickiewicz University; Faculty of Historical Studies	108,597	1
University School of Physical Education in Wrocław	99,274	1
Wrocław University of Economics; Faculty of Economics, Management and Tourism	97,900	1
Nicolaus Copernicus University; Faculty of Earth Sciences	69,123	1
Andrzej Frycz Modrzewski Krakow University; Faculty of Humanities	39,371	1

Source: author based on NSC 2018 data.

sustainable development in tourism and its management spatially. One of the projects addresses the issue of using the concept of 'ecosystem services' for the purposes of managing sustainable tourism development using the example of lake districts. In others, a relationship between second homes and the sustainable development of tourism in a peripheral tourist region is analyzed, as well as the possibility of using *Foresight* as a tool for improving tourism management in the region.

The projects qualifying for funding were proposed by researchers from nine cities and 16 different academic faculties. The one that obtained the most grants in terms of value is the Faculty of History of the University of Warsaw (PLN 913 547) for four projects within the HS3 panel (Table 1).

Taking into account the number of projects financed, the highest number of grants (21% of the total) were obtained by the Faculty of International Business and Economics at Poznań University of Economics and Business. This unit is also the leader in terms of the value of grants acquired from the HS4 panel. Research grants are mainly used by researchers in the early stages of an academic career. As presented in the Table 2, the principal investigators of projects that qualified for funding by the NSC are mostly researchers with PhDs (61%), while the second group consists of those with a Master's Degree.

Table 2. Projects by the degree or title of the researcher

Degree and title of the principal researcher	
Ph.D.	17
Master	6
'Habilitation'	3
Professor	2

Source: author based on NSC 2018 data.

The tourism projects qualified for funding most often were submitted for OPUS (46%), Sonata (28%), Preludium (21%) and Fuga (4%) schemes. Projects were carried out by teams of between one and 30 people. The most common was three, but the average was five. The shortest project lasted 17 months with the longest lasting 48 months and the average was 33.5 months.

4. DISCUSSION AND CONCLUSIONS

The existence of potential knowledge that can be considered as worth transferring is a prerequisite for a researcher's engagement in relationships with external stakeholders. The source of such valuable knowledge includes research grants financed by national and international agencies.

The assessment of academic strength of tourism researchers carried out in this article is ambiguous. On the one hand, issues undertaken in tourism research have significant potential for commercial use. Projects qualified for funding concern various current issues and can be assumed as in line with the information needs of enterprises. Although NSC funding schemes are dedicated to theoretical research, there is a high probability of a future application of results. This requires appropriate 'translation' of the results obtained into language understood by representatives of the tourism industry (popular academic language), as well as the continuation of applied research, based on results of theoretical research. Many of the studies presented here are currently in progress and the application's potential will be revealed in the years following.

On the other hand, a quantitative assessment of tourism projects must be negative. The number of projects qualified for funding seems small. The analyzed period covers 16 years, which means that on average 1.75 projects received funding per year. From 2001 to 2017, 4073 grants qualified for funding within the HS group, (NSC 2018), which means that grants related directly to tourism accounted for only 0.69% of all projects.

It should be remembered, however, that this is not the only source of obtaining funds for academic research in the field of tourism. A grant funded by NSC should not be treated as an absolute determinant of the level of research in tourism. Further research should take into account other measures that make up the potential for knowledge transfer to the tourism industry, e.g. grants financed from other sources (National Center for Research and Development, European grants, government research), as well as the number and quality of academic publications.

The presented results do not take into account the actual involvement of researchers in knowledge transfer. Research undertaken so far shows that academic activity and involvement in relations with external stakeholders are complementary to each other (Perkmann *et al.* 2013), and success in research activity leads to commercial success. Research conducted in Egypt indicates that a low level of academic research is one of the most important barriers to knowledge transfer from universities to tourist companies (SOBAIH & JONES 2015).

Further research would therefore verify a hypothesis indicating that academic strength, understood as the ability to obtain research grants, is a predictor of academic engagement in knowledge transfer. This is an important topic and has not yet been undertaken in relation to the tourism industry in Poland.

ENDNOTES

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² From the original search results (30), two projects did not meet the criterion of connection with tourism and were excluded.

³ In 2014, NSC Council changed the name of the HS4_5 descriptor to Resources and Sustainable Development.

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