Article

Networks, Innovation and Knowledge Transfer in Tourism Industry: An Empirical Study of SMEs in Portugal

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Abstract: The present study aims to investigate how commercialisation and knowledge transfer between the SMEs of the tourism sector and the higher education institutions (HEIs) are made, as well as to find out whether the SMEs of the tourism sector are part of tourism networks, and what their motivations are. We used a qualitative methodology, applying the triangulation method to eight SMEs and one HEI. The results indicate that the commercialisation and knowledge transfer between the SMEs and the HEIs are not effective. SMEs are part of regional networks of business innovation; however, they do not participate in R&D activities with HEIs. Some suggestions were made to SMEs, HEIs, and regional governments to speed up commercialisation and knowledge transfer in the tourism sector. We adapted the Triple Helix Model to the tourism sector, thus creating the "Triple Helix in the Tourism Context". Only a few studies have researched knowledge commercialisation in the tourism sector, a gap that this article aims to compensate.

Keywords: tourism; commercialisation and knowledge transfer; Triple Helix; tourism SMEs; regional development networks

1. Introduction

In today's competitive world, which is rapidly and profoundly changing, and where innovation and creativity are crucial matters, organisations are becoming increasingly aware that their physical and financial assets are not capable of generating competitive advantage in time, thus understanding that only their intangible assets can provide value to their products and services (Lopes-Costa and Munoz-Canavate 2015; Trimarjoko et al. 2021). Consequently, the knowledge basis of any organisation becomes an asset of rising importance, although their leaders still have to face the difficulties related to its acknowledgement (Cooper 2006). This innovation can be understood as the process that includes the conception, development, or management of activities and that results in the commercialisation of new (or improved) products or in the first use of new (or improved) processes (Matsuo 2006).

Nowadays, universities play an increasingly important role in the economy of knowledge in production and knowledge disclosure. Despite being aware of their role in terms of knowledge, there is the general perception that universities are self-centred and are not related to practical daily realities and business practices (Hawkins 2006). Consequently, the academic knowledge transfer to the industry should be an emergent concern to both academics and professionals (Cooper 2006; Walters et al. 2015).

The need for scientific knowledge within the scope of the innovation process regarding small and medium companies is increasingly reshaping the role of universities, turning

them into teaching, research, and knowledge commercialisation drives (Biranvand 2020; Khan 2017; Wang et al. 2021).

Tourism is a globally important sector where competitiveness is present and to which a high level of knowledge transfer is associated (Tučková et al. 2017). All over the world, tourism has been one of the sectors that have significantly grown in the last few decades. In Portugal, in particular, it is one of the country's main economic activities and a strategic area for the competitiveness of the economy (Lopes-Costa and Munoz-Canavate 2015). As an industry in Portugal, tourism has yielded impressive growth in the last decades, and during the economic crisis, it became a milestone of economic development. According to Butcher and Sparks (2011); Liu (2018); Guo et al. (2017); Thomas (2012), knowledge transfer in the tourism sector from the point of view of small and medium-sized enterprises (SMEs) must be studied.

To promote this transfer of knowledge in the tourism sector from higher education institutions, it is necessary to establish partnerships with companies in this sector, considering that these educational institutions will allow a more efficient transfer of knowledge (Czernek 2017). From the perspective of regional governments, they must take advantage of the resources that their regions have. In Portugal, in general, all regions have business incubators; however, the specification of the business areas to which they are dedicated means that no type of company can develop inside an incubator close to them. Thus, regional governments should reshape the strategies of the existing incubators to accept companies in the RIS3 specialisation domains that were previously defined (Lopes et al. 2018c). For the same authors, while higher education institutions must offer better conditions to their researchers so that results can be transmitted on time, regional governments must reinforce incentives to R&D and transfer knowledge that benefits companies from the tourism sector. Therefore, the tourism sector is constantly changing. Higher education institutions must keep up with these constant changes, responding more quickly to SMEs' problems in the present tourism sector (Ritchie and Ritchie 2002).

In Portugal, tourism is currently one of the RIS3 (Research and Innovation Strategies for Smart Specialisation), which consists of a strategic approach to economic development through support focused on research and innovation (Lillebø et al. 2019). This concept is based on the principle that the concentration of knowledge resources and its connection to a limited number of prioritised economic activities will allow the countries and the regions to become competitive (and maintain this competitiveness) in the global economy (Lopes et al. 2019; Lopes et al. 2018c; Tiits et al. 2015).

Therefore, understanding how the organisations of this sector acquire, process, and commercialise knowledge is crucial for the development of effective knowledge transfer mechanisms.

For that purpose, we will use a qualitative methodology, analysing eight SMEs in Portugal, in the tourism sector. The aim is to understand how the knowledge commercialisation and transfer between the tourism sector SMEs and the higher education institutions (HEIs) are assured. We also want to confirm whether the tourism sector companies are part of tourism networks and to find out their motivations. To this end, we consider tourism networks as collaborative networks that deal with tourist agents and public entities and develop actions to structure products and services to promote tourism destinations.

The article is structured as follows: Section 2 presents the conceptual background before detailing our methodology in Section 3 and the empirical evidence in Section 4. Finally, Section 5 establishes the conclusions, limitations, and future research prospects.

2. Conceptual Background

The research on knowledge transfer has been less enhanced in tourism than in other sectors of the economy (Xiao and Smith 2007). Knowledge transfer can be defined as the act of transferring knowledge from one entity to another. Thus, knowledge transfer can be carried out between companies, between society and organisations, between private and public organisations, and between producers and customers. According to Szulanski (2000),

knowledge sharing depends on the recipient's absorption capacity, which is related to his previous knowledge and skills and the motivation he has to seek to integrate this new knowledge. The lack of motivation in this regard may lead to procrastination, rejection, sabotage, passivity, or acceptance in the implementation and use of shared knowledge.

Knowledge transfer in the tourism sector concerns the transfer of knowledge between the various regional actors within the sector (Lopes and Farinha 2020; Raisi et al. 2020; Ruhanen et al. 2021).

In times of continuous technological, socio-economic, and regulatory development, academic and professional researchers in several sectors (IT, engineering, medicine, etc.) have adopted cooperation as a way of promoting the bidirectional sharing of knowledge (Brennenraedts et al. 2006; Cummings and Teng 2003). However, as stated by Czernek (2017); Walters et al. (2015); Scott and Ding (2008), the tourism and hotel-related industries are outdated in this area. The interactions between university, industry, and government (Triple Helix), which are based on innovation and entrepreneurship, are the keys to economic and social development based on knowledge. Going beyond the industry evolution through mutual interactions, this is about the transition of the main spheres from the double to the triple helix. This innovation regime assumes a proactive posture by placing knowledge into practice and by amplifying the inputs that will create academic knowledge (Etzkowitz et al. 2000; Etzkowitz 2003; Etzkowitz and Leydesdorff 2000).

The higher education institutions (HEIs) participate in the economic development of the regions where they are located (Soyer et al. 2020). This scenario has brought countless opportunities (for example, licensing, research contracts, consulting services, better mobility with the industry) for the academic institutions. Although HEIs have progressed as far as the development of internal processes is concerned, to support knowledge transfer and commercialisation, the main question is focused on the effectiveness of connecting corporate and academic knowledge systems (Hewitt-Dundas 2012; Lopes et al. 2018a; Santoro and Gopalakrishnan 2000).

However, research in tourism faces idiosyncratic obstacles regarding knowledge transfer, which can be attributed to the whims of the tourism industry. The tourism industry is spatially diffuse, highly fragmented in its property structure and product offering, seasonal, and characterised by a highly varying labour force and, even more importantly, it is a common belief that it has a low acceptance rate regarding research results (Czernek 2017; Hallin and Marnburg 2008; Hjalager 2002; Shaw and Williams 2009).

It is possible to identify two great challenges to communication in tourism research and the agents operating in the field. Firstly, it is postulated that a communication challenge is related to the nature of the research. Xiao and Smith (2007) state that multidisciplinary research in tourism can be a source of trouble. Therefore, while academics produce a significant amount of research in tourism, only a small subset may be relevant to the industry. A second communication challenge is related to language. Frequently, when the academy and the tourism industry try to communicate and collaborate, it seems they are speaking two different languages—an academic and a commercial one (Hardy and Eccleston 2018).

It is not easy to find examples of academic work that have influenced the management of commercial organisations in tourism (Ryan 2001). Ruhanen (2008) case study reveals a circle of professionals who are distant from the academics and the knowledge they build. Ritchie and Ritchie (2002) and Xiao and Smith (2010) also describe a sub-use of academic research by tourism professionals. The study of Frechtling (2016) is focused on the impact of tourism magazines on professionals and points in a similar direction.

Therefore, understanding how organisations acquire and process knowledge is fundamental for developing effective knowledge transfer mechanisms. Xiao and Smith (2007) provide a valuable starting point through the conceptualisation of the use of knowledge. They categorise how knowledge can be used and evaluate some of the influencing factors of knowledge in the decision-making process. They argue that the perceived effectiveness of knowledge is ultimately assessed by the extent of the user's expectancy levels.

3. Methodology

3.1. Data Collection

Recently, the interest in social sciences in qualitative research is growing steadily. Consequently, this research uses a qualitative methodology that will be able to develop, explain, and change concepts and ideas. The qualitative methodology has several advantages because it is possible to explore less known phenomena, providing a comprehensive vision of the phenomenon under study. It also allows the research to be carried out in the natural environment of the researched entities and enables propositional sampling and data inductive analysis. The purpose of the qualitative methodology is to deepen the understanding of the particular, to systematically describe or interpret matters or phenomena from the individual or the population's point of view, thus creating new concepts and theories (Mason et al. 2010; Mohajan 2018). The qualitative methodology is the most suitable for this research since the commercialisation and transfer of knowledge is a recent topic in the tourism sector. The application of this methodology will allow us to create new concepts and theories about the commercialisation and transfer of knowledge in the sector.

In this context, the present study aims to understand how commercialisation and transfer of knowledge takes place between small and medium-sized companies (SMEs) of the tourism sector and higher education institutions (HEIs). We also intend to confirm whether the tourism sector companies are part of the tourism networks, and find out their motivations in this context. To achieve the proposed objectives, we use the triangulation method to articulate several qualitative methods (Yin 2013). We carried out interviews and added the analysis of the documentation and the companies' records available online.

According to the study's goals, we adapted the questionnaire to be applied to SMEs from the studies of Lopes et al. (2018b) and Czernek (2017). The questionnaires were requested from the authors and received during December 2018. They were translated into the native language of the companies and HEIs and subsequently applied. The CEOs of the companies have been in the companies since their foundation, except for Company E, which took office in 2004. The questionnaire has questions about the commercialisation and transfer of knowledge, cooperation networks, collaboration in research and development (R&D) and R&D activities (see Appendix A).

This questionnaire contains mainly open questions to give the respondents greater freedom when answering the questions. The survey was applied in March 2019, and it depended on a previous validation before the subsequent email distribution. The questionnaire was validated using the Delphi method (Marques and de Freitas 2018), where five PhD researchers and professors in the subject under study were invited to analyse possible failures in the questionnaire. After two rounds, the five PhD researchers reached a consensus and validated the questionnaire. The Delphi method has been widely used to validate qualitative research about tourism, such as the study of Ocampo et al. (2018); Kardaras et al. (2013); Konu (2015).

The sampling of this study is for convenience (companies and HEI), as only companies that were registered in the tourism of Portugal (https://registos.turismodeportugal.pt/, accessed on 15 February 2019) and that had already started their business more than a year ago were contacted (Khazami et al. 2020). We sent the questionnaire to 40 companies that met these criteria. We received eight valid questionnaires, which were answered by the CEOs of the respective companies. We received a response on 18 March 2019 from company A; from companies B, C, and D on 13 March 2019; from company E on 29 June 2019; from company F on 5 July 2019; and from company G on 22 June and company H on 25 March 2021, after sending a reminder (23 March 2021) to companies that had not previously responded. Calls were also made via skype to deepen the responses received (Table 1).

Table 1. Skype calls.

Companies	Professional Category	Skype Call Date	Scheduled Time
Company A	CEO	22/03/2019	14:00 to 15:30
Company B	CEO	19/03/2019	16:15 to 17:20
Company C	CEO	21/03/2019	11:00 to 12:15
Company D	CEO	22/03/2019	15:45 to 17:00
Company E	CEO	04/07/2019	10:30 to 11:40
Company F	CEO	11/07/2019	14:00 to 15:15
Company G	CEO	25/07/2019	10:00 to 11:15
Company H	CEO	29/03/2021	10:30 to 11:55
HEI A	Scientific coordinator	19/04/2021	18:00 to 19:15

On 13 April 2021, we contacted six coordinators of six HEIs tourism courses by email. However, only one showed availability to participate in the study. The interview was conducted on 19 April 2021 (Table 1).

After the steps previously indicated, three steps followed: (1) the verification of data requirements; (2) data processing; (3) elaborate point 4 of the present study. In the verification stage, we evaluated the relevance and importance of the data collected, taking into account the study's objectives. At this stage, we compared the data collected with other external data such as company websites, social networks and documents available to the public. In the second step, the database was created in Microsoft Excel 2016 with all the questions and a transcript of the answers of the eight companies under study. Then, the encoding was done by subject in the same Microsoft Excel 2016 file to synthesise all the information. In the third stage, we elaborated the results section of the present study with the synthesised information.

The companies that participated in the study market the following services: tourist transportation, tourism souvenirs, tourism animation, and events, and travel planning. These companies are located in the regions where tourism is one of the intelligent specialisation domains selected in RIS3.

The HEI that participates in this study has a tourism course, is located in the North of Portugal and has around 1000 students (188 students are from the tourism course) enrolled in the academic year 2020/2021.

3.2. Tourism Industry and Companies

The SMEs in the tourism sector tend to show some limitations related to the knowledge and innovation absorption created in the HEIs. These limitations come essentially from the small size of tourism companies and the industry's fragmented nature (Carlisle et al. 2013; Pikkemaat 2008). However, there are cooperative structures considered appropriate to support innovation and, as a consequence, the knowledge transfer in the tourism SMEs, like, for example, the Triple Helix (Franchetti and Page 2017).

In this context, the knowledge transfer must be carried out successfully between the tourism SMEs and HEIs; otherwise, this new knowledge becomes useless (Barcelo-Valenzuela et al. 2016; Weidenfeld 2013).

The business fabric in Portugal is composed mainly of SMEs. The Decree-Law n° 372/2007, of 6 November, stipulates that the category of micro, small, and medium-sized enterprises (SMEs) is made up of companies that employ less than 250 people and whose annual turnover does not exceed 50 million euros or whose total annual balance sheet does not exceed 43 million euros. Within this classification, a small company is a company that employs less than 50 people and whose annual turnover or total annual balance sheet does not exceed 10 million euros.

According to data from PORDATA (https://www.pordata.pt, accessed on 15 February 2019) related to 2017, 99.9% of the total are SMEs. With these figures, it is easy to understand the importance of SMEs in the Portuguese economy. The tourism sector

in Portugal is the biggest exporting economic activity in the country, being responsible, in 2018, for 51.5% of the services' exports and 18.6% of the total exports' amount, and the tourism revenues have registered a contribution of 8.2% (https://www.ine.pt, accessed on 15 February 2019) in Portugal's gross domestic product. In this context, the present study includes the participation of eight tourism companies located in the Portuguese districts of Faro, Coimbra, Aveiro, and Leiria (Table 2).

Table 2. Tourism Companies.

Companies	District	Region RIS3	No. Of Employees Without Higher Education	No. of Employees with Higher Education	Foundation Year	Type of Company	Billing Volume for the Year 2018	Services
Company A	Faro	Algarve	105	15	2010	SME	1,600,000€	Tourists' Transportation
Company B	Leiria	Centro	0	1	2017	SME	45,000€	Tourism souvenirs
Company C	Aveiro	Centro	2	0	2017	SME	80,000€	Tourism animation and events
Company D	Leiria	Centro	2	2	2011	SME	130,000€	Travel planning
Company E	Castelo Branco	Centro	4	3	2002	SME	105,000€	Tourism animation and events
Company F	Coimbra	Centro	3	3	1998	SME	125,000€	Tourism animation and events
Company G	Guarda	Centro	2	7	2013	SME	280,000€	Tourism animation and events
Company H	Coimbra	Centro	3	5	2005	SME	175,000€	Tourism animation and events

Company A is located in the district of Faro, in Portugal, and is included in the RIS3 of Algarve. The company is almost exclusively dedicated to business tourists and travellers who fly to Algarve, providing private transfers with drivers in Algarve, Lisbon, Alentejo, and the south of Spain. Company A has 120 collaborators, 15 of which have higher education training.

The remaining companies are located on RIS3 in the Centro de Portugal region, distributed among the districts of Aveiro, Coimbra, Leiria, Guarda, and Castelo Branco. Their activities focus on tourist entertainment and the organisation of events, such as guided tours, nature tourism, and cultural tourism, including entertainment, gastronomy, hiking, walking, cycling, and mountain tours with vehicles all over the country terrain. These activities privilege contact with nature, historical and cultural heritage, and have as their target audience small groups of tourists, family members, or company employees. Company B is dedicated to selling souvenirs or small souvenirs, alluding to elements of local tourist interest. Company D is dedicated to the planning of tourist itineraries and small groups, offering guided tours.

Except for company B, all the others combine employees with and without higher education, present a sales volume and a global number of employees that positions them as small and medium-sized companies. Finally, only company F originated from the last century; all the others were created during the 21st century.

4. Results

The HEIs, as producers of knowledge, have adopted the third mission in the last few decades, aiming at the promotion of socio-economic development. The HEIs have also adopted a set of activities that give some relevance to the transfer of knowledge, such as the dissemination, sharing, exchange, and commercialisation processes (Lopes et al. 2018b).

In this context, HEIs need to maintain a good relationship with the business fabric in the regions where they are located.

Through the various questions asked to the managers of the eight tourism SMEs, we will try to understand the current state of knowledge transfer and commercialisation in the Portuguese tourism sector. We will also try to check new ways of improving the current situation. To assess what was previously mentioned, several themes were considered, such as the capital gains of the human resources trained in higher education institutions and their weaknesses; the creation of partnerships in the scope of Research and Development (R&D); the establishment of networks; the main difficulties found in the knowledge transfer in the sector; cooperation in R&D projects with higher education institutions; barriers found in university–industry cooperation; and how the results derived from R&D in tourism can be commercialised.

Considering that knowledge is one of the most precious assets to companies because they support added value and sustainable competitive advantages, their human resources are essential. The eight companies that have participated in this study have stated that they do not have training incentive policies. They prefer to hire collaborators with higher training qualifications; however, three companies have admitted that they had some difficulties in recruiting. Human resources with higher education training usually prefer to go to Lisbon, where companies can pay better salaries.

In Portugal, employability rates of the newly graduated in tourism are high (70%). However, employment is unstable or even seasonal, and the salaries at the beginning of the career are also low. Despite this, after three years of experience, they usually receive wages above the average. Consequently, the newly graduated who work in the tourism industry sense that their education is becoming increasingly important and relevant for them insofar they progress in their careers (Albu and Draghici 2016; Mckercher and Coghlan 1995; Zagonari 2009).

As far as internships are concerned, two tourism companies mentioned that they usually welcome interns from higher education institutions. The biggest gap they find in those interns is the low level of knowledge regarding digital marketing. They also refer that, sometimes, interns do not have a clear notion about the sector's reality in practical terms. Only one of the companies stated that newly graduated bring some new knowledge to the company.

Tourism SMEs that have participated in the present study also mentioned some difficulties they face in the knowledge transfer of the tourism sector between companies and HEIs. Companies A, G, and H indicated that HEIs don't show any interest in the transfer of knowledge, considering that this process takes a long time to be implemented. Companies B and E mentioned that the know-how taught at HEIs is not enough and that, sometimes, it is far away from the sector's reality. Company C stated that HEIs don't support the tourism sector companies and do not have the appropriate infrastructures to allow a natural and fluid knowledge transfer. Companies D and F consider that the HEIs do not explore and are not concerned with Portugal as a destination beyond leisure tourism.

The results suggest that HEIs should elaborate on an integrated strategy so that tourism education can influence the development of the regional tourism industry. Tourism education must be geared to the needs that the market has. The HEIs should transfer their knowledge to the region's companies through several agreements, such as knowledge transfer agreements with regional governments, or even the disclosure of consulting experiences that can be carried out by their students (Carlisle et al. 2013; Mayaka and Akama 2007; Tiffin and Kunc 2011). Companies are geared to become problem-solving organisations and not companies that know their main basis (Michael Hall 2011; Oxenswärdh and Persson-Fischier 2020). However, there are several initiatives that HEIs perceive as good practices that allow the sharing of knowledge, which is beneficial for these types of companies operating in the tourism area.

> *"There are several activities that take place that could be considered Knowledge sharing activities, such as seminars and classes with guests from the trade that master subjects*

> *that could not as easily be discussed in class without due support from someone working in the area. The board highly incentivises these activities. Aside from these activities, normally open to all the students from all courses, in normal conditions, field trips to companies, institutions and events are also incentivised but not formally and economically sponsored by the board.*" HEI A

The use of knowledge requires an understanding of the knowledge transfer process. There are two main barriers to knowledge transfer: access to knowledge and knowledge ambiguity. The inability or unwillingness to transfer knowledge is a factor that prevents knowledge flow and has been quoted as the main reason for failure regarding knowledge transfer. The ambiguity and complexity of knowledge play an inhibiting part in the knowledge transfer process (Gupta and Govindarajan 2000; Sheng et al. 2013; Simonin 1999; Szulanski et al. 2004).

There are several barriers facing knowledge transfer that explain why it is not being carried out effectively and efficiently, transversal to other sectors. Concerning academics, the greatest problem lies in the inadequacy of the business partners. Problems related to the interaction with companies, the high turnover of the staff, and the lack of continuity in the companies' research strategies, can interfere in the short term orientation of the sector's policy. The mutual lack of understanding about the working expectations and priorities is another barrier to consider (D'Este and Patel 2007; Muscio 2009; Wit-de Vries Esther et al. 2019).

There are still informal and cultural barriers, such as insufficient rewards for university researchers, different interpretations of the users, bureaucratic inflexibility, technology transfer offices (TTOs), lack of qualified and proper staff, absence of professional experience in the HEIs human resources, lack of support by stakeholders for research development, and also concerns regarding the possible interference with academic freedom caused by the user's cooperation interface (Bradley 2013; Muscio and Vallanti 2014).

Aiming at bringing closer the tourism companies and the knowledge transfer processes, we have asked the companies about the gaps of the sector, which they consider should be analysed by the R&D areas of the HEIs. The companies have pointed out that in tourism R&D activities, the HEIs should include the different applicabilities of artificial intelligence and Machine Learning to the tourism sector; study the negative and positive impacts of tourism in the regions, presenting solutions and recommendations for companies and regional governments; study the preferred destinations of young/academic tourism in the countries belonging to the Portuguese language community.

For HEIs, notwithstanding the effort that is currently being carried out regarding the R&D activity, the results are not strong enough to allow a truly impressive contribution to this industry:

> "*As the area of Tourism is not the most voted to research about, the main trends and statistical numbers are those that somehow end up building the consistency of the subjects. Great investment has recently been made in investigation production in this area, but very few results can be mentioned at this point.*" HEI A

Regarding the commercialisation of knowledge in the tourism sector, companies have suggested some solutions. Company A states that the knowledge produced should have practical applicability for the tourism companies, and it must be transformed into new technologies aiming at their licensing. Companies C, D, F, and G suggested the creation of regional networks for the tourism sector. Regional networks may be put into practice through the creation of incubators to welcome tourism startups. They believe that those companies located in incubators directly connected with the HEIs that study tourism will generate knowledge that will be put into practice more swiftly and efficiently. This way, the knowledge commercialisation may become a less bureaucratic process, faster and with practical applicability in the sector. Companies D and H also mention that tourism companies should commercialise the knowledge derived from R&D through world tourism networks, digital platforms, and local agents.

The commercialisation of the research covers strategies applied to intellectual property commercially explored and created through market mechanisms.

The research commercialisation includes patenting, licensing, spinouts, spinoffs, and other related business activities. The academic engagement channels involve interrelated collaborations with the knowledge of academic researchers of non-academic organisations, in contrast with a clearly defined market mechanism. The concept of academic engagement covers the dynamics of the collaborative research and the co-creation of knowledge together with strategic partners, which, therefore, sustain the Knowledge Transfer Networks. Academic engagement includes initiatives such as 'innovation vouchers', which provide short credit lines for the acquisition of services related to public knowledge providers, aiming at the introduction of operational innovations—new products, processes, or services (Lopes et al. 2018b; Sengupta and Ray 2017). In the tourism sector, patenting and licensing is more restricted because many companies work with services.

Concerning the creation of networks, three companies state that they are part of regional networks. Company A refers that it is still collaborating, in the scope of its activities, with other Science and Technology Campus companies where they are located. All the companies consider that the establishment of networks is important because it allows the sharing of knowledge and more promptness in the development of solutions. Managers think that their own companies become much more agile when they execute only part of the new product's creation. The definition of networks also allows them to reach markets that they would not get if they were operating alone. Companies C and F mention that the creation of networks in the tourism sector is crucial for the success of the sector's companies.

Networks are also important for HEIs:

> "The institution holds partnerships, not only because it is an institution that values benchmarking, the growth of the working area for itself, but also because it believes that partnerships carry advantages to all parties, according to the level of education rendered, such as the specificities of the scope and target audience. As the competence of the staff of an institution is a cornerstone for success. These outside professionals are seduced to become part of the faculty or participate in activities, feel that they are personally credited by the invitation to share with students, and build credibility by having them. These are also opportunities to attract companies and interns from side to side, as well as to open the door to hiring students in the future." HEI A

Participation in formal and informal networks helps create, develop, and disseminate knowledge in tourism companies (Baggio and Cooper 2010; Presenza et al. 2010). Personal and social relations play a fundamental role in the establishment of networks. Trust is the core element for establishing successful networks and the transfer of knowledge (Beesley 2005; Presenza et al. 2010; Xiao 2006).

It is worth mentioning that the three SMEs confirm they do not cooperate in R&D projects with HEIs because they point out there is not any openness to do it. These same three SMEs claim that they would not pay for R&D because they do not feel that need, not considering the costs involved. Academic research is generally seen by tourism professionals as tangential, unnecessarily complex, and communicated imperceptibly (Thomas 2012). Only one company would consider paying for R&D because it would accelerate the company's development.

The HEIs, in contrast with the results of the present study, aim at a collaboration with tourism companies. According to Thomas (2012), the HEIs state that there is a need to concentrate efforts in active participation inside appropriate networks, and to invest resources in the development of professional relationships. Consequently, it would be easier to find mutual interest areas (Sumarto Rumsari et al. 2020).

This open attitude is also found among HEIs, which enhance innovation, such as the elements that can benefit the most from this inter-institutional relationship:

"For any institution that wants to have a reputation within the trade, all kind of efforts to be part of innovative initiatives is advisable. And therefore, the Institution is quite active and interacts with many companies, has created a foundation that they sponsor, only to create not only an investigation routine but be requested to lead innovative projects for the community." HEI A

One of the important limitations to innovation in the tourism sector is the small size of the tourism companies and their fragmented nature. As a rule, the tourism sector networks are formed by micro-companies (Pikkemaat 2008; Thomas 2012).

Entrepreneurs in the tourism sector may benefit from the creation of cooperative networks with the stakeholders to develop their business ideas, as well as to ease the transfer of knowledge (Carlisle et al. 2013; van der Duim 2007), which is confirmed by the results of the present study. The cooperation between stakeholders in tourism companies is a prerequisite for the sustainable development of tourism (Albrecht 2013; Liburd and Edwards 2010).

Tourism SMEs claim that there are several barriers to the cooperation between tourism companies and HEIs: the cost, as tourism SMEs, usually, have very limited resources; the lack of interest from the HEIs; the bureaucratic processes; lack of incentives from both sides; the HEIs are not interested in studying young and academic tourism, considering that the studies in this segment are very scarce. The tourism companies suggest that the collaboration barriers may be overcome as follows: making the collaboration processes less bureaucratic; developing an intercommunication platform between the tourism companies and the HEIs where knowledge could be shared, and the interaction between the university and the industry could be more direct; development of ecosystems inside the HEIs to receive startups of the tourism sector.

From the SMEs point of view, the barriers that harm the collaboration between the university and the industry and the transfer of knowledge start with the guidelines of HEIs and their collaborators to the attitudes and behaviours of the HEIs administration and the TTOs team. There are also conflicts of interest related to patenting and licensing, which are not found in the tourism sector. The monetary benefits of patenting and licensing are important to the industry and the TTOs, while researchers are more interested in the visibility and reputation resulting from those activities. There are also conflicts related to whether the research results should be made public or private and if the research should be oriented to the publication or the technical application (Baycan and Stough 2013; David 2004; Markman et al. 2005).

HEIs also mention other possible barriers to the cooperation with the tourism sector's companies:

"If the institutions cannot rely on credited individuals to create sustained breakthrough investigation, the overwhelming intensity with which professionals of the trade work to sometimes denies them the availability to cooperate better. The goals of public and private institutions are sometimes not the same." HEI A

The SMEs that have participated in the study are unanimous in stating that HEIs may help tourism sector companies to create a competitive advantage in the market due to their knowledge, as stated by Soyer et al. (2020). Company A confirms its availability to disclose data gathered over the years to bring the HEIs closer to the tourism companies. Company A also claims that HEIs should let themselves be known to the companies, presenting services that they can provide. The other companies state that HEIs should enter the tourism networks, disclosing the results from the R&D activities they developed. Regarding tourism growth, companies B, E, G, and H think it is necessary to promote entrepreneurship in the tourism sector.

For HEIS, the best way to overcome the barriers that are preventing the institutions and the tourism sectors' companies from helping and cooperating is related to how the knowledge and capacities of the students who are moving from their study context to the labour market can be enhanced:

"The universities have to have confidence in their students' abilities and begin by choosing among the existing internships cooperative protocols that value mostly the students and make an example of them to other companies, describing better what is expected from the companies." HEI A

5. Conclusions and Implications

5.1. Summary and Implications of the Study

This study had two major goals: (1) to investigate how the knowledge transfer and commercialisation are made between the SMEs of the tourism sector and HEIs; (2) to check whether SMEs of the tourism sector are part of tourism networks as well as finding out their motivations. Moreover, this study has explored several gaps in the literature, thus contributing to a theoretical extension connected with the commercialisation and knowledge transfer in the tourism and tourism networks sector.

Relative to the first identified goal, our results suggest that knowledge transfer is not carried out properly from HEIs to the tourism SMEs. According to the SMEs, this is caused by the following: HEIs are not showing interest in the transfer of knowledge; it is a time-consuming process; the know-how taught at HEIs is insufficient and distant from the sector's reality; HEIs do not have proper infrastructures for a successful transfer of knowledge; HEIs only study leisure tourism in Portugal. On the other hand, HEIs identify other reasons for the difficulties of knowledge transfer: the courses cover disciplines from many different areas, making it difficult to manage; internships should have longer periods, and students must pass through all departments (which is not the case).

In this context, there is a need to bring SMEs closer to HEIs. The regional governments and the regional incubators must have a more active role in this process, promoting and organising activities/events to join the tourism SMEs with HEIs. Regional governments may create a support bureau for knowledge transfer and commercialisation, thus assuring a bridge between HEIs and SMEs. In recent years, the amount invested by policymakers in R&D is still residual. When we look, particularly in the tourism sector, we understand why knowledge transfer between HEIs and tourist companies is so deficient (Appendix B). For example, in 2019, only €35,991 were spent on R&D, representing 0.02 of GDP (DGEEC 2020).

HEIs may even disclose the data resulting from the investigation in a more simplified way for the local business fabric, thus reducing the waiting time for those results. HEIs should show that results that come from R&D are an added value for tourism SMEs, helping them reach a sustainable competitive advantage on a long-term basis. HEIs should also seek advice from the business fabric to adapt the contents to the real needs of the labour market. We recommend that HEIs strengthen or include content in tourism courses related to digital marketing tools.

On the other hand, SMEs must be available to welcome HEIs, providing them with all the information they have to assure that the R&D results are closer to reality. SMEs have to start considering R&D as an investment and not as a cost. SMEs want R&D outcomes to bring them short term results. However, medium/long term planning is crucial if they want to become more competitive. On the other hand, HEIs indicate that tourist SMEs do not have accredited individuals to develop and sustain innovative research. HEIs also indicate that the intensity of the companies' work in the sector can, at times, make the companies unavailable for cooperation.

Regarding the commercialisation of knowledge in the tourism sector, despite the difficulties identified, because the majority of tourism SMEs commercialise services, some measures were suggested: the generated knowledge must have practical applicability for the tourism companies, and it should be transformed into new technology that could be licensed (technology licensing); the knowledge resulting from R&D should be commercialised through world tourism networks, digital platforms, and local agents. HEIs have to transfer their knowledge for the region's companies through several agreements, such as

knowledge transfer deals with regional governments, providing consultancy experience that their students can carry out (Carlisle et al. 2013; Tiffin and Kunc 2011).

As far as the second goal is concerned, tourism SMEs, as a rule, are part of regional networks with other companies. Tourism SMEs consider it important to establish networks because they allow the sharing of knowledge, more swiftness in the development of solutions, and think their own companies become more agile when they execute only part of the creation of new products. The definition of networks also allows them to reach markets that alone they would not get to. The cooperation of tourism SMEs is a prerequisite for sustainable tourism development (Albrecht 2013; Liburd et al. 2020; Liburd and Edwards 2010; Nguyen et al. 2020).

Despite what was previously stated, tourism SMEs do not cooperate with HEIs in R&D projects in general. They state that they cannot find openness to do it. It was also confirmed that most tourism SMEs wouldn't pay for R&D because they do not feel that particular need, not considering the costs implied in the process, which reinforced the results obtained in the first objective.

According to the results and the suggestions above mentioned, we suggest a model that accelerates the commercialisation and transfer of knowledge between SMEs of the tourism sector and HEIs (Figure 1).
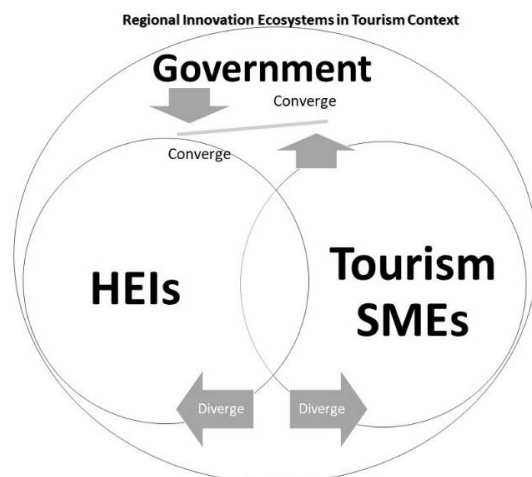
Figure 1. Triple Helix in Tourism Context.

As can be confirmed in Figure 1, the Triple Helix model was adopted in the tourism sector. With this model, the 'Triple Helix in Tourism Context', although the tourism sector SMEs and the HEIs diverge, without the existence of interception, the regional government may be the mediator, thus allowing a convergence between the SMEs and the HEIs. This way, the tourism sector SMEs and HEIs will increase their interactions. With this process, they will fasten the commercialisation and transfer of knowledge and become more competitive in the tourism sector. Besides being moderators and organising activities to bring the stakeholders closer, regional governments may even create incubators specifically dedicated to the tourism sector (considering it is one of the intelligent specialisation domains selected by the RIS3 of the Portuguese regions). They can also create governmental TTOs to intermediate the negotiations of the commercialisation and transfer of knowledge between the tourism sector SMEs and the HEIs.

5.2. Limitations and Future Research

The limitations of the present study are inherent to the qualitative methodology. The results obtained cannot be generalised because they show the reality of the tourism sector within the context of the study. Therefore, the data cannot be extrapolated. Eight tourism SMEs have participated in this study, which is not a representative sample of the sector.

Quantitative studies should also be carried out to confirm or refute the results of the present study. More qualitative studies should be made in similar contexts, thus allowing comparison of the results. The themes studied should be extended to the regional governments and HEIs, to incorporate the vision of all players. The positive and negative impacts of tourism in the regions should also be studied, presenting solutions and recommendations to the SMEs and regional governments. Finally, HEIs should study young/academic tourism and artificial intelligence and machine learning in the tourism sector.

Appendix A. Questions Included in the Interview

Company name:
Foundation year:
Respondent's name and professional category:
Address:
Billing volume 2018:

Questions (1–16) in this questionnaire can be found at Lopes and Farinha (2020).

1. How many employees does your company have?
2. How many company employees have a university degree?
3. Are there policies to encourage higher education in the company?
4. Is it easy for the company to attract young talents trained in higher education institutions?
5. What are the main gaps that trainees bring from higher education institutions?
6. What is it that higher education institutions' human resources trained in tourism add to the company again?
7. Do you consider that networking creates value for your business?
8. Would you consider being part of a regional innovation ecosystem?
9. What business and cooperation networks would you like to integrate?
10. What are the main difficulties encountered in transferring knowledge in the tourism sector between companies and higher education institutions?
11. Does the company collaborate in research and development (R&D) projects with higher education institutions?
12. Would the company consider paying research and development (R&D) to higher education institutions?
13. What are the barriers to university-industry collaboration in the tourism sector?
14. How can we overcome the barriers encountered for university-industry collaboration in the tourism sector?
15. What topics in the tourism sector should be explored by higher education institutions in research and development (R&D) activities?
16. How can higher education institutions help tourism companies create value and competitive advantage in the marketplace?

Appendix B. R&D Expenditure in Portugal, from 2014 to 2019

Table A1. R&D Expenditure in Portugal, from 2014 to 2019.

Thematic Area.	R&D Expenditure																							
	2014				2015				2016				2017				2018				2019			
	Thousands of €	% in National Total	% of GDP	Euros Per Inhabitant	Thousands of €	% in National Total	% of GDP	Euros Per inhabitant	Thousands of €	% in National Total	% of GD2	Euros Per Inhabitant	Thousands of €	% in National Total	% of GDP	Euros Per Inhabitant	Thousands of €	% in National Total	% of GDP	Euros Per Inhabitant	Thousands of €	% in National Total	% of GDP	Euros Per Inhabitant
National Total	2,232,249	100	1.29	215	2,234,370	100	1.24	216	2,388,467	100	1.28	232	2,585,100	100	1.32	251	2,769,602	100	1.35	270	2,991,864	100	1.40	291
Tourism	20,854	1	0.01	2	30,739	1	0.02	3	31,133	1	0.02	3	34,904	1	0.02	3	35,619	1	0.02	3	35,991	1	0.02	3

Source: https://www.dgeec.mec.pt/np4/1227.html, consulted on 21 April 2021.

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