The Invisible College of eTourism: A Case of ENTER Conference

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Abstract

ENTER conference is often regarded as the major force behind the formation of eTourism research community. Within the previous 21 years, 1386 researchers from 45 countries have presented their latest research works in this conference. The scientific community created by this conference is the backbone of eTourism research. The highly productive and well-connected members of this community form an *invisible college* of this academic field. Using social network analysis this study aims to shed some light on the structure of this research community. By integrating evaluative and relational bibliometric approaches, this paper aims to identify the leading researchers based on their research productivity and illustrates their fundamental position in the domain of the vast knowledge network established by this conference. The findings of this research help researchers to understand the structure of research collaborations in this field and identify the leading researchers in the eTourism academic society.

Keywords: Co-authorship; ENTER conference; research collaboration; eTourism; social network analysis; bibliometrics.

1 Introduction

The *invisible college* is defined as the group of *interconnected* and *international* researchers who *collaborate* in the development of research in an academic field (Price & Beaver, 1966, p. 1011). Crane (1969, pp. 335-336) further revealed the existence of such a *social organisation* and discussed that *social ties* among its members can be of informal communication or *formal collaboration* in nature. She further discussed that the latter may occur in several ways such as *co-authorship*, supervision and intellectual linkage in the form of citation. Racherla and Hu (2010, p. 1015) argued that the development of knowledge is the result of a social process, thus members of the invisible college and their social ties play a crucial role in the development of an academic field and are crucial for sustaining a research domain (Hu & Racherla, 2008). Investigating the structure of such connections therefore contributes to the better understanding of the patterns and dynamics of knowledge creation and diffusion as well as identification of the key actors behind the development of an academic field. Social Network Analysis (SNA) is found to be an effective tool for such an investigation (Baggio, Scott, & Arcodia, 2008; Benckendorff, 2010).

Bibliometrics as the analytical methods to measure the properties of published documents (Benckendorff, 2009) has been commonly used in understanding the domain of tourism (Benckendorff & Zehrer, 2013) and assess the research trends (Ying & Xiao, 2012, p. 450). The purpose of these studies can be either evaluative or

relational (Benckendorff, 2009, p. 2). The former group of research aims to evaluate the impact and/or productivity of research while the latter group investigates the relational structure of a research field (Benckendorff & Zehrer, 2013, p. 126). While the number of such research in the general domain of tourism is growing (Lee, Au, Li, & Law, 2014; Ye, Li, & Law, 2013), the number of bibliometric research investigating the research collaboration in the specific domain of eTourism is limited. Leung and Law (2006) and Leung and Law (2007) reviewed the authorship of papers in the periods of 1985 to 2004 and 1986 to 2005. More recently; Li, Buhalis, and Zhang (2013) used a systematic review to investigate the Chinese and English eTourism research papers from 2000 to 2011. The current study aims to extend the existing literature by analysing the co-authorship pattern and research collaboration structure in the 972 papers published in ENTER conference and identify the elite group (Egghe, 1987) of *productive* and *connected* scholars who played a crucial role in the progress of research in this academic field.

2 Research method

Following the previous tourism researchers (Baggio et al., 2008; Benckendorff, 2009, 2010; Benckendorff & Zehrer, 2013; Racherla & Hu, 2010; Ye, Song, & Li, 2012) this study uses SNA to analyse the co-authorship network of eTourism researchers. Bibliometric data of 972 papers published in the previous 21 issues of ENTER conference proceedings have been collected. Price's (1963) Law as explained by Egghe (1987) was used to initially determine the size of the *elite group*. Following previous researchers (McKercher, 2007) this study uses publication count as an indicator for productivity and elitarism. Within the scope of SNA, as per suggestion of Racherla and Hu (2010), the notion of structural hole, in addition to other SNA measures, is used as the main indicator of connectedness to evaluate the authors' centrality and strategic position within the scientific community.

3 Results and Analysis

Within the previous 21 years 1386 authors contributed in the creation of 972 research papers. The contribution count of authors follows a power law distribution. Price's (1963) law suggests that the top N^{α} ($0<\alpha<1$) authors (elites) produce a fraction θ ($0<\theta<1$) of the papers made by total of N authors in any academic society while $\theta \approx \alpha$. The results of this study finds $\theta=0.67\approx0.66=\alpha$ is applicable as 66% of the papers have been produced by less than 9% of the authors. Racherla and Hu (2010, p. 1020) specify that power law distribution is a feature of large networks due to two factors of the continuous growth of the network and the new authors' preference to collaborate with the well-connected authors. However the average number of collaborators in this study is significantly higher than previous research investigating journal papers. The average *degree centrality* in this study is 4.18 compared to 2.58 in and 2.9 in Benckendorff (2010) research. The network of the main component is illustrated in Fig. 1 and the metrics of whole network are presented in Table 1.

Table 1: Overall network metrics

Papers	972

Authors (nodes)	1386
Mean paper per author (overall)	1.83
Mean author per paper (overall)	2.61
Number of components	251
Main component size	572
Links (collaboration relationships)	2895
Isolates (non-connected authors)	72
Mean degree centrality (collaborator per author)	4.18
Density	0.003
Mean distance	5.119
Mean betweenness (normalised)	0.051
Mean effective egonet size	1.7
Mean 2step reach	1.16

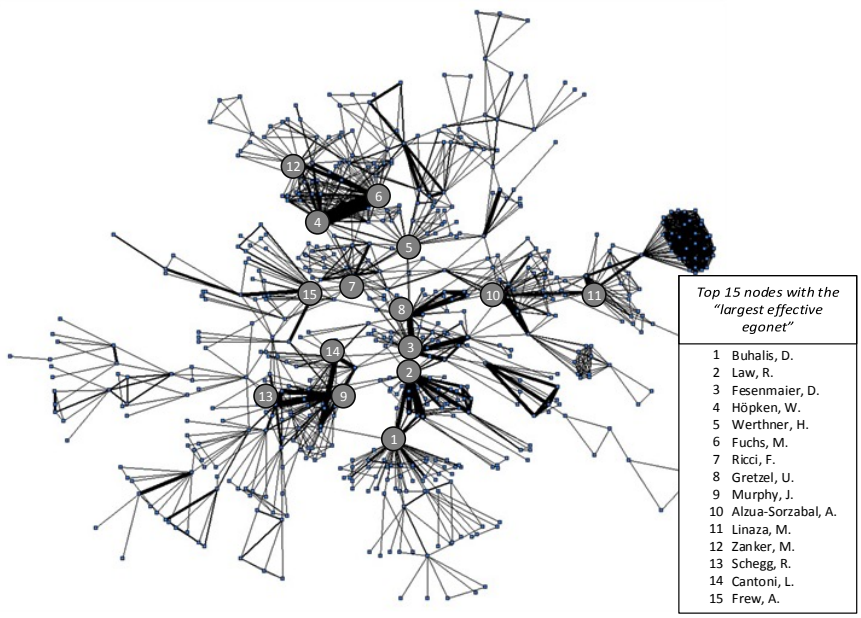

Fig. 1. The graph of the main component. Ties' width indicates the collaboration frequency. Top nodes based on the effective egonet size are marked.

The main components encompass 572 authors who are connected to the main body of network at least through collaboration with one other author. The ties' width in Fig. 1 represents the frequency of collaboration, thus a number of strong collaboration patterns can be seen. While a common way to evaluate the connectedness of an author is to count their direct collaborations with other authors, some nodes appear to have a more fundamental position in maintaining the cohesion of network than others. There are several measures to determine this strategic position. One is Burt's (2009) notion of structural holes, a term to refer to the positional advantage and disadvantage of individuals in a network. Racherla and Hu (2010, p. 1026) elaborate that the actors located on the structural holes benefit from a privileged position which represents their potential for gaining social capital and ability to use the available resources possessed by the members of their vast network. These actors play a crucial role in

making connections between other researchers in the network. To determine the positions of the structural holes in the network, the effective size of the egonet of the actors (Burt, 2009; Racherla & Hu, 2010) can be used. This study uses this approach to evaluate the *connectivity* of the researchers and their strategic position. The locations of the top 15 structural holes are marked in Fig. 1 as an example.

4 Conclusion

The study found the co-authorship pattern in eTourism research in this conference has had a faster increasing trend compared to tourism and hospitality journals. The main purpose of this study however was to identify the leading *productive* and *connected* scholars whom can be regarded as the faculty of invisible college of eTourism. And have been the major force of the development of eTourism from the perspective of ENTER conference. Using authors' contribution count as the indicator of *productivity* and their effective size of egonet, as the indicator of *connectivity,* 52 researchers have been identified as the leading *productive* and *connected* researchers based on their research publication in the ENTER conference, the location of top 15 researchers have been illustrated in Fig. 1. The findings of this research help emerging researchers to understand the structure of research collaborations in the field of eTourism and assist the current members of eTourism academia to gain a broader picture of the eTourism knowledge network and identify the potential for expanding their research collaboration ties. It also enables them to strategically position themselves within this network to increase their research productivity and intellectual connectivity. This study looked at the structure of eTourism research collaboration from the perspective of ENTER conference while the notion of research collaboration encompasses a very broad range of informal and formal communication. Further research is required to examine the pattern and structure of research collaboration conveyed through other forms of scientific communication, such as journal papers. Furthermore co-authorship analysis is only one of the objective methods to investigate the scientific collaboration in a research field. The findings of this research should be further compared and extended by using other bibliographic analysis methods such as citation, co-citation and expert panels. While authors have dedicated substantial time and effort to correct and standardize the discrepancies in the bibliometric data, some data discrepancies might have been remained undetected, specifically due to the potential change of the surname of an author or variation in its spelling. The most significant limitation of this research is in its limited scope of analysis. The measures of productivity and connectivity introduced in this paper merely reflect the academic activity of scholars within the scope of ENTER conference. Thus this paper does not reflect the overall productivity or connectivity of researchers; therefore the findings must be interpreted only from the perspective of this conference, as the main research platform of eTourism. For the generalisation of findings of this research, the same approach used in this study can be applied to an extended database, particularly including the papers published in the leading journal articles to create a broader picture of the research collaboration in this field.

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