






Analyzing Individual, Institutional, and Regional Contributions to E-tourism: The Case of ENTER Proceedings (1996–2021)

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Abstract. ENTER conference is an annual international event organized by the International Federation for Information Technology and Travel and Tourism (IFITT). Since 1994, this conference has been providing a platform for academics, industry practitioners, governments, and other organizations to share their research about information and communication technologies application in tourism. In the conference, the IFITT community mainly focuses on three streams, namely, research, destinations, and industry. The studies presented at the ENTER conference were published in the content of ENTER proceedings. The current study analyzes the proceedings published from 1996 to 2021 (i.e., 26 issues) to understand the individual, institutional, and regional contributions to e-tourism within these 26 years.

Keywords: ENTER conference · IT · Tourism · Authors · Institutes · Regions · Contribution

1 Introduction

Conventional industries have been changed by the evolution of information and communication technologies (ICT), in terms of product development and consumption. Therefore, new business models are needed in the tourism industry [1]. Technologies are also transforming tourism management and marketing strategies. To obtain a complete view of the influence of technological advances on the tourism industry, continuous and innovative tourism technology research effort is needed [2]. Before the 1990s, very limited contributions to tourism and technology were published. Since 1994, the ENTER conference annually offers a forum for academics, practitioners, governments, and organizations to share their latest research findings of information and technology in the tourism industry [3, 4]. As the leading international academic conference on tourism and technology, ENTER provides a platform for professional

researchers in publishing quality research articles. Aiming to provide a general view of authors' contributions to this research realm in ENTER conferences, this study reviewed the accessible 26 issues of conference proceedings from 1996 to 2021. A total of 1,217 research papers were incorporated into the analysis, with 1,697 individual authors who were affiliated to different regions/countries of continents. Individual, institutional, and regional contributions to information and technology in the tourism industry in the recent 26 years are presented in this study.

2 Literature Review

2.1 Research Productivity Analysis

Van Over and Nelson [5] indicated that identifying and evaluating major research contributions are periodically necessary to record the historical evolution and provide a sense for future study. The tourism and hospitality academic community devoted the greatest efforts to conducting research [6]. Although the importance of research is recognized, no common ways are adopted to evaluate research performance in hospitality and tourism research [7]. Harris [8] stated that four different methods can be used to measure research performance, namely, impact, quality, importance, and quantity. Impact represents the influence level of a related article. Importance and quality are evaluated by reviews and value judgments so that the results are subjective particularly when the academic research output is evaluated in different periods of time. Then, quantity is the most pragmatic way to measure research productivity, that is, by counting the number of publications issued. In the field of tourism and hospitality, authorship and institution analyses are frequently used to assess research performance by counting the number of publications [6, 7, 9–11]. Prior tourism review research seldom evaluated productivity on specific areas, such as information technology (IT) in tourism [12].

2.2 IT in Tourism Research

Since the 1980s, ICT has started influencing the tourism industry in terms of business practices, marketing strategies, and industry structure [13]. More importantly, the implementation of technologies is an effective strategy to enhance tourist destination competitiveness [14]. By serving as an effective liaison among heterogeneous stakeholders, ICT promotes the information exchange of the tourism ecosystem and therefore fosters globalization [15]. With the evolution of technologies, such as 5G, Internet of Things, blockchain, and augmented reality, tourism is transforming from eTourism to smart tourism and then to the forthcoming ambient intelligence tourism [14]. The successful technology adoption in the tourism industry not only enhances the tourist experience but also promotes the sustainable development of the destination by assisting better resource management [16]. This irreversible development trend has a disruptive influence on the tourism industry and therefore has attracted significant attention from scholars, practitioners, and governments [4].

The literature reflects that very limited studies related to tourism and technology were published before 1990. In 1994, the annual ENTER conference gathered researchers who

share multiple interests in tourism and IT development to exchange their research findings. This group of researchers constituted a research community called the International Federation of Information Technology for Travel and Tourism (IFITT) [3, 4]. Since then, a proliferation of IT and tourism research is witnessed [17]. Key review studies can help academics keep pace with the state-of-the-art IT and tourism research [18]. For example, Buhalis and Law [4] reviewed the development progress of IT in tourism research in the past 20 years before 2008. In addition, Law, Qi, and Buhalis [19] summarized the tourism website evaluation research in the past 15 years (i.e., from 1996 to 2009). Leung, Law, van Hoof, and Buhalis [20] focused on emerging social media-relevant tourism research. Moreover, the recent decade witnessed several IT and tourism systematic reviews that analyzed the categorization of pertinent research themes, development trends, and co-authorship of key researchers [17–21]. Although several review papers provided an outline of the development of IT and tourism research, conference papers were usually excluded from the analyzed scope. Therefore, considering the limited understanding of research productivity and individual and institutional contributions to IT and tourism research, ENTER conference proceedings from 1996 to 2021 were analyzed to provide a wider view for academics, industry practitioners, and governments [12].

3 Methodology

In this study, the articles published in the Information and Communication Technologies in Tourism: Proceedings of the ENTER conferences (1996–2021) were examined. During this period, a total of 1,217 research papers were included in ENTER proceedings, comprising full- and short-length articles.

This study is regarded as an extension of the previous study [12] to update the trend of contribution in past decades. Publications in ENTER proceedings were analyzed by year to determine the trend of contribution in terms of region, individual author, and institute. In addition to the publication counting method adopted by previous research, this study used the same method advised by Sheldon [6] in analyzing authorship. To analyze the tourism research contributions, two measurements were calculated: instances and weighted instances. The former represents the number of articles an author contributed either partially or fully. The latter prorates the partial contribution of co-authors by using equal weight [6]. Although first authors may have contributed more than other authors, weighted instance assumes that each co-author's contribution to the research is equal.

4 Findings and Discussions

4.1 Distribution of Papers by Year

From 1996 to 2021, a total of 1,217 research papers were included in the ENTER conference proceedings, comprising full- and short-length papers. The average number of papers per year is 46.8. In the first 10 years from 1996 to 2005, the number of articles gradually increased from 25 to 51. Then, from 2007 to 2013, the number of

papers dropped and fluctuated between 42 and 50. In 2014, a total of 65 research papers were published. The number of published articles reached its peak and then dropped significantly to the lowest point in 2020 (i.e., 25 papers). In 2021, the article number rebounded back to 55. Figure 1 shows the trend of publication within 26 years.

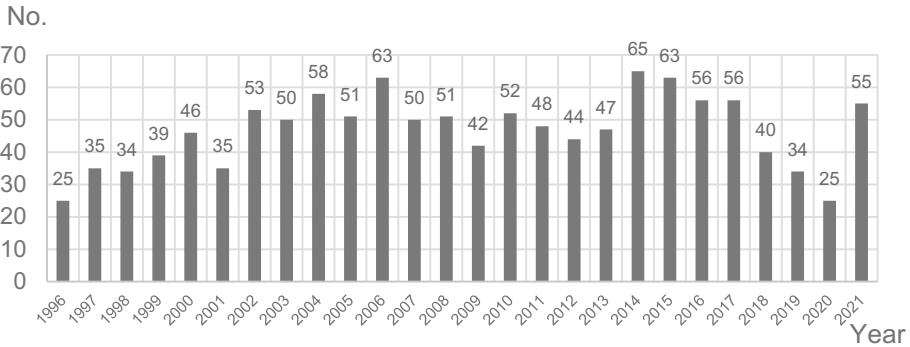


Fig. 1. Distribution of papers in 1996–2021

4.2 Research Contributions by Continent/Country/Region

As shown in Table 1, Europe is the most productive continent at the ENTER conference with a total of 2,257 (69.17%) published papers in instances and 830.96 (68.56%) papers in weighted instances. Liu, Zhong, Ip, and Leung (2011) found that, until 2010, America was the second-largest contributing region [12]. After a decade, however, Asia’s contribution rapidly increased and became the second-largest contributing region with 433 (13.27%) papers in instances and 146.93 (12.12%) papers in weighted instances. America ranked third with 351 (10.76%) papers in instances and 144.00 (11.88%) papers in weighted instances. Oceania ranked fourth, with a total of 197 papers in instances and 77.78 papers in weighted instances and contributed 6.04% and 6.42% to the analyzed realm. Of all publications, Africa was the least productive continent providing 0.77% in instance and 1.02% in weighted instance.

The results of the top three productive countries are in line with the findings of 10 years ago [12]. Considering the cradle of ENTER conference, in the past 26 years, the majority of the authors were from Austria. They contributed to the conference by publishing a total of 497 (15.23%) papers in instances and 173.94 (14.35%) papers in weighted instances. The second-largest contributing country was the United Kingdom, with 378 (11.58%) published papers in instances and 170.62 (14.08%) papers in weighted instances. The United States was the third one with 313 (9.59%) papers in instances and 130.35 (10.75%) papers in weighted instances. Table 1 shows the details of contributions provided by other countries and their ranks.

Table 1. Research contributions by geographic region

Continent/ Country/ Region	Instances				Weighted Instances			
	Number	World Rank	Rank in the Continent	%	Number	World Rank	Rank in the Continent	%
Europe	<u>2,257</u>	<u>1</u>		<u>69.17%</u>	<u>830.96</u>			<u>68.56%</u>
Austria	497	1	1		173.94	1	1	
UK	378	2	2		170.62	2	2	
Switzerland	287	4	3		91.34	5	4	
Italy	280	5	4		95.43	4	3	
Spain	274	6	5		77.29	6	5	
Germany	158	8	6		59.03	8	6	
Finland	71	12	7		28.05	10	7	
The Netherlands	56	13	8		17.53	15	10	
Greece	55	14	9		25.12	11	8	
Sweden	45	16	10		15.24	18	12	
France	37	17	11		19.33	14	9	
Norway	36	18	12		16.83	16	11	
Estonia	17	21	13		5.00	26	16	
Denmark	16	23	14		10.08	21	13	
Portugal	13	26	15		5.50	25	15	
Belgium	12	27	16		6.92	23	14	
Ireland	7	30	17		2.87	31	18	
Croatia	6	31	18		4.00	28	17	
Yugoslavia	4	33	19		1.00	36	20	
Bulgaria	2	37	20		1.00	36	20	
Slovenia	2	37	20		2.00	33	19	
Cyprus	1	42	22		0.33	47	25	
Iceland	1	42	22		1.00	36	20	
Poland	1	42	22		1.00	36	20	
Serbia	1	42	22		0.50	44	24	
Asia	<u>433</u>	<u>2</u>		<u>13.27%</u>	<u>146.93</u>	<u>2</u>		<u>12.12%</u>
Hong Kong	158	8	1		58.05	9	1	
South Korea	83	10	2		23.63	13	3	
Japan	75	11	3		24.50	12	2	
China (Mainland)	51	15	4		15.75	17	4	
United Arab Emirates	14	24	5		5.95	24	5	
Macao	14	24	5		5.00	26	6	
Malaysia	12	27	7		3.68	30	8	
Taiwan	11	29	8		4.00	28	7	
Turkey	6	31	9		1.53	35	11	
Israel	4	33	10		2.33	32	9	
Thailand	4	33	10		2.00	33	10	
Oman	1	42	12		0.50	44	12	

America	<u>351</u>	<u>3</u>		<u>10.76%</u>	<u>144.00</u>	<u>3</u>		<u>11.88%</u>
USA	313	3	1		130.35	3	1	
Canada	35	19	2		12.90	19	2	
Brazil	2	37	3		0.50	44	3	
Mexico	1	42	4		0.25	48	4	
Oceania	<u>197</u>	<u>4</u>		<u>6.04%</u>	<u>77.78</u>	<u>4</u>		<u>6.42%</u>
Australia	170	7	1		66.95	7	1	
New Zealand	27	20	2		10.83	20	2	
Africa	<u>25</u>	<u>5</u>		<u>0.77%</u>	<u>12.33</u>	<u>5</u>		<u>1.02%</u>
South Africa	17	21	1		8.67	22	1	
Nigeria	3	36	2		1.00	36	2	
Egypt	2	37	3		1.00	36	2	
Morocco	2	37	3		0.67	43	5	
Namibia	1	42	5		1.00	36	2	

4.3 Research Contributions by Individual Authors

Authors’ contributions to the ENTER conference from 1996 to 2021 are demonstrated in this section. In conformity with Liu, Zhong, Ip, and Leung [12], this study also adopted the classification suggested by Sheldon [6] and Jogaratnam et al. [10]. Therefore, three types of authors exist, namely, one-time, moderately contributing, and intensely contributing authors [6–10]. The one-time author refers to an author who only contributed one article. The moderately contributing author represents an author who contributed two to four times. Finally, the intensely contributing author represents an author who contributed five times or above. Table 2 shows the research contributions by these three types of individual authors.

From 1996 to 2021, a total of 1,697 individual authors participated in ENTER conferences. Most of the papers were contributed by 1,250 one-time authors (73.66%). The number of moderately contributing author was 337 (19.86%). In addition, a total of 110 (6.48%) authors intensely contributed to this conference.

Table 2. Research contributions by individual authors

Total number of authors	One-time authors		Moderately contributing authors		Intensely contributing authors	
	Number	%	Number	%	Number	%
1,697	1250	73.66	337	19.86	110	6.48

Table 3 lists the top 30 intensely contributing authors. The top three contributors were Dimitrios Buhalis, Rob Law, and Daniel R Fesenmaier, with 57, 56, and 40 papers in instances among 26 issues. Apart from the number of papers, Table 3 also shows the first year of the contribution of each author to clearly reflect their seniority in the ENTER conference (Table 4).

Table 3. Top 30 intensely contributing authors

Author	First year of contribution	Instances		Weighted instances	
		Number of papers	Rank	Number of papers	Rank
Dimitrios Buhalis	1996	57	1	24.33	1
Rob Law	2000	56	2	20.72	2
Daniel R Fesenmaier	1996	40	3	17.15	3
Ulrike Gretzel	2000	35	4	14.12	6
Lorenzo Cantoni	2009	30	5	10.40	8
Wolfram Höpken	1999	26	6	8.15	12
Matthias Fuchs	2005	26	6	6.70	17
Jamie Murphy	2003	25	8	7.07	16
Roland Schegg	2002	24	9	7.57	14
Aurkene Azua-Sorzabal	2005	22	10	5.55	21
Iis P Tussyadiah	2007	21	11	11.75	7
Francesco Ricci	2001	21	11	7.52	15
Peter O'Connor	1998	19	13	14.83	5
Andrew J Frew	1997	19	13	8.92	10
Hannes Werthner	1996	19	13	8.26	11
Zheng Xiang	2004	19	13	7.78	13
Roman Egger	2007	19	13	6.38	18
María Teresa Linaza	2005	19	13	5.24	23
Marianna Sigala	2000	19	13	15.00	4
Miriam Scaglione	2004	18	20	5.78	19
Alessandro Inversini	2009	16	21	5.12	24
Elena Marchiori	2009	16	21	4.90	26
Namho Chung	2013	15	23	4.25	29
Rodolfo Baggio	2003	14	24	5.75	20
Chulmo Koo	2013	14	24	3.62	30
Rosanna Leung	2006	13	26	4.67	27
Markus Zanker	2006	13	26	3.41	31
Karl Wöber	1994	13	26	9.78	9
Astrid Dickinger	2006	12	29	5.37	22
Timothy Jung	2000	12	29	5.00	25

4.4 Research Contributions by Institutes

Table 4. Research contributions by the top 10 research institutes

Institute (Country/Region)	First Year of contribution	Instances	Rank	Weighted instances	Rank
The Hong Kong Polytechnic University (HK)	2000	147	1	50.15	1
University of Surrey (UK)	1996	112	2	43.75	2
Bournemouth University (UK)	2008	78	3	30.92	3
Kyung Hee University (South Korea)	2013	68	4	18.73	5
Università della Svizzera italiana (Switzerland)	2010	60	5	20.57	4
University of Trento (Italy)	2000	56	6	14.02	9
CIC tour GUNE (Spain)	2008	49	7	12.07	10
MODUL University Vienna (Austria)	2008	46	8	18.28	7
Salzburg University of Applied Science (Austria)	2007	44	9	11.22	11
University of Illinois (USA)	1996	44	9	18.70	6
Temple University (USA)	2005	39	11	16.20	8

This study recognized that the trend of publications on IT and Tourism changed in recent decades. From 1994 to 1999, the United Kingdom made the largest research contribution in the ENTER conference, which was followed by Austria, Germany, the USA, and the Netherlands [22]. However, the ranking was slightly different from that in the past because of the engagement of industry practitioners from Austria and Italy. From 1994 to 2010, Austria became the most productive country, followed by the UK, the USA, Italy, and Germany. The findings of this study pointed out that in the past decade, the top three contributing countries were the same. Moreover, the research productivity of Switzerland and Spain has increased. In general, the contribution of Asia was increasing year by year, particularly in the past 10 years. Research contributions from The Hong Kong Polytechnic University (HK) and Kyung Hee University (South Korea) surged.

5 Conclusions

5.1 Summary of the Study

IT plays an important role in the tourism and hospitality industry. To gain additional knowledge about current situations and to predict future trends, continuous academic research in IT applications on tourism is essential. This study has examined the

individual, regional, and institutional contributions to IT and tourism research by analyzing the articles published in ENTER proceedings from 1996 to 2021. A total of 1,217 research papers were contributed by 1,697 individual authors in the past 26 years. The total number of research contributions increased year by year. Regarding the regional contributions, Europe was the most productive continent, followed by Asia, America, Australia, and Africa. Specifically, Austria had the largest research contribution by issuing 497 articles in instances. As for institutional contribution, the Hong Kong Polytechnic University (HK) was the most prolific institute, with a total of 147 research articles when counting in instances, followed by the University of Surrey (UK) and the Bournemouth University (UK). Regarding individual contributions, the top three authors were Dimitrios Buhalis, Rob Law, and Daniel Fesenmaier, and the years they started contributing to ENTER conferences varied (since 1996, 2000, and 1996 respectively).

5.2 Implications

The development of IT promotes the evolution of the tourism industry, which has disruptive effects on tourism management, marketing, and destination competitiveness [14]. This study aims to provide insights for academics, practitioners, and government officials to deeply understand the trend of productivity on IT and tourism research. The findings of this study updated the research performance of individuals and institutes. The increasing number of published articles may motivate practitioners to pay additional attention to the importance of IT in the tourism industry.

In terms of theoretical implications, this study extends the IT and tourism research by conducting a productivity analysis. Publications in the ENTER conference proceedings from 1996 to 2021 were selected as the research scope, which bridges the previous research gap. The results quantified the research contribution of individuals, institutions, and regions.

Several practical implications are provided. The ranking of individual and institutional contributions may be regarded as a reference for organizations and educational institutions, particularly for the recruitment of researchers. Research institutes may determine remuneration packages by reviewing candidates' research contributions in these fields. We believe that this research finding may help recruit high-quality candidates.

Apart from recruitment purposes, this study also reflects the institutional research contribution in the IT and tourism industry. For those who are planning for their higher education or career path, the findings may help them select professional and high-quality institutes.

Based on the findings, the ENTER conference has recently gained momentum in internationalization. In the past decades, most participants came from Europe and North America. However, the findings show that the research contribution of Asia has largely increased in the recent decade. The research contribution not limiting to specific regions made this conference more globalized. Advanced technology development in Asia, particularly in Mainland China, is recognized by the world, for example, the 5G development is a popular topic nowadays. We believe that this technology transformation might create a significant influence on the tourism industry and provide a new

direction for academic research. In addition, the ENTER conference 2022 will take place in Mainland China, indicating the growing significance of Asia, and the growing number of Asian participants would be promising.

Finally, this study attempts to appeal attention to IT and the tourism industry. Academics are encouraged to initiate additional international collaborations and contribute to knowledge development. In addition, to increase the impact of research, collaborations among academics, practitioners, and governments are recommended.

5.3 Limitations and Future Studies

This study has some limitations. First, from 1994 to 2021, a total of 28 ENTER proceedings were published. However, this study only analyzed 26 issues (1996–2021) of ENTER conference proceedings because of the inaccessibility of proceedings in 1994 and 1995. In addition, some promising and productive young scholars that started to participate in the ENTER conference in recent years are not noted in this study. Thus, in future studies, researchers are suggested to complete and update the result of the findings. Second, in terms of the analyzed content, although this study provides the first year of contribution as a reference, the analysis did not delve into this part. Readers might take this component into account when evaluating author's contribution. Moreover, the popularity such as Google Scholar's h-index of some prolific authors can be provided for comparison in a future study. Third, in comparison to the institutional contribution, the findings of individual productivity were more accurate to reflect the fact. The reason is that job switching of researchers can influence the productivity of institutes, particularly for authors with a high level of contribution. Meanwhile, there may be some missing articles because of the changes of the official name of institutions. For example, Università della Svizzera italiana (Switzerland) is also called University of Lugano. Therefore, changes of author's affiliation and institution names should be considered in future research. Finally, the results only reveal the contribution of authors who published articles in ENTER conference proceedings. Articles published in other pertinent journals, conferences, and books are recommended to be incorporated into analysis for generating a comprehensive result.

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