Bibliometric Visualization: An Application in Tourism Higher Education Research

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ABSTRACT

Higher education in tourism plays an important role in tourism industry development, while few studies have utilized bibliometric visualization method to explore this research area. A total of 349 papers related to higher tourism education were identified and a set of high frequency word analysis, co-occurrence analysis, and co-cited analysis was applied. There are three main research topics including specializing in trade, tourism students' attitude, and study motivation in this field, while more scholar collaborations can improve this research depth.

Keywords: tourism higher education, bibliometric visualization, CiteSpace

I. INTRODUCTION

Tourism and hospitality has been recognized as in international fast-growing industry to contribute to a significant economic growth (Szivas, Riley, & Airey, 2003). Meanwhile, the hospitality and tourism industry confronts the issue of efficiency and productivity (Davidson, Timo, & Wang, 2010). How to support fast tourism and hospitality development through education is significant.

The potential labor quality plays an important role in tourism industry management and higher education affects the support of professions and sustainability of tourism industry development. However, few studies reviewed the previous literature to provide an overall view of this research area. Moreover, qualitative research of literature review reveals focused topics and provides an insight into relationships and trends of previous studies (Leung, Sun & Bai, 2017). With bibliometrics tools, the current study aims to review previous studies in higher education in tourism and hospitality systematically.

II. LITERATURE REVIEW

High frequency keyword analysis was selected to analyze most popular research topics based on the statistics of frequency of keywords (Yuan, Lan, Hao, & Zhao, 2019). Based on the statistical results high frequency keywords, co-occurrence analysis and word matrix is built to construct Co-word analysis to show the relationship between hot research topics (Fu, Hu, Wang, Feng, et.al., 2015). Co-authorship analysis identifies the collaboration patterns between authors in related research field which reveals the depth of research (Jiang, Ritchie, & Benckendorff, 2019). Co-

citation analysis, as a common bibliometric analysis method (Ding, Chowdhury, & Foo, 2001) provides insights into most important research by defining two research cited together in one article and intellectual structure of related scientific research can be identified (Leung, Sun, & Bai, 2017). Meanwhile, based on this content analysis method, CiteSpace uses a cluster detection algorithm to identify hot and emerging research trends or topics of published articles.

III. METHOD

A. Data collection

This paper adopts Cite space 5.6 R4 to analyze and visualize the studies published in a touristic higher education related field. Based on the keywords 'tourism' and 'higher education', 349 articles have been collected as raw data which were extracted from the Web of Science database. WoS is one of the most famous and credible databases worldwide, including SCIE, SSCI, AHCI, ESCI, and CPCI citation Index. The first paper was published in 1992, which makes a connection between career orientation and industry perception of undergraduate students majoring in Hotel and Tourism Management Programme (Charles, 1992). It reveals an important field in tourism higher education research in which the major, internship experience in tourism industry and employment opportunities perception affect these students' career choice in hotel and tourism management. "Fig. 1" shows that there are four stages in this research field:

The first stage is from 1992 to 2004, including 14 articles exploring some case studies especially in specific areas (e.g., island).

The second stage is from 2005 to 2010, including 65 papers exploring the attitude, perception and management in tourism and hospitality higher education field (e.g. Richardson, 2009).

The third stage is from 2011 to 2016, including 146 published articles concerning the topics of sustainability et.al., 2016), attitude and satisfaction (e.g. Robinson, Ruhanen & Breakey, 2016) in higher education in hospitality and tourism management.

The fourth stage is from 2017 to 2020 with 124 published articles, including the research of main stakeholders' perceptions of core competencies(Kim, Park, & Choi, 2017), the role of internship-related learning outcomes (e.g. Farmaki, 2018) and self-efficiency (e.g. Tsai, C., Hsu, H., & Yang, C., 2017) on hospitality and tourism undergraduates' career decisions and their motivation (Juaneda, Herranz, & Montaño, 2017).
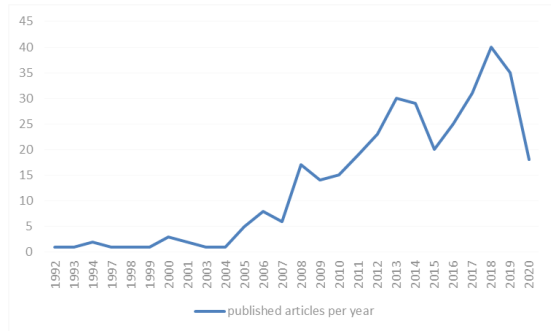

Fig. 1. Published tourism higher education related articles per year.

TABLE I. HIGH FREQUENCY OF KEYWORDS IN HIGHER TOURISM EDUCATION ARTICLES

1994	higher education	32
1999	validity	3
2000	employment	4
2001	hospitality	32
	protected area	5
	ecotourism	5
2004	**tourism**	69
2005	conservation	10
	management	24
	benefit	3
	gender	5
	behavior	14
	attitude	31
2006	framework	3
	education	54
	perception	32
	impact	19
2007	industry	11
	work	8
	student	12
	area	4
	participation	4
	image	3

2008	experience	18
	china	14
	choice	9
	anxiety	3
	health care	3
2009	tourism education	11
	challenge	7
2010	curriculum	3
	college	5
	australia	4
	cointegration	4
	determinant	3
	barrier	4
	economic growth	12
	causality	4
	demand	3
	time series	4
	hypothesis	4
2011	hospitality industry	6
	coral reef	3
2012	**motivation**	14
	decision	3
	career development	3
	model	26
	career	8
	university	15
2013	issue	4
	performance	9
	academic motivation	3
	achievement	4
	learning attitude	3
	business	7
	expectation	7
	internship	7
	climate change	5
2014	sustainability	6
	community	5
	perspective	12
	belief	4
	bounds test	3
2015	environmental education	4
2016	**satisfaction**	17
	program	8
	destination	3
	sustainable tourism	10
	workforce	4
	mobility	4
2017	intention	5
	international student	6
	knowledge	4
	value	4
2018	competence	5
	geoconservation	4
	planned behavior	3
2019	energy consumption	4
	identity	3

B. Data analysis

All the raw data were reserved to a txt file and used the function of data format conversion in CiteSpace to

analysis. In this study, the first step is to present descriptive statistics, as "Fig. 1" and "Table I", to show the overall results. Then the citation analysis method was applied to explore the important author and research in this research area. Lastly, timeline visualization was conducted to explore the evolution of research topics.

IV. RESULTS AND DISCUSSION

A. Research theme

The average frequency of 443 keywords is 2.69, which means the frequency of the keywords which is more than 3 can regard as high-frequency keywords. As "Table I" shows, there are 79 high frequency keywords related to tourism higher education published from 1994 to 2019, with three burst words (tourism, motivation and satisfaction). The effect of higher education in tourism has been explored from attitude, validity, satisfaction, employment, participation, career choice, student engagement, social effects and environmental effects (e.g. Chen & Shen, 2012; Fidgeon, 2010). The relationship between tourism education and the tourism industry is the basic issue and international students are mostly mentioned. Structural equation models, content analysis, in-depth interviews and questionnaire surveys are mainly methods.

B. Scholarly collaboration

Based on co-occurrence analysis, a coauthor network constructed to demonstrate the collaboration relationship in tourism higher education field ("Fig. 2"). There are mainly five clusters of authors, including the team of Salih Katircioğlu (e.g. Katircioğlu, Fethi, & Kilinç, 2010) , the team of Chinning Teng (e.g. Teng, 2008), and the team of Zeki Akinci (Akinci et.al., 2018) (Akinci, Yurcu, & Kasalak, 2018),and the team of Diane Lee (Barkathunnisha, Diane, Price, & Wilson, 2019). Among all of the scholars related to this research area, ChiChing Teng (5 articles) and Jeoushyan Horng (4 articles) published most papers on tourism higher education. Among all the researchers, the geographic and spatial factors affect their collaboration strongly, and China (including Taiwan District, 84 papers), USA (70 papers), Australia (37 papers) published most of the articles, while the collaboration between USA, China, Span, Turkey and England is the most common international collaboration model. Based on the result of burst in CiteSpace, Taiwan in China (from 2011 to 2013 and the strength is 6.62) and Spain (from 2016 to 2020 and the strength is 3.84) contribute to the topics of efficiency of teaching/learning of hospitality skills (e.g., Chen & Shen, 2012 b), and internet techniques in tourism higher education (e.g. Fuenteset.al. 2016; Huang et.al., 2013).
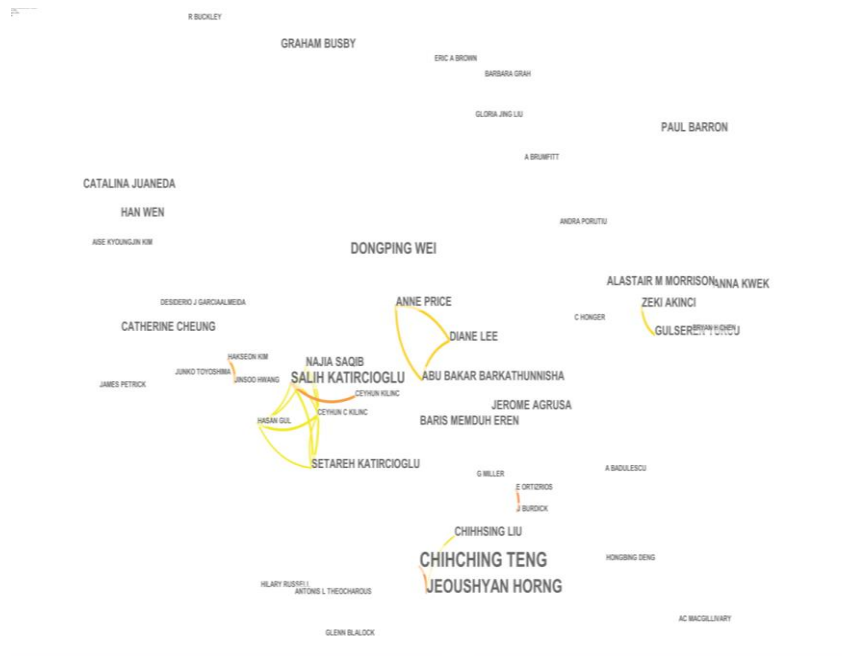

Fig. 2. Visualization of collaboration of scholars in tourism higher education research.

C. Co-citation analysis

Author co-citation analysis (ACA) can explore prominent authors in related research areas especially by graphic display techniques (MacCain, 1990). Based on the result of co-citation analysis from CiteSpace, according to "Fig. 3", the most co-cited article is published in 2008 by Richardson S (Richardson, 2009), which cited frequency is 10, while this author's research in 2009 is also co-cited 9 times, which is ranked second

on all the co-cited authors. Meanwhile, some other authors contribute to this research field: Hair J is co-cited 9 times, Chen TL, Ching L and Fidgeon PR were co-cited 6 times, Zopiatis A, Katircioglu ST and Chang

TY were co-cited 5 times. Among them, only 31 researchers published more than 3 papers, which means this research area needs more research focus.
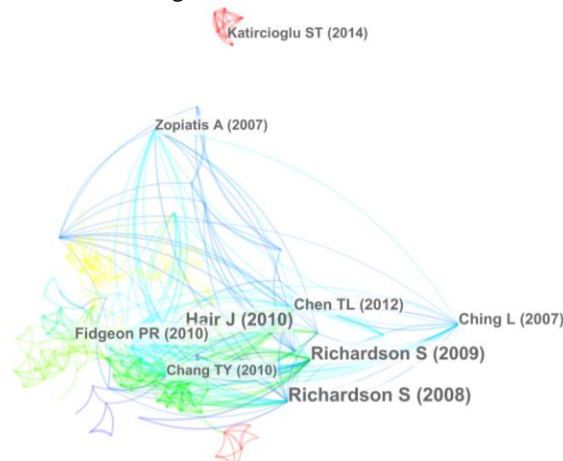

Fig. 3. Visualization of co-citation of published articles in tourism higher education research.

Most cited articles concentrated on two clustered topics: sustainable tourism and hospitality career. In the first cluster, there are 45 keywords (0.5) including their importance which is indicated by LLR algorism by numbers: sustainable tourism (10.56, 0.005); tourism students understanding (10.56, 0.005); graduates satisfaction (7.85, 0.01); hospitality workforce (5.44, 0.05); thematic analysis (5.44, 0.05); hospitality career (5.18, 0.05); four-year hospitality program (5.18, 0.05); chinese students intention (5.18, 0.05); theoretical interest (5.18, 0.05); sustainable development (5.18, 0.05); specific behaviour (5.18, 0.05); a viewpoint (4.73, 0.05); and student (0.5, 0.05). Among them, the effects of teaching technology, internship and industry development has been discussed mostly. China and Vietnam are mostly mentioned.

The second clustered topic including 41 keywords: hospitality (0.5); 1.0 (9.25); four-year hospitality program (9.25, 0.005); Chinese students intention (9.25, 0.005); voice (4.55, 0.05); education (4.55, 0.05); stakeholder (4.55, 0.05); hospitality (4.55, 0.05); mediating role (4.55, 0.05); Vietnam (4.55, 0.05); tourism education (4.55, 0.05); hospitality workforce (1.87, 0.5); thematic analysis (1.87, 0.5); a viewpoint (1.62, 0.5); hospitality student (1.62, 0.5); internship (0.5, 0.5); and internship (0.5, 0.5). Among them is the relationship between students' perception, internship and teaching effect.

D. Timeline analysis

There are nine clustered topics based on terms, according to "Fig. 4", including specializing trade, tourism students' attitude, study motivation, mediating role, hospitality ethics, involving religious leader, economic growth, hospitality education, and hospitality

students' attitude, while the first three topics last the longest duration.

In the first cluster, environmental and economical related behavioral intention and behavior are concerned mostly with the terms: commercial activities, sustainable development, environmental briefing, coral reef, scuba diving, munich streetlife festival, motivating pro-sustainable behavior, student knowledge, environmental literacy, behavioral intention.

In the second cluster with regard to tourism students attitude, the effect of education and sustainable development is mostly considered including top 10 terms: sustainable development goal; tourism student, next generation, education tourism program, gender comparison, sustainable entrepreneurship, learning development, tourism students perspective, difficult moral situation, mediating role.

In the third cluster with regard to study motivation, the curriculum/programs and the students' perception/satisfaction discussed mostly including top 10 terms: student group, study preference, tourism management program, Asian nation, undergraduate tourism management specialty, practice reform, practice strategy, career choice, parental influence, tourism sector.
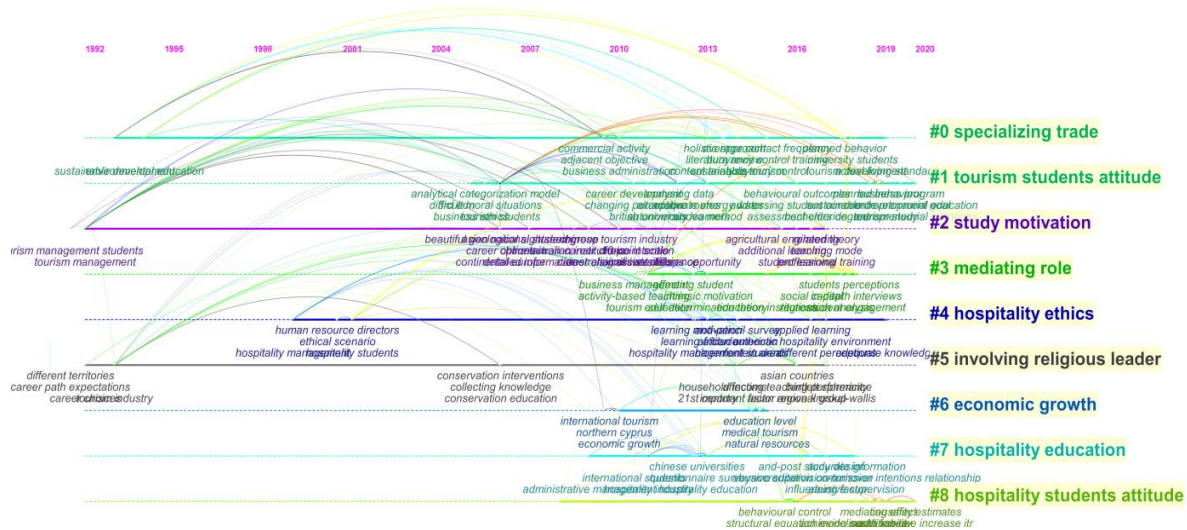
Fig. 4. Timeline view of terms in tourism higher education research.

V. LIMITATION

This current study has some limitations. Firstly, the data source was limited to only the W<unk> database. Future research should include other data sources such as Scopus to gain a better understanding of this research field. Secondly, due to the limitations of the method, other methods may be developed to better explore these research trends.

VI. CONCLUSION

Based on the visualization of CiteSpace, there are three main research topics including four stages especially focusing on trade, students' attitude and study motivation in 349 articles collected from WoS database. The research first concentrated on special regions or areas then transformed to personal perception/attitude/motivation and self identity and learning outcomes. Compared to some other research fields, studies in higher education in tourism still need more exploration since the cooperation network density of authors is low.

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