

Review Paper

Knowledge Graph of University Branding Research: Scientometric Analysis Using CiteSpace

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ABSTRACT

Using CiteSpace, this study visually analyzed literature on university branding found on Web of Science from 2012 to 2022 and explored the development of research in this area. The findings indicated that while university branding research has developed steadily, there remain certain problems, such as imperfect research models, a lack of quantitative research, and a limited research scope. Therefore, to further develop research in this area, it is proposed that university branding research should improve its theoretical innovations, effectively combine brand theory and higher education theory, and improve the operability of university brand theory.

HIGHLIGHTS

- ① This study mainly used CiteSpace, which was developed by Chaomei Chen at Drexel University. CiteSpace is described as “an information visualization software developed using Java language.
- ② It is proposed that university branding research should improve its theoretical innovations, effectively combine brand theory and higher education theory, and improve the operability of university brand theory.

Keywords: University brand, CiteSpace, scientometric, visual analytics

A successful brand is a recognizable product, service, person, or place that adds meaning to itself in such a way that buyers or users perceive relevant, unique, sustainable added value that is likely to satisfy their needs (De Chernatony and McDonald, 1998). A brand plays an important role in shaping an image, guaranteeing credibility, fostering trust, displaying individuality, sharing value, and guiding consumption. Brands have therefore expanded from the narrow commercial sense to include broad social branding, thus forming many brand categories, such as city brands and university brands. University brand building aims to deal with increasing competition among universities under economic globalization, promote university development,

and handle employment volatility in the context of the knowledge explosion and changing social mobility (Maresova, Hruska, and Kuca, 2020). Researchers have studied these various aspects of university branding from different perspectives. The present study aimed to visualize university branding research and identify the hotspots. Based on the findings, this study proposes directions for future research and makes suggestions for the development of university brands.

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LITERATURE REVIEW

Brand definition

There is no consensus on the definition of brand. According to different understandings in the literature, the brand concept can be classified as shown in Table 1.

University Branding

In tandem with trends toward the popularization, marketization, and internationalization of higher education, brand marketing emerged in the field of higher education in the 1980s. In addition, with improvements in social welfare and new forms of public management, the commercialization and marketization of higher education have attracted increasing attention.

Park *et al.* (1986) found that school brand image has not only functional attributes but also emotional and symbolic attributes. On that basis, that study suggested that, to build a brand image, universities should aim to reveal not only the tangible attributes of the brand (e.g., educational functions), but also intangible attributes and benefits (e.g., school reputation). Brand image is therefore not just the sublimation and performance of brand positioning, reflecting the inherent requirements of brand positioning; it is also the personalized performance of brand marketing, which has a significant effect on brand promotion, brand loyalty, and brand equity. Keller (1993) suggested that school brand image comprises various perceptions of the brand, reflected by brand association in the consumer’s memory, and is a subjective understanding, feeling,

and association of the brand among consumers, making it the key object of brand identification. A school’s social status and long-term development have significant effects in this regard.

Sevier (2001) proposed seven steps for creating a university brand. Pulley (2001), meanwhile, considered how to improve university brand association based on commercial market technology, how to attract outstanding students, and how to obtain social funds; that study also discussed misunderstandings in current school naming. Evans (2005) used the tools of enterprise management (e.g., market research, marketing audits, strategic design, innovation, new product development, marketing communication) to explore the formation of school marketing theory. Foley (2006) examined “harmonious” university brand creation from the perspective of balancing stakeholder interests. According to Waraas and Solbakk (2009), university brand building must first define the brand’s “essence.” Essence should express not only the core values and characteristics of the university but also the values of internal and external stakeholders (Chapleo, 2005; Clark, 2009; Jevons, 2006). College branding involves actively constructing visible identities through means such as visual design, vision statements, and the expression of core values (Waraas and Solbakk, 2009).

METHODOLOGY

Research tools

This study mainly used CiteSpace, which was developed by Chaomei Chen at Drexel University.

Table 1: Definitions of brand under different classifications

	Content of the definition	Proposer
Symbol	A brand is a distinguishing mark used to identify different product or service provider	Kotler (1991), Upshaw (1995)
Assets	A Brand is a symbol of its own image, used to accumulate intangible assets	Biel (1992), Kapferer
Complex	Brand is the combination of production, marketing and time and space	Ogilvy (1955), Upshaw (1995)
Relation	Brands are lasting relationships with consumers	Keller (1998), Fleming (2000)
Interaction theory	Through product formation, the production environment, and brand formation and circulation, enterprises shape the character of the brand, and consumers determine the fate of the brand, the brand belongs to the producer, but the real owner is the consumer	Aaker (1991)
Commitment	A brand is a promise, a guarantee and a contract	Panke (2003), Aaker (1991)

CiteSpace is described as “an information visualization software developed using Java language. It can be used to measure the literature collection in a specific field to explore the key path of the evolution of the subject field, and to draw a series of visual maps to form an understanding of the evolution of the subject and the subject.”

Data selection

Articles were retrieved from Web of Science using “subject = ‘university brand.’” Retrieved articles were in English and published between 2012 to 2022. A total of 1021 articles were retrieved, constituting the literature sample for this study. The data were imported into CiteSpace. The inclusion and exclusion criteria were as follows:

- ♦ **Inclusion criteria:** (a) literature related to university branding; (b) published during 2012–2022.
- ♦ **Exclusion criteria:** (a) duplicate publications; (b) documents such as those focused on experience exchange.

RESULTS

Publishing volume

The number of articles published in a certain period of time reflects the development characteristics of the field to a certain extent. A total of 1021 articles were retrieved. Importing them into Excel allowed for easily determining the number of papers published annually. A graph was drawn based on the number of papers published annually to deduce trends in university branding research (Fig. 1). Based on the curve trends in Fig. 1, university branding research can be divided into three stages: slow growth stage (2012–2013), rapid growth stage (2014–2018), and stable growth stage (2019–2022).

In the slow growth stage, the number of papers published each year was 40–60 and was relatively stable. This shows that university branding research had received a certain amount of attention. The number of papers published during the rapid growth stage was 80–100 per year, reflecting progress and rapid development. In the stable growth stage, 110–140 articles were published each year, showing steady growth, indicating that university branding research has received continuous attention while

also showing a trend of fluctuating development.

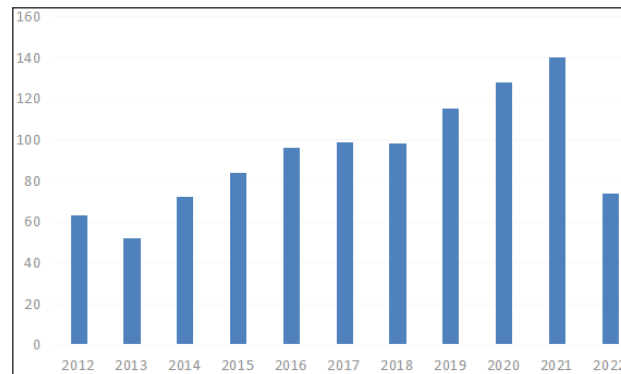


Fig. 1: Annual distribution of literature on university branding (2012–2022)

Author

A visual graph analysis of the 1021 retrieved articles with the node type (Node Type) as the author (Author) was obtained using CiteSpace (Fig. 2). The text in the upper left-hand corner of Fig. 2 shows the relevant data. “N” represents a node—that is, the location node where the author appears. The larger the font size, the higher that author’s frequency in the data. “E” represents a connection; connections between nodes represent cooperative relationships between authors. In Fig. 2, there are 304 nodes and only 87 connections. Intuitively, we can see that there are generally few connections between authors, as well as few connections between prominent authors, indicating a lack of cooperation.

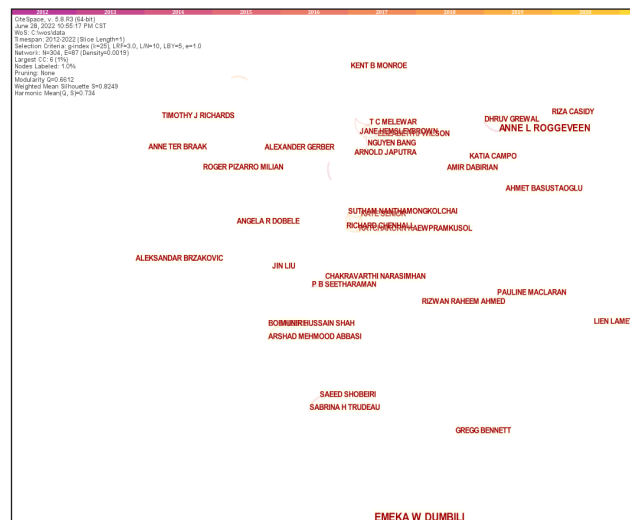


Fig. 2: Author co-occurrence map

Based on the CiteSpace analysis, the top 10 high-yielding authors were identified, as shown in Table 2. Dumbili and Roggeveen published four and three

papers, respectively, while the rest published two papers each. The results in Fig. 2 and Table 2 suggest that university branding research presents a single-core development model. The authors participate extensively but lack the characteristics of continuous in-depth research.

Table 2: Most-published authors in university branding research

Rank	Author	Year of initial publication	Articles
1	Emeka W Dumbili	2016	4
2	Anne L Roggeveen	2014	3
3	Kent B Monroe	2012	2
4	Sutham Nanthamongkolchai	2019	2
5	Kate Senior	2019	2
6	Pauline Maclaran	2018	2
7	Munir Hussain Shah	2020	2
8	Arshad Mehmood Abbasi	2020	2
9	Dhruv Grewal	2014	2
10	Lien Lamey	2021	2

Institutions

Institution was selected as the node type in CiteSpace for visual analysis; Fig. 3 shows the obtained visual map. The larger the font size, the higher the frequency of the institution's appearance in the data. "E" represents a connection; a connection between nodes represents a connection between institutions. As shown in the upper left-hand corner, N = 302 and E = 136; this means cooperation between institutions is not close enough and still needs to be strengthened.

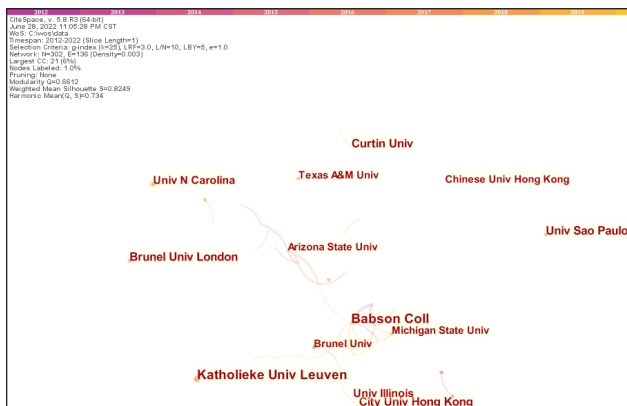


Fig. 3: Co-occurrence map of Institutions

Based on the CiteSpace analysis, Table 3 lists the top 13 institutions in terms of published articles to reflect the relative importance of different institutions in university branding research. Most of the institutions are universities, and Babson College in the United States had the most papers. Babson is a well-regarded business school, known for its focus on entrepreneurship and business management.

Table 3: Institutions with the most published papers in university branding research

Rank	Institution	Year of initial publication	Articles
1	Babson Coll	2013	9
2	Katholieke Univ Leuven	2016	8
3	Brunel Univ London	2014	7
4	Univ Sao Paulo	2015	7
5	Curtin Univ	2014	7
6	City Univ Hong Kong	2013	7
7	Univ Illinois	2012	6
8	Univ N Carolina	2014	6
9	Arizona State Univ	2012	5
10	Texas A&M Univ	2012	5
11	Michigan State Univ	2019	5
12	Brunel Univ	2016	5
13	Chinese Univ Hong Kong	2012	5

Countries

Using CiteSpace, a visual map of research contribution by country was created, as shown in Fig. 4. Node size represents the amount of literature for that country; the more papers, the larger the radius of the node for that country. The color of the outer circle of the node represents the influence of literature from that country. The thicker the line in the outer circle, the stronger the influence. The gradient color in the node represents the age of the literature from that country; warm colors represent recent publications, and cool colors represent earlier ones. A line between nodes means two countries are represented by a single article; thicker lines indicate more collaboration.

Using the data analyzed in CiteSpace, Table 4 lists the top 10 countries with the most articles to reflect the relative importance of different countries in this research area. The US had the most, followed by the UK and China.

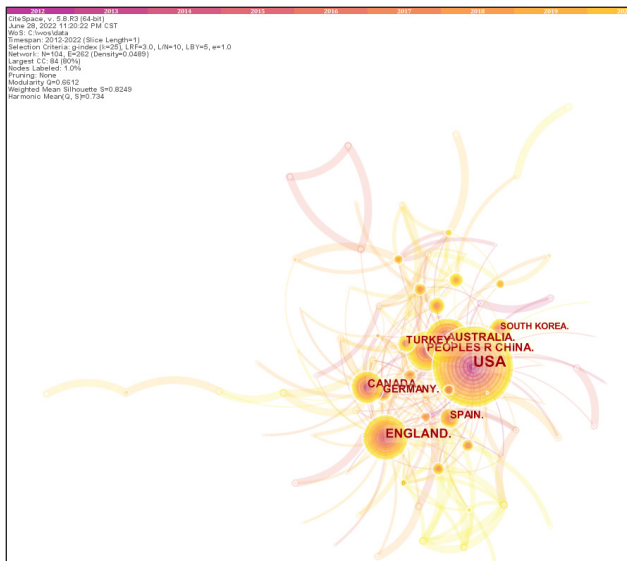


Fig. 4: Country co-occurrence map

Table 4: Countries publishing the most papers in university branding research

Rank	Country	Year of initial publication	Articles
1	US	2012	306
2	England	2012	92
3	China	2012	90
4	Australia	2012	84
5	Canada	2012	63
6	Turkey	2013	39
7	Spain	2012	37
8	Germany	2012	34
9	South Korea	2013	32
10	Pakistan	2012	27

Areas of study

CiteSpace was used to create a keyword co-occurrence map, as shown in Fig. 5. Keywords in large font sizes (e.g., “brand,” “effect,” “model”) are those that appear frequently in the 1021 articles. Keywords with relatively small font sizes include “consumer,” “behavior,” and “strategy,” indicating that researchers pay less attention to those topics.

There are many keywords in Fig. 5. To improve the results, the keyword clustering function in CiteSpace was used to summarize closely related keywords and form clusters (Fig. 6). Based on the network structure and the clarity of clustering, CiteSpace provides two indicators: the module value (Q value; namely, Modularity Q) and the average

silhouette value (S value; namely, Mean Silhouette). When the Q value is > 0.3, the clustering structure is significant; when the S value reaches 0.7, the clustering can be considered convincing.

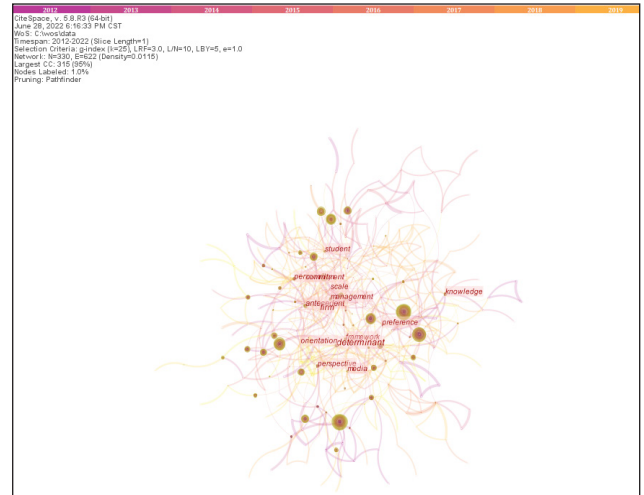


Fig. 5: Keyword co-occurrence map

As shown in the upper left-hand corner of Fig. 6, the Q value is 0.6928 and the S value is 0.8673. Thus, the clustering structure is significant, and the results can be considered convincing.

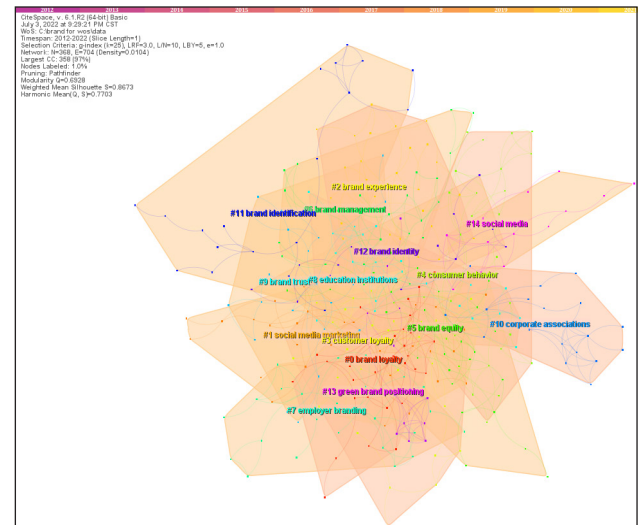


Fig. 6: Keyword cluster map

In Fig. 6, the number of articles in each cluster decreases in order from small to large. Table 5 shows the relevant data for the first 14 clusters. In the table, the “representative keywords in the cluster” are the three most representative keywords in each category. These keywords are helpful for locating the core focus of research on university brands.

Table 5: Keyword clustering

Size	Count	Silhouette	Mean (year)	Representative keywords in the cluste
#0 Brand loyalty	32	0.826	2014	Brand loyalty, social media, brand experience
#1 Social media marketing	30	0.926	2016	Social media marketing, education marketing, online branding
#2 Brand experience	30	0.882	2015	Brand experience, social media, brand loyalty
#3 Customer loyalty	30	0.84	2015	Customer loyalty, customer satisfaction, social media
#4 Consumer behavior	30	0.913	2013	Consumer behavior, choice intention, institutional attributes
#5 Brand equity	28	0.775	2016	Brand equity, brand image, education institution
#6 Brand management	27	0.842	2016	Brand management, public sector, internal brand management
#7 Employer branding	27	0.706	2017	Employer branding, human resource management, personnel management
#8 Education institutions	25	0.876	2015	Education institutions, public heis, autotelic nft
#9 Brand trust	21	0.917	2017	Brand trust, brand loyalty, brand reputation
#10 Corporate associations	19	0.935	2015	Corporate associations, corporate crisis issues, excuse strategy
#11 Brand identification	19	0.958	2016	Brand identification, public sector, brand commitment
#12 Brand identity	14	0.861	2015	Brand identity, brand meaning, internal branding
#13 Green brand positioning	13	0.927	2019	Green brand positioning, green purchase intention, green brand knowledge
#14 Social media	13	0.964	2016	Social media, e-mail avoidance, campus involvement

Based on the keyword results shown in Table 5 and Fig. 6, the perspectives of research on university branding can be divided into three areas:

- (a) The basic category of the university brand (brand equity, employee branding, education institutions, corporate associations, social media);
- (b) Issues in university branding (consumer behavior, brand management, green brand positioning, social media marketing);
- (c) University brand orientation (brand loyalty, brand experience, customer loyalty, brand identification, brand identity).

Research hotspots

The burst point summary function in CiteSpace was used to more accurately discover hotspots in university branding research during the study period (Fig. 7). Based on the historical background and keyword burst map, research hotspots were divided into the stages described below.

From 2012 to 2018, with the slow recovery and growth of the global economy, universities chose relatively stable development models. Therefore,

university branding research during this period was based on brand selection and empirical university branding research.

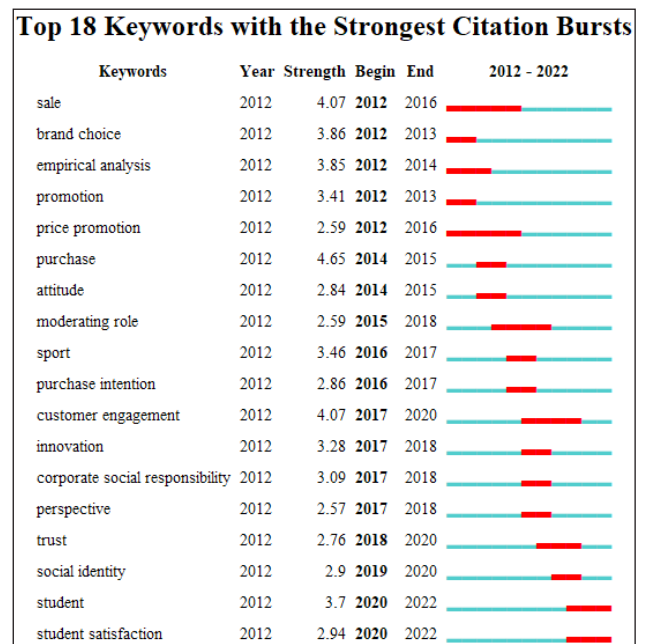


Fig. 7: Burst keyword map

After 2018, with intensified trade frictions between the world’s largest economies, coupled with the

COVID-19 outbreak, the global economy was severely affected by slowdowns in investment, rising consumer prices, and declining business confidence. The higher education market was affected as well. At this stage, university branding research shifted toward a focus on consumers, student satisfaction, brand trust, and the social recognition of brands.

Issues in the research and recommendations

During the study period (2012–2022), theory and practice in higher education marketing were deepened and expanded, and the related concepts and methods were also enhanced. University branding research has made considerable progress, but there are still some problems to be solved.

First, university branding research models are imperfect and unbalanced. The related research since 2012 has investigated university branding from different perspectives, deepening our theoretical and practical understanding. Most researchers have conducted preliminary research, exploring university branding based on their own experience. Therefore, researchers need to strengthen cooperation and develop university brand theories and systems that align with both higher education theories and the higher education market.

Second, university branding research lacks quantitative analysis, showing a preference for qualitative and case-based analyses. Even when quantitative methods are used, the data tend to come from university websites. Few studies obtain data through surveys, and no reliable system for data sources, model selection, and data processing has been established. Therefore, researchers need to optimize their methods and reduce research limitations arising from limited methods.

Third, university branding research tends to be conducted from a macro perspective. Brand theory and higher education theory are still not effectively combined. As a result, while research findings are rich in connotation, constituent elements, and approaches to brand strategy, research on the differences in brand building among different types of universities is insufficient. Therefore, more consideration should be given to higher education theory and the higher education market in university branding research.

CONCLUSION

This study used CiteSpace to explore the development of university branding research and summarize the high-yielding researchers, leading institutions, and research hotspots. In terms of researchers, it was found that there are many researchers in the field, but they are scattered, reflecting a lack of teamwork. Meanwhile, the analysis of research fields and hotspots revealed problems such as imperfect, unbalanced development, and a lack of a unified attitude toward the management and application of research data.

From the perspective of education theory, this study considered the construction of different types of university brands. Researchers and institutions identified as belonging to the core research circle should strengthen cooperation and continue to conduct theoretical explorations to deepen their understanding. They should seek to improve the level of research achievements in the field and more systematically investigate development paths for university branding. In addition, researchers need to seek out new research points, use more varied methods, combine qualitative and quantitative analysis, and strengthen research on weak links. Finally, theory also needs further development in the field of university branding research.

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