The Thinking and Discrimination of Experience Design: A Comparative Analysis of Domestic (China) and Foreign Experience Design Studies Using Bibliometrics from 2002-2022

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Abstract: The emergence of the experience economy created a dissimilation between experience design and user experience design. Experience design was first proposed in 2001 and has been developed for over 20 years; its concept, object, or methods were inseparable from user experience design. This study clarifies the difference in research and the developmental prospect of experience design at home and abroad. For this, 1079 relevant articles published from 2002 to 2022 were collected from the Core Collection Database of Scientific American and the China National Knowledge Infrastructure. This study analyzes knowledge transfer, research hotspots, and evolution using bibliometrics. It also divides the research on experience design into three stages: embryonic (2002-2007), initial (2008-2016), and accelerating (2017-2022). The domestic researchers were more influenced by the rapid development of the Internet and digitalization in China. They also focused more on the practical methods of experience design. The foreign researchers however tended to outgrow user experience design and return to "experience" the scientific research of experience design, further enriching the research level. Thus, domestic researchers should focus more on establishing a Chinese experience design paradigm, differentiating the concept of experience design, and deepening scientific research on it. They should pay attention to the perspective of social innovation and this topic's significance to strengthen the theoretical foundation and develop experience design methods oriented toward multidisciplinary integration.
Keywords: Experience Design; User Experience Design; Knowledge Mapping; Literature Measurement; CiteSpace

1. INTRODUCTION

The concept of user experience design (UX design, UXD, UED, or XD), first proposed by Donald Norman at the Conference on Human Factors in Computing Systems (CHI) conference in 1995, gained widespread popularity since the rapid development of computer technology and the Internet in the 1990s. The wide application of UXD further expanded its connotation and research framework. However, its specific definition and concept remained relatively vague. Norman (Norman, 2016) believed that the original purpose of UXD was to transcend the limitations of the concepts of "human-machine interface" and "usability" and systematically express all dimensions of human experience activities, including industrial design graphics, interactive interfaces, physical interactions, and manuals (PETER, 2007). However, the term "UXD" was used to describe the concept of human experience (ISO, 2018). After realizing the trap of consumerism and materialism in the 1980s and 1990s, Western societies understood the importance of shifting from material to experiential development. The experience society is proposed in the historical view from production society to consumption society, in which the experience design in the field of design is a response to the important social changes that occurred at the turn of the century. The elimination of the term "user" from user experience design signifies the change in design objects and content. However, experience design, like UXD, has problems like unclear concepts and the over-generalization of research objects. Developments over time went beyond the service scope of UXD, raising demands for value shaping, social culture, and national identity. The research results in China are primarily based on the comparison of UXD and experience design problems and disciplinary logic. However, there are few studies on the similarities and differences in domestic and foreign experience design research methods. Additionally, these studies are primarily descriptive, with more subjective reviews. In the past five years, no research has objectively analyzed the topic based on bibliometrics. Using CiteSpace, an influential bibliometric software, this study analyzes the hotspots, concepts, and logical paradigms of experience design research. It maps the development of experience design research at home and abroad and the hidden "experience" clues in different fields comparatively. It objectively presents experience design as a unique form of economic output (Joseph Pine II & H. Gilmore, 2014). This study's findings offer domestic researchers a new way of studying experience design.

2. OVERVIEW OF EXPERIENCE DESIGN

2.1 Definition of Experience

The multiplicity and multilayered nature of the notion of "experience" is the root cause of the ambiguities regarding the concepts of both "user experience design" and "experience design." Historically, China proposed three basic aesthetic experiences to deal with this multiplicity: object feeling, supernatural encounter, and materialization (WU, 2003). In the Western context, experience entails the triple interpretation of undergoing, feeling, and experiencing, wherein there is no clear distinction between the different connotations. Germany began philosophizing the concept of experience in the late 19th century. From the perspective of the individual perception of "true knowledge," experience was interpreted as a concept in the field of humanities, i.e., as the fundamental ability of art and aesthetics. As Gadamer said, something is an "experience" not only if it is experienced, but also if its experiential existence acquires a character that perpetuates its existence (Gadamer et al., 2013). There are still some differences between the Western and Chinese understanding of "experience." Compared to the purely rational depth in Western philosophy, "experience" in the Chinese context is more about the process of emotional occurrence. The present idea of experience is the result of the philosophical reflection after the Western modern empirical turn, in which the body-world connection was constructed. In the Chinese context, experience has a richer connotation, transcending personal feelings, self-explanation of experience, construction of meaning, worldly apprehension, embodied presence, and emotional and imaginative stirring after pure intuition.

2.2 Concept of Experience Design

The social driving force underlying the emergence of experience design is the demand for human well-being in the context of evolving productivity levels, i.e., the emergence of an experience economy that goes beyond the service economy. Pine and Gilmore (Joseph Pine II & H. Gilmore, 2014) first introduced the concept of the experience economy in their 1998 work *Welcome to the Experience Economy* published in the Harvard Business Review. The book *The Experience Economy* published the following year further defined the idea of experience: "Experience is essentially the good feeling that arises in an individual's consciousness when he or she reaches a particular level of emotional, physical, intellectual, or even spiritual well-

being (PINE et al., 1999)," thus unveiling a broader discussion on experience. The transformation from UXD to experience design is not as simple as removing the word "user." It also implies the transformation of the design object from the opposition between human and object (subject-object dichotomy) to the unity of the individual and the world. It is a transformation of the design object: from the dichotomy of subject and object, which is the opposition between human and object, to the unity of individual and world. Therefore, the design object is no longer limited to the physical objects of the present but is expanded to include the existential objects of the past and the future to design relationships from a historical perspective and exhibit the multifaceted characteristics of experience. However, experience design pays more attention to the unity of inner instincts, natural environment, and human society under the guidance of experience philosophy, marking the transition from satisfying external and self-consciousness needs to reflection needs. In this way, the formation of a life expression for the world as a whole leads to a consistent understanding and imaginary community between people and people, people and things, and people and society (JOSEPH & JAMES, 1998). Presently, little research has been conducted on experience design in China. In his keynote speech at the 2014 International Conference on Experience Design, Professor Xin Xiangyang proposed the idea of experience design as a separate design object (Xiangyang, 2019). He believes that experience designers are guided by specific goals, and the meanings generated through different event experiences together constitute the trajectory of personal growth. Thus, compared to UXD, experience design is more concerned with the construction of meaning, especially the meaning of life. Just as Dilthey strongly promoted the meaning of life, the "life" in this case is not a living body in the biological sense, but a rich whole connected with society, history, culture, and the spiritual life of human beings (PENG, 2020). Professor Hu Fei proposed the semiotic approach to product architecture design (SAPAD) model from the perspectives of the "experience of things and objects" and the "meaning of life (HU et al., 2015)." He developed product development and service innovation guided by design knowledge through case studies. Professor Linghao Zhang studied the experience strategy in terms of sensory cognition and collective memory and developed the experience design practice for cultural industry and intelligent products (WEN & ZHANG, 2015). Dr. Fuping Dai and Dr. Yu Wang conducted research on related experience design from the phenomenological and demand perspectives (DAI, 2018). More domestic research on experience design is mostly from the application perspective,

exploring the application paths and methods of experience design in product design, display design, guide design, packaging design, non-genetic heritage, and cultural tourism product design from the derivation of UXD methods.

3. RESEARCH METHODOLOGY

3.1 Data Sources

To explore the domestic and foreign experience design research landscape more comprehensively and ensure research accuracy, three core databases of SCI, SSCI, and A&HCI in the Web of Science and CNKI database were selected in this study; a comparative analysis of domestic and foreign experience design research was thus conducted. For the foreign research literature, the English expression "experience design" was chosen as the main search term in the three aforementioned core databases, considering the polysemy of experience in English. Additionally, the search results of some of the experience design-related search terms were avoided. The following search formula was chosen: AK="experience design" AND DT=(article), where English was the chosen language and 2002-2022 was the period, yielding 1378 articles. After manually excluding the articles related to "experience" and "education," 659 foreign articles were obtained. For the domestic research literature, the Chinese Social Science Citation Index (CSSCI) and Peking University Core Periodical Catalogue in the CNKI database were used as the main data sources. The specific search formula was as follows: SU=experience design NOT SU=education, where Chinese was the chosen language, and the period was 2002-2022, yielding 456 articles. After the manual exclusion of "review," "selection plan," "short newsletters," "conference proceedings," "book reviews," "works," and "preface,", 420 articles were obtained.

3.2 Research Methodology

Over the past two decades in scientific research, bibliometric methods have occupied an important place in intelligence analysis. Scientific knowledge mapping of experience design research mapped on literature co-citations, co-word networks, and author co-citations can exhibit the development and evolution process of scientific knowledge of experience design and explore the structural relationships between them (LI & CHEN, 2022). The application of bibliometric methods allows an objective analysis of the development history, knowledge structure, and development trends

of experience design quantitatively. In this study, CiteSpace 6.1R6 software based on Java language developed by Professor Chaomei Chen was used, which is an important software in scientometrics. This software focuses on showing the strength of relationships among nodes with tree diagrams and connecting lines to discover high-frequency knowledge nodes, clustered knowledge groups, and scholar clusters in the existing scientific literature on experience design as well as other related disciplinary development trends to help researchers understand the relevant research. Knowledge mapping analysis based on CiteSpace for collaborative networks, co-occurrence, and journal bipartite overlay in research on experience design topics can objectively assess the research base, knowledge flow, research hotspots, and development trends of experience design topics.

4. ANALYSIS OF DOMESTIC AND FOREIGN EXPERIENCE DESIGN RESEARCH

4.1 Research Trend Analysis

The number of published articles in a research field reflects its academic trends to some extent. A larger number of publications indicates a higher level of activity in the field. The number of domestic and foreign publications in experience design during 2002-2022 was analyzed based on the data from the WOS and CNKI databases. An analysis of the number and distribution of literature on experience design-related topics each year can form a graph of academic research trends in experience design. The concept of experience economy was first proposed by Pine and Gilmore in 1998, but it did not attract much attention in the field of design. It was not until 2002 that the first article on experience design appeared in China and abroad at the same time. Thereafter, until 2008, the attention on experience design research remained low. There are two main reasons for this:

(1) As a field that shifted from UXD to development, the preliminary foundation of experience design was built on the theoretical framework of UXD. However, most researchers did not distinguish between UXD and experience design.

(2) The first generation of iPhones released by Apple in 2007 gained wide attention, marking a new era of rapid development of mobile Internet and mobile applications. This catalyzed the development of research on experience design. After the enlightenment period from 2002 to 2008, experience design entered an eight-year initial stage. After 2017, the

development speed of domestic and foreign research on experience design began to diverge. The number of publications in domestic literature continued to maintain a linear growth owing to the huge demand for research on UXD in the Chinese Internet industry. In contrast, the number of foreign publications surged and showed exponential growth, leading to the continued focus on experience design due to the deepening of digital transformation in 2016. Customer experience is increasingly becoming the strongest competitive advantage for companies. Internet systems and services must meet customer expectations, replacing price and product as the biggest factors in brand differentiation.

4.2 Knowledge Flow Analysis

Knowledge flow analysis primarily involves studying the relationship between the cited literature, thereby exploring the literature distribution, citation trajectories, and drift of the center of gravity of experience design in different disciplines of research (LI & CHEN, 2022). This study analyzed the knowledge flow using the biplot overlay analysis technique of the CiteSpace software. Based on the literature samples obtained from the WOS search, the Blondel algorithm was used to construct visual journal clusters and then to study the development of research on experience design. The bottom part of the biplot overlay contains a clustered distribution of more than 10,000 scientific journals worldwide according to different subject areas and citations. The analysis graph is divided into a left part and a right part, where the left part of the graph shows the distribution of the main disciplines of the cited literature, representing the current state of research on experience design. The right part represents the subject areas of the cited literature, which form the basis of experience design research. For the preliminary analysis structure, the knowledge flow trajectories were clustered using the Z-Score algorithm within the software, and two core knowledge flow trajectories were obtained. Research on experience design was primarily developed from #7 psychology, education, and society to #1 mathematics, systems, and mathematical models and #6 psychology, education, and health. Currently, psychology, education, and health research fields are relatively more complex and intensive, serving as the focus and hotspot of experience design research. The comprehensive analysis revealed the expansion of research fields related to experience design. In addition to psychology, mathematics, education, and society, experience design has been expanding into engineering and management-related fields, such as economics, policy, materials, ecology, and medicine, further reflecting the interdisciplinarity and diversity of experience design.

4.3 Core Author Analysis

The analysis of the authors of existing literature on experience design yielded a collaborative network map of authors. This network map not only revealed the authors with a high number of publications but also enabled the study of the collaborative connections between different authors in the field. CiteSpace was used to process the data of the selected domestic and foreign literature samples by choosing the "authors" node, followed by data organization and statistics using the Excel software (Table 1).

Table 1: Statistics of high-publication Authors in the Foreign Literature Samples (Top 10)

Number 0f Publications/ N	**Year**	**Author**	**Number of Publications/N**	**Year**	**Author**
6	2013	Heylighen, Ann	5	2006	Mccarthy, John
5	2016	Tonetto, Leandro Miletto	5	2009	Patricio, Lia
5	2010	Loke, Lian	5	2015	Spence, Charles
5	2011	Zhou, Feng	4	2013	Spence, Jocelyn
5	2009	Fisk, Raymond P	4	2013	Desmet, Pieter M A

As evident, Ann Heylighen was the most prolific foreign author with six articles. She primarily dealt with sensory experience-based approaches to the design of architectural spaces, such as museums, houses, and hospitals. Heylighen also conducted embodied experience studies based on disadvantaged groups, such as patients, the disabled, and the elderly, and proposed the value of experience design. However, she was not the first author in all six papers; she was involved in cross-sectional research in the field of architecture as an experience design researcher. Other authors with more publications, such as Raymond P Fisk and Lia Patricio constituted a collaborative team of experience design interdisciplinary research (Fisk et al., 2020; PATRICIO et al., 2011); they proposed multilevel customer experience models, such as MSD and MINDS from a management perspective. Additionally, Leandro Miletto Tonetto proposed a quantitative research methodology oriented to physical products like the automotive experience (TONETTO & DESMET, 2016). The core authors are the backbone of the development of related research topics and influence the

development of research trends. According to the definition and calculation formula of Price's law for the core author group (de Solla Price, 1963): M=0.749×(Nmax)1/2 (Nmax: the number of publications of the most prolific author), the value of M for the number of publications of the high prolific author was calculated as 1.835. Therefore, authors with more than two publications can be considered as core authors. According to the statistical analysis, the number of publications by the high-publication authors was 360 (about 54.5%). Therefore, although the number of foreign publications on experience design was small and the collaboration was weak, a core group of authors was initially formed (Table 2).

Table 2: High-Publication Authors in the Domestic Literature Samples (Top 10)

Number of Publications/N	Year	Author	Number of Publications/N	Year	Author
14	2011	Zhang Linghao	5	2010	Li Shiguo
9	2016	Xu Yanzhang	5	2011	Zhao Yuxiang
7	2019	Wu Chunmao	5	2015	He Renke
6	2015	Xin Xiangyang	4	2016	Xia Jinjun
5	2018	Hu Fei	4	2017	Jiang Xiao

As evident, Zhang Linghao had the largest number of publications in domestic literature with a total of 14 publications in 11 years from 2011 to 2022. His works involved experience design research from empathic design (WEN & ZHANG, 2015) to product symbolic perception translation (ZHANG et al., 2018). Finally, he formed a systematic experience design thinking paradigm that he (Zhang et al., 2021) innovatively applied to experience design research targeting national product culture and collective memory (ZHAO & ZHANG, 2022). Authors with more than five publications also include Xu Yanzhang, Wu Chunmao, Xin Xiangyang, and Hu Fei. According to the calculation of Price's law, the M-value of the number of articles issued by the highly productive authors of the domestic core author group was 2.8. Therefore, authors with more than three articles can be considered the core authors of domestic research on experience design. The total number of articles issued was 204, accounting for 48.6% of the sample size of domestic literature. The number of individual publications by domestic authors on experience design research was more than that of foreign authors. However, the collaborative network was more fragmented and devoid of a core author group. A comparative analysis of author collaboration network mapping based on CiteSpace yielded the

following results:

(1) Although the overall number of articles published in China was lower than that published abroad, the number of articles published by domestic prolific scholars was much higher than that of international prolific scholars.

(2) A core group of authors formed in foreign research on the experience design. However, similar to the cooperation of authors in domestic experience design research, most domestic articles were authored by one scholar or co-authored by two scholars. Thus, the overall cooperation was not strong except for the team of Zhang Linghao of Jiangnan University.

4.4 Institutional Cooperation Analysis

Table 3(a): Comparison of Publications from Chinese and Foreign Research Institutions in the Domestic Literature Samples (Top 10)

Cooperation of Foreign Research Institutions				**Cooperation of Domestic Research Institutions**		
Number of Publications/ N	Percentage	Institution	Country	Number of Publications /N	Percentage	Institution
23	3.48%	Delft University of Technology	Netherlands	39	9.29%	Jiangnan University
12	1.82%	Eindhoven University of Technology	Netherlands	17	4.05%	Academy of Arts & Design, Tsinghua University
9	1.36%	Georgia Institute of Technology	USA	12	2.86%	Hunan University
8	1.21%	Hong Kong Polytechnic University	China	7	1.67%	Tianjin Normal University
8	1.21%	University of Cambridge	UK	7	1.67%	Jiangsu University
7	1.06%	Korea Advanced Institute of Science and Technology	South Korea	7	1.67%	Donghua University
7	1.06%	University of Sydney	Australia	5	1.19%	Nanchang University

Table 3(b): Comparison of Publications from Chinese and Foreign Research Institutions in the Domestic Literature Samples (Top 10)

Cooperation of Foreign Research Institutions				**Cooperation of Domestic Research Institutions**		
7	1.06%	Polytechnic University of Milan	Italy	4	0.95%	Guangzhou Academy of Fine Arts
7	1.06%	Cornell University	USA	4	0.95%	Nanjing University of Science and Technology
6	0.91%	University of Nottingham	UK	4	0.95%	Tianjin University of Technology

As evident from Table 3, the international research institutions researching experience design were primarily located in developed countries, especially in the Netherlands (the Delft University of Technology and Eindhoven University of Technology) because of their deep foundation in the discipline of interaction design. These institutions continue to be the pioneers and leaders in international research on experience design, focusing more on experience design and quantitative evaluation methods. However, research institutions in other countries focused more on experience research related to human interaction, such as product experience, emotional experience, museum experience, and customer experience. In China, Jiangnan University, with 39 publications accounting for more than 9% of the overall literature, made the largest contribution to the research on experience design. Among them, Zhang Linghao and Xin Xiangyang's team was the most prominent, primarily focusing on experience design strategies and concepts (Xiangyang, 2019; ZHANG et al., 2018). The other institutions with a large number of articles were the Academy of Arts and Design of Tsinghua University and Hunan University; both contributed more than 10 articles. The comparative analysis of the domestic and foreign sample data revealed the following findings:

(1) Both internationally and domestically, the main strength of research institutions on experience design was distributed across universities and concentrated in economically developed countries or coastal regions. This trend was positively correlated with the degree of economic development to a certain extent. The faster the economic development, the greater the

demand for research on experience innovation mechanisms in the experience economy, which also offered more diverse practice fields.

(2) The cooperation among institutions was relatively weak, and scientific research cooperation must be further strengthened.

(3) Most of the international research institutions that researched experience design were located in science and technology and comprehensive colleges. Additionally, the research content was primarily quantitative scientific analysis. However, domestic institutions primarily included polytechnics and art colleges, and the research content was divided into quantitative scientific research and qualitative research on experience design. This pattern was inextricably linked to the concept of cross-development between design and other disciplines as well as the strong demand for UXD research encouraged by the rapid development of the Internet industry.

5. DOMESTIC AND FOREIGN EXPERIENCE DESIGN KNOWLEDGE MAPPING ANALYSIS

5.1 Differences in the Hotspots of Experience Design Between Domestic and Foreign Research

Research hotspots indicate the subject matter that is of general interest to researchers in a particular field. Keywords are the authors' highly condensed and summarized descriptions of specific literature. Therefore, the examination of keywords can quickly reflect the core content and focus of the literature. CiteSpace-based co-occurrence analysis was conducted in this study to map the knowledge of keywords in the sample data of domestic and foreign literature. Subsequently, the research hotspots and related knowledge bases of experience design at home and abroad were discussed.

Finally, a comparative analysis was conducted. In CiteSpace, the node type was set as keywords, the time range was between 2002-2022, the time frame was set as 1 year, and the node threshold screening TOP N was set as 50. The network cropping was performed using Pathfinder, pruning sliced networks, and pruning the merged network. Subsequently, the sample data of domestic and foreign literature were analyzed separately. Finally, the synonymous keywords were merged and processed, yielding the list of keyword frequency and betweenness centrality of keywords and the keyword co-occurrence map of domestic and foreign experience design theme research.

Table 4: Word Frequency Distribution of Keywords in the Foreign Literature Samples

Frequency Number	Betweenness Centrality	Year of the First Occurrence	Keywords	Frequency Number	Betweenness Centrality	Year of the First Occurrence	Keywords
178	0.36	2004	User Experience	25	0.05	2012	Behavior
74	0.15	2004	Design	23	0.06	2017	Tourism
70	0.16	2003	Experience Design	22	0.05	2013	Emotion
47	0.04	2011	Service Design	22	0.06	2004	Interaction Design
41	0.04	2012	Perception	20	0.04	2014	Quality
40	0.08	2015	Impact	19	0.07	2014	Technology
39	0.02	2012	Customer Experience	17	0.02	2016	Management
39	0.12	2008	Model	17	0.01	2012	Patient Experience
36	0.11	2005	Product Design	17	0.04	2010	Consumption
35	0.05	2007	Experience	15	0.03	2012	User-Centered Design
35	0.05	2011	Satisfaction	14	0.04	2016	Performance
32	0.07	2012	Usability	14	0.04	2017	Health
30	0.06	2011	System	14	0.08	2011	Environment
28	0.04	2014	Framework	13	0.05	2012	Co-Creation
26	0.04	2016	Innovation	12	0.08	2011	Consumer

Table 5(a): Word Frequency Distribution of Keywords in the Domestic Literature Samples

Frequency Number	Betweenness Centrality	Year Of The First Occurrence	Keywords	Frequency Number	Betweenness Centrality	Year of the First Occurrence	Keywords
157	0.84	2002	Experience Design	5	0.01	2010	Human-Computer Interaction
85	0.36	2006	User Experience	5	0.03	2009	Design Method
27	0.1	2006	Product Design	5	0.01	2019	Artificial Intelligence
22	0.11	2011	Interactive Design	5	0	2011	Children
17	0.1	2006	Experience	5	0.02	2006	Interaction
13	0.06	2004	Experience Economy	4	0	2013	Big Data

Table 5(b): Word Frequency Distribution of Keywords in the Domestic Literature Samples

Frequency Number	Betweenness Centrality	Year of the First Occurrence	Keywords	Frequency Number	Betweenness Centrality	Year of the First Occurrence	Keywords
13	0.03	2012	Service Design	4	0	2004	Innovation
11	0.04	2002	Industrial Design	4	0	2020	Positive Experience
11	0.06	2005	Tourism Experience	4	0.02	2010	Brand
10	0.06	2011	Emotional Experience	4	0.02	2010	Book Design
10	0.09	2013	Museum	4	0.01	2010	Usability
9	0.04	2007	Design	4	0.01	2017	Children's Cognition
8	0.04	2004	Packaging Design	3	0	2006	Experience Marketing
7	0.02	2021	Design Strategy	3	0.01	2015	Augmented Reality
6	0.02	2020	User Needs	3	0.01	2019	New Retail

In keyword co-occurrence mapping, the node size reflects the scale degree of the number of keyword occurrences, with a larger area representing higher frequency and vice versa. The line between the nodes represents the number of occurrences of different keywords in the same literature, where the color of the line represents the time of first occurrence, with warmer color representing later occurrences. The research mapping of experience design in foreign countries contained 513 nodes and 1003 links, and the network density was 0.0076. The research mapping of experience design in China contained 421 nodes and 640 links, and the network density was 0.0072. Based on the same statistical criteria, the research on experience design at home and abroad started at nearly the same time, but there were some differences in research development. Specifically, there was a gap between the number of keywords (18%) and the number of links (36%) included in the co-occurrence analysis. Thus, foreign studies showed a higher number and concentration ratio of keywords and a stronger keyword linkage. According to the high-frequency keyword ranking in Tables 4 and 5, the research hotspots in terms of experience design topics in China and abroad showed similarity and heterogeneity as well as presented the characteristics of homogeneous sources and different streams. Overall, foreign research on experience

design was more diverse, extensive, and unbiased. However, domestic research was relatively "biased," and the research perspectives were influenced by user experience and interaction design, which have not yet formed a large-scale development momentum. Higher betweenness centrality in keyword co-occurrence mapping represents a more important role of commitment between different node flows. Therefore, betweenness centrality can be used to measure the importance of nodes in the current network structure and thus identify the key research content (Lyu et al., 2019). To better explore the differences in research hotspots on experience design at home and abroad, the keywords with high betweenness centrality and word frequency were selected for comparative analysis in terms of both similarity and heterogeneity. Table 6 shows the top 10 selected keywords.

Table 6: Important Co-Occurrence Keywords in the Domestic and Foreign Literature Samples

Important Co-Occurrence Keywords in the Domestic and Foreign Literature Samples (Ranked by Word Frequency and Betweenness Centrality)				**Important Co-Occurrence Keywords in the Domestic and Foreign Literature Samples (Ranked by Word Frequency and Betweenness Centrality)**			
Frequency Number	Betweenness Centrality	Year Of The First Occurrence	Keywords	Frequency Number	Betweenness Centrality	Year Of The First Occurrence	Keywords
178	0.36	2004	User Experience	157	0.84	2002	Experience Design
74	0.15	2004	Design	85	0.36	2006	User Experience
70	0.16	2003	Experience Design	27	0.1	2006	Product Design
47	0.04	2011	Service Design	22	0.11	2011	Interactive Design
41	0.04	2012	Perception	17	0.1	2006	Experience
40	0.08	2015	impact	13	0.06	2004	experience economy
39	0.12	2008	Model	13	0.03	2012	Service Design
39	0.02	2012	Customer Experience	11	0.06	2005	Tourism Experience
36	0.11	2005	Product Design	11	0.04	2002	Industrial Design
35	0.05	2007	Experience	10	0.09	2013	Museum

According to the social network analysis method (Liu, 2004), betweenness centrality greater than 0.1 indicates that the node belongs to an important position in the overall knowledge graph and is an important

research content. The co-occurring keywords with mediated centrality greater than 0.1 in the domestic and foreign literature samples were experience design, user experience, product design, interaction design, experience and user experience, design, experience design, model, product design, and acceptance (Table 6). The following were the similarities between domestic and foreign experience: (1) The number of co-occurring keywords with betweenness centrality was relatively small, and the trend of diversified research hotspots remains unformed. (2) The co-occurring keywords with betweenness centrality were user experience, experience design, service design, and product design. Therefore, scholars at home and abroad in the process of research on the theme of experience design have investigated the theoretical relationships (HU & JIANG, 2018; Tuch et al., 2012), definitions (DAI, 2018; Wright et al., 2008), elements (CAO, 2006; Hummels et al., 2007), and application paths (Ahmed et al., 2003; Tussyadiah, 2014) of user experience, experience design, service design, and product design. They also tried to shift the thinking and methods of experience design, which was primarily focused on interface interaction, to the topics of real social and physical products as the object of study and meaningful innovation through experience, seeking new dimensions of applying experience design innovation in different fields. The differences between domestic and foreign research on the theme of experience design were as follows: (1) There were differences in the disciplinary background of the research content. Foreign research more often placed experience design in the context of different disciplines, such as management, tourism, medicine, nursing, aesthetics, and architecture, for cross-research. However, domestic scholars focused more on mobile Internet interaction, tourism, cultural creativity, and other more specialized fields, and the interdisciplinarity of disciplines was weak. (2) There were differences in the research process. Foreign research shifted from the initial focus on user experience and interaction design to emotional cognition, ethics and morality, aesthetic meaning, cultural tourism, customer experience management, and other related topics. However, domestic research remained limited to the study of different emotional experiences and cultural heritage under mobile interaction. (3) There were differences in the research perspectives and purposes. Foreign scholars mostly focused on research from phenomena to laws, conducted quantitative research on experience design through design practice cases as samples, formed experience design strategies, methods, and models; proposed more experience design research methods and paradigms, and involved various research levels. However, the domestic research was biased to the practical and partial quantitative research on UXD and cognitive methods in the

context of the Internet industry and the rapid integration of information technology (IT) with industrialization. Therefore, the research at the theoretical level was lesser and primarily at the stage of concept identification and development overview. (4) There were differences in research concentration. According to the analysis of the frequency of keywords, there was a two to three-times difference in the attention of domestic and foreign researchers to keywords except for "experience design" and "user experience." This indicates that the foreign researchers reached a higher degree of consensus on the research issues of experience design. However, the domestic researchers remained at the stage of defining experience design research issues; they have been trying to clarify the core issues of experience design topics in the domestic environment through a large number of studies.

5.2 Differences in Domestic and Foreign Experience Design Theme Clustering

To better explore the distribution pattern of domestic and foreign experience design topic research hotspots and deeply reveal the inner co-occurrence relationship, further clustering research was conducted based on keyword co-occurrence mapping. The noun terms were extracted from the keywords by log-likelihood algorithm (LLR) (Dunning, 1994) and then clustered (Figures 1 and 2), where #n represents the cluster number. Higher cluster ranking indicates a larger cluster size and importance. After clustering, the keyword co-occurrence clustering module Q values of the domestic and foreign literature samples were 0.8037 and 0.7029, both >0.3, respectively, with significant clustering structure (LI & CHEN, 2022). The mean profile S-value decibels for clustering were 0.9171 and 0.9369 (both >0.7), indicating robust clustering results (LI & CHEN, 2022).

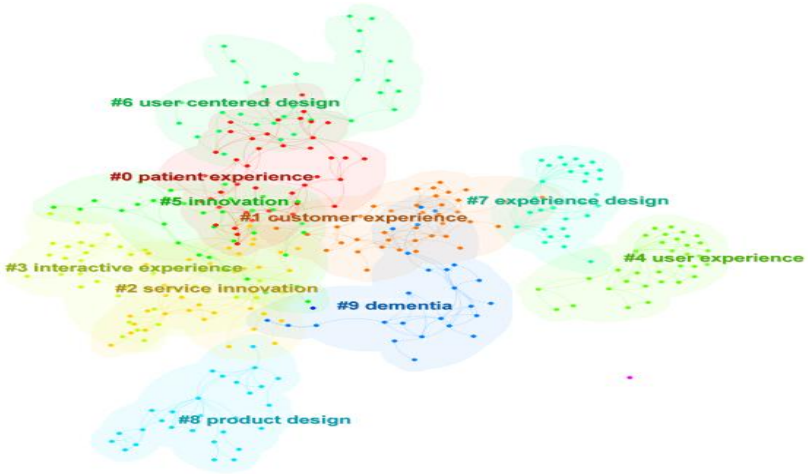

Figure 1: Cluster Analysis of Keyword Co-Occurrence in the Foreign Literature Samples

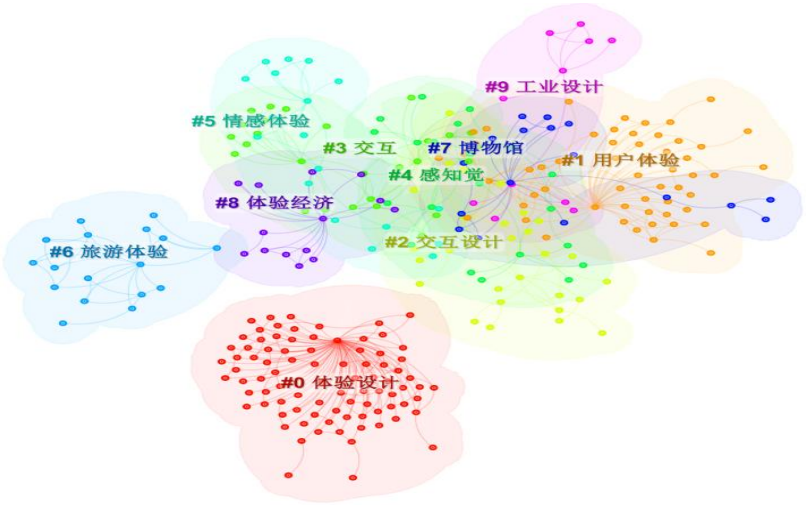

Figure 2: Cluster Analysis of Keyword Co-Occurrence in the Domestic Literature Samples

The clustering results of Figures 1 and 2 were integrated to form the experience design theme clusters and research focus analysis (Tables 7 and 8).

Table 7: Clustering of Keyword Co-Occurrence in the Foreign Literature Samples

Cluster No.	Cluster Name	Keywords Within the Cluster	Research Focus
2	Service Innovation	Service Innovation; Value Creation; Service Design; Service Experience; Appraisal Theory	Experience Design Complexity
7	Experience Design	Experience Design; Social Media; Web Design; Corporate Image; Boutique Hotels	
1	Customer Experience	Customer Experience; User Experience; Customer Loyalty; Service Design	Experience Management
9	Dementia	Dementia; Consumer Response; Interaction; Participatory Design; Youth	
3	Interactive Experience	Interactive Experience; Ergonomic Design; Art Design; Human Factors; Experience-Centered Design	Experience Design Approach
4	User Experience	User Experience; Customer Experience; Usability; Design Tool; User Opinions	
5	Innovation	Innovation; Mobile Phone; Experimental Design; Human-Centered Design; User-Centered Design	
6	User-Centered Design	User-Centered Design; User Study; Virtual Reality; Human-Computer Interaction; Ambient Displays	
0	Patient Experience	Patient Experience; User Experience; Pediatrics; Healthcare; Grounded Theory	Experience Object Research
8	Product Design	Product Design; Choreography of Interaction; Design Education; Design Research; Data Mining	

Table 8: Clustering of Keyword Co-Occurrence in the Domestic Literature Samples

Cluster No.	Cluster Name	Keywords Within the Cluster	Research Focus
0	Experience Design	Experience Design; User Experience; Product Design; Interactive Design; Design	Experience Design
1	User Experience	User Experience; Product Design; Usability; Experience Design; Interface Design	Content And
2	Interactive Design	Interactive Design; Service Design; Children's Cognition; Mobile Reading App; Smart Media Era	Methods
3	Interaction	Interaction; Book Design; Children; Experience; Mental Models	
9	Industrial Design	Industrial Design; Design Methodology; Optimization Design; Six-Dynasty Ancient Capital; Smart Pill Box	
4	Sensory Perception	Sensory Perception; Development; Design; Zhangjiajie; Children's Toys	Experience Elements
5	Emotional Experience	Emotional Experience; Design Strategy; Experience Design; Huishan Clay Sculpture; Sensory Experience	
6	Tourism Experience	Tourism Experience; Tourism Destination; Tourism Motivation; Operation; Level of Experience	Experience Object Research
7	Museum	Museum; Exhibition Experience; Royal Kiln Gold Bricks; Intelligent; Digital Media	
8	Experience Economy	Experience Economy; Branded Apparel; Brand Elements And Segments; Customer and Brand Integration; Life Consultant	

The comparative analysis of keyword co-occurrence clustering mapping of domestic and foreign research on experience design revealed similar keyword clusters, including experience design, user experience, and industrial design. However, a more heterogeneous keyword clustering was observed. Therefore, the differences and research trends of keyword clustering were analyzed in depth from the perspectives of domestic and foreign research. Foreign research on experience design could be divided into four main categories: experience design complexity, experience management, experience design methods, and experience object research. Experience design complexity primarily included two clusters #2 service innovation and #7 experience design, and the keywords included "service innovation," "value creation," and "experience design,". RN Bolton (Bolton et al., 2018), K Varnali (Varnali, 2019), D Plotkina (Plotkina et al., 2022), and F Grandi (Grandi et al., 2022) proposed a framework for the study of experience design as a complex system from the perspectives of

cross-discipline, customer experience, and complex processes, focusing on the analysis of experience design principles and complex elements in the experience process as well as practical implications (Varnali, 2019). Other scholars addressed design thinking (Boydell et al., 2021; Stigliani & Ravasi, 2018) and experience processes (Li & Hölttä-Otto, 2020; Mishra et al., 2015; Shin, 2017) in the context of cross-cultural, media pluralism, and spatial parallelism (Han et al., 2022) after the object of experience design research has shifted to physical objects, dedicated to enhancing human group experience (Fisk et al., 2020). Experience design management involved high-frequency keywords, such as "customer experience" and "user experience" in clusters #1 and #9. In the context of the experience economy, an interdisciplinary perspective (Chevtchouk et al., 2021) is used to consider experience design as an important innovative approach in the customer management process. Determining customers' personalized needs and behavioral intentions and exploring experience involves dynamics mechanisms (Camargo & Henson, 2015) and design approaches that intervene during different customer journeys, primarily involving the study of enhancing customer loyalty (Siebert et al., 2020), improving service quality (Beltagui & Candi, 2018; Das Gupta et al., 2016), and analyzing experience frameworks (Petermans et al., 2013) in retail environments through customer journeys (Ponsignon, 2023) and customer experience modeling (Teixeira et al., 2012). Other scholars have further explored non-contact customer experience pathways in the context of the COVID-19 pandemic (Hao & Chon, 2021). Among the topics on tourism, according to many researchers like S Jiang (Jiang et al., 2023), W Wang (Wang et al., 2022), J Stienmetz (Stienmetz et al., 2021), and Tussyadiah (Tussyadiah, 2014), intellectual property (IP) is significant in the context of the smart age and globalization (Soulard et al., 2019). Through augmented reality (AR) technology (Jiang et al., 2023), spatial analysis (text analysis, deep learning, and econometric joint analysis) (Zhang et al., 2020), and image analysis (Lalicic et al., 2021), complex content experience design research of tourism destinations, tourism products, tourism cuisine (Forlani et al., 2022), and holiday tourism (Neuhofer et al., 2020) can be conducted based on the knowledge of cognitive psychology (Skavronskaya et al., 2017), behavioral economics, and management (Xiang et al., 2021) to strengthen the experiential meaning and effect of cultural heritage tourism products and highlight the perceived value of tourism experience (Breiby et al., 2020). Additionally, the tourism experience is the key to enhancing tourism destination management (Moscardo, 2020; Stienmetz et al., 2021). An attempt was made to establish three principles (Tussyadiah, 2014) and four

experience design methods (Tussyadiah, 2014) for experience design at different stages (Ponsignon et al., 2017) of the journey. Other scholars developed conceptual models of innovative tourism products (Custódio Santos et al., 2020) with intelligent interaction approaches (Bødker & Browning, 2012). Four design elements for customer experience in the cultural domain were proposed (Ponsignon et al., 2017). Based on descriptive studies and applied development studies of complex systems of experience design, scholars paid more attention to the importance of experience process meaning construction (Artusi & Bellini, 2020) and value creation (Andreassen et al., 2016; Cong et al., 2020; Sudbury-Riley et al., 2020; Trischler et al., 2018; Uysal et al., 2020), describing the doctrinal basis of experience design as an important driver of future social innovation. The experience design approach contained clusters #3, #4, #5, and #6, which reflected experience design methods and evaluation mechanisms, such as UXD, innovation, human factors, and human-centeredness. User experience had a significant impact on the effective design and improvement of products, especially for personalized products that met users' individual needs (Song et al., 2018). Designing some experience aspects with unexpected characteristics will have a better promotional effect on the initial introduction of a product or service meant for consumers (Lee et al., 2021). Emotions, spatial orientation (Plotkina et al., 2022), visual appearance (Marques da Rosa et al., 2019), aesthetics, and other joint perceptions (Mesimäki et al., 2019) should be considered when evaluating the effectiveness of experience design. Some architecture researchers explored the extent to which spatial features affect the overall experience of space (Ergan et al., 2018). The study of experience objects primarily contained #0 patience experience and #7 product design. The analysis of the included keywords showed that in the context of the experience economy, the production and manufacturing methods of products have changed, and the traditional strategic planning of products can no longer meet the market demand (Kim et al., 2018), leading to a shift from traditional mass manufacturing to mass customization production. Therefore, the application of collaborative innovation design methods in the product design process should be emphasized to enhance the value of the product experience (Turner et al., 2020). M Gon focused on the real-life localized experience in which the product design itself is located, and it is a complex and subjective concept (Gon, 2021). In this field, Internet vehicles like social media directly influence the consumer's consumption process, moving from simple product consumption to a social experience process based on the product itself linking the real and digital worlds.

Furthermore, foreign researchers also focused on the doctor-patient experience in the process of medical rehabilitation and treatment (Morris et al., 2021). Domestic experience design research could be primarily divided into three categories: experience design content and method, experience elements, and experience object research. The first category is related to experience design content and method, including #0, #1, #2, #3, and #9; the keywords were "user experience," "experience design," "product design," "children," and "industrial design." Xin Xiangyang proposed the academic view of "experience design as a design object" (Xiangyang, 2019) and moved beyond "an experience" (HU & JIANG, 2018) to the paradigm shift from "user experience to experience design" (Xiangyang, 2019). Given the fundamental role of UXD for experience design, although the domestic researchers shifted their research horizons to the field of industrial design with solid objects as the main focus, they primarily focused on reviewing and exploring the methods of UXD in this kind of research. For example, researchers Luo Shijian and Hu Fei discussed the interaction between user experience and the human-product-environment dynamic (HU et al., 2015; LUO et al., 2010). They identified the common concepts of user experience and usability and sorted out the UXD methods in three dimensions, namely method attributes, design process, and research objects (Hu et al., 2020). They also proposed a context-based human-computer system model for UXD (LUO et al., 2010). These results offer a solid theoretical foundation for developing experience design methods. Other researchers further deepened design method research for specific scenarios based on the aforementioned theories, such as exploring the design methods for consumer online shopping experience (JIANG et al., 2018), life experience enhancement for the elderly population (ZHAO et al., 2019), and intangible cultural heritage experience and revitalization (CHEN & ZHANG, 2021) based on mind flow theory, innovative immersive technology, and intangible cultural heritage-related traditional skills. Further, methods to improve product quality and competitiveness through experience design have become a topic of interest for relevant researchers. Chen Wei proposed six elements of product experience design (CHEN, 2011) and constructed a product design method that focuses on shaping sensory experience (ZENG et al., 2020) and psychological identity (CHEN, 2011). He also discussed the product experience practice methods for the elderly (LI & ZHANG, 2015) and children (WANG et al., 2017). The second category involved experience elements, which are the main research questions of the two clusters #4 and #5. According to the literature analysis, researchers on the

topic of experience design in China encountered the homogeneous competition of mobile Internet. Jihong Zhu et al. proposed to explore emotional processes based on Norman's emotional design hierarchy and Gagne's information processing learning theory; they proposed a three-level model of emotional experience design (Ji-hong et al., 2018) and index (LIN & JIANG, 2011). Subsequently, quantitative analysis methods, metacognitive methods, and PAD methods were applied to study the experience requirements (WU et al., 2022) and user experience satisfaction. The positive and virtual affective experiences (WU et al., 2011) during the interaction in physical and virtual spaces were also investigated. The last category involved studies on the objects of experience, primarily on #6 and #7 tourism-related content and #8 brand-related content in the context of the experience economy. Tourism is a natural experiential activity and a pioneering representative in the experience economy. Li Jinglong planned the tourism experience hierarchy (Li et al., 2005). Li Yu defined the main objects of tourism experience design (LI, 2010). More researchers conducted case studies on tourism experience design and analyzed tourism as an effective vehicle for the transmission of cultural symbols (HONG & FAN, 2020). Museums as a special experiential field in the tourism process also attracted the attention of many researchers. These studies focused on the digital media era (Ning et al., 2022) to analyze the immersive experience as a narrative path connecting material values to symbolic meanings (WANG & LIU, 2018). In consumption, research primarily dealt with the relationship between the sensory experience of a brand and the audience's cognitive processes (Zhang & Lin, 2020), emotional communication, and scientific management (LUO et al., 2016). Other researchers focused on the development strategies of experience design interventions in new retailing as a new phase of business (LIU & ZHANG, 2020).

6. ANALYSIS OF DOMESTIC AND FOREIGN EXPERIENCE DESIGN RESEARCH TRENDS

Examining both domestic and foreign research can help understand the change in keywords over time and explore the relationship between the inheritance and evolution of research hotspots of experience design. Doing so could also highlight the changing research trends more clearly. The keyword co-occurrence results in the domestic and foreign literature samples were analyzed using CiteSpace for burst analysis. Subsequently, the time zone diagram function was used for plotting to form the results of the

keyword burst comparison. Figure 3 shows the top 25 active keywords in different periods. Figures 4 and 5 illustrate the time zone maps of domestic and foreign keyword co-occurrence.

Top 25 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2002 - 2022
communication	2008	2.24	2008	2013	
acceptance	2010	2.53	2010	2017	
consumer	2011	2.94	2011	2016	
usability	2012	4.73	2012	2015	
beauty	2012	2.4	2012	2014	
user	2012	2.18	2012	2016	
consumer experience	2013	2.01	2013	2015	
system	2011	2.47	2015	2016	
preference	2015	1.98	2015	2017	
dimension	2016	3.21	2016	2018	
performance	2016	2.25	2016	2018	
perception	2012	2.61	2017	2018	
decision making	2017	2.6	2017	2018	
product	2017	2.56	2017	2019	
place	2017	1.97	2017	2019	
user centered design	2017	1.97	2017	2019	
virtual reality	2018	2.63	2018	2019	
response	2018	1.96	2018	2019	
stress	2018	1.96	2018	2019	
health care	2018	1.91	2018	2020	
involvement	2019	2.67	2019	2020	
design thinking	2005	2.71	2020	2022	
hospitality	2020	2.47	2020	2022	
engagement	2020	2.47	2020	2022	
construction	2020	2.14	2020	2022	

Top 25 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2002 - 2022
体验经济	2004	4.09	2004	2010	
情景规划	2004	1.19	2004	2008	
旅游体验	2005	1.8	2005	2010	
体验	2006	2.1	2006	2007	
体验营销	2006	1.65	2006	2010	
设计	2007	1.41	2007	2009	
设计原则	2008	1.29	2008	2009	
主题饭店	2009	1.24	2009	2010	
开发	2009	1.24	2009	2010	
交互	2006	1.57	2011	2012	
儿童	2011	1.57	2011	2012	
产品设计	2006	3.35	2013	2016	
工业设计	2002	1.96	2014	2017	
地域特色	2014	1.12	2014	2015	
情感	2014	1.12	2014	2015	
儿童玩具	2015	1.1	2015	2016	
公共设施	2016	1.47	2016	2018	
品牌价值	2016	1.13	2016	2017	
情感体验	2011	1.33	2018	2019	
人工智能	2019	2.2	2019	2022	
服务设计	2012	1.55	2019	2022	
新零售	2019	1.54	2019	2020	
用户需求	2020	2.71	2020	2022	
积极体验	2020	2.05	2020	2022	
儿童认知	2017	1.1	2020	2022	

Figure 3: Thematic Keyword Burst Analysis of Domestic and Foreign Experience Design Research

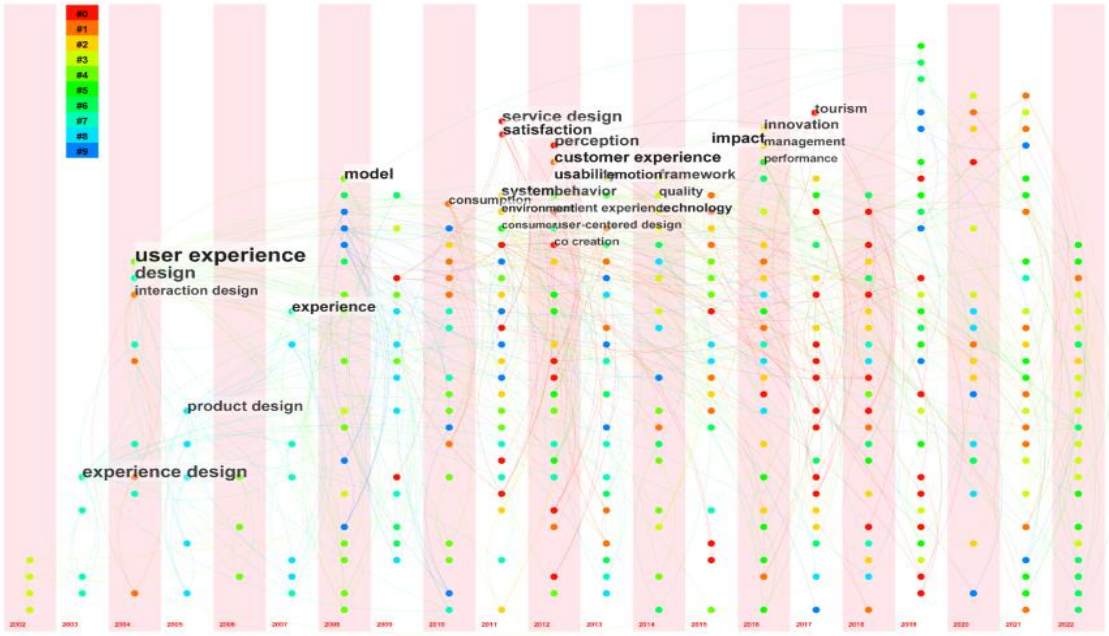

Figure 4: Co-Occurrence Time Zone Map of Keywords in the Foreign Literature Samples

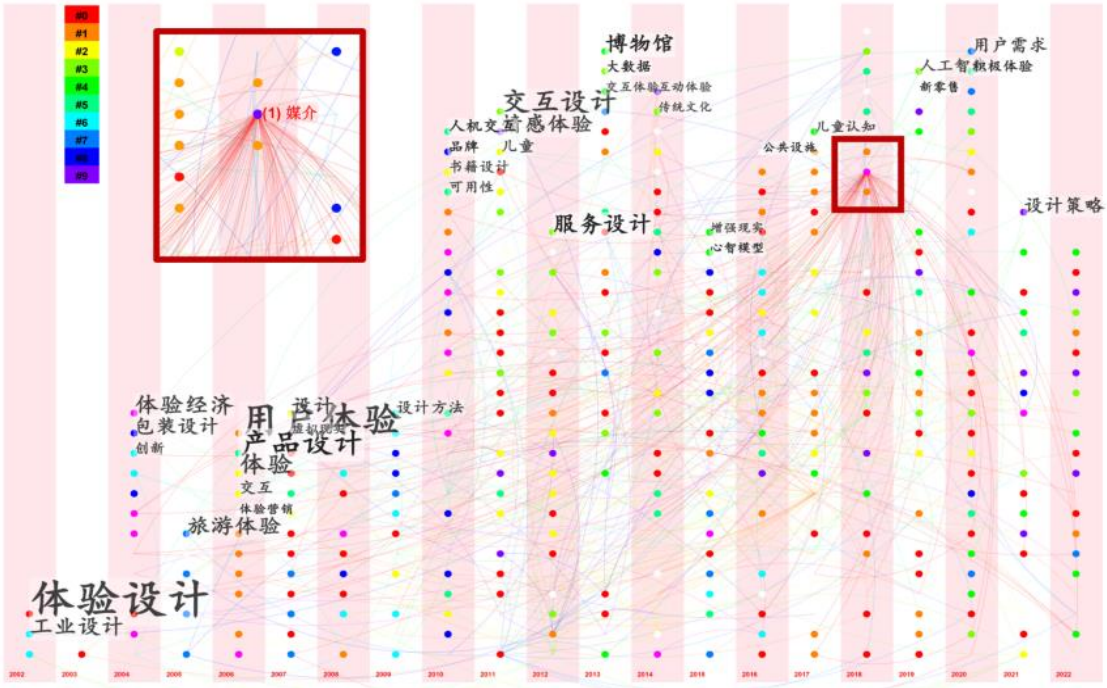

Figure 5: Co-Occurrence Time Zone Map of Keywords in the Domestic Literature Samples

In the enlightenment stage of experience design development (2002-2007), domestic and foreign researchers' knowledge of experience design was based on the foundation of UXD. With Pine's concept of the experience economy, related design researchers soon grasped the economic era shift. The first work that separately linked experience and design was Nathan Shedroff's 2001 book Experience *Design* (Shedroff, 2001), which influenced the definition of experience design from all walks of life in China: "Experience design is the integration of consumer participation into design, in which services are used as a 'stage', products as 'props', and the environment as a 'set', in an attempt to make consumers feel a good experience in the process of business activities." Norman mentioned designing for experiences in his book Design Psychology 2: Living with Complexity (Norman, 2016). According to the burst analysis, domestic researchers paid the most attention to "experience economy" (4.09), which started the earliest and lasted the longest time; it was the most cutting-edge theme in experience design. The second highest intensity of "product design" (3.35) revealed that product design researchers have been hoping for a breakthrough in the level and dimension of design research through the study of experience design. After the advent of color-material-finishing (CMF) theory, human-centered design thinking was emphasized more, and product perception dimensions were enhanced through emotional experiences. At this stage, the domestic researchers were more sensitive to

research under the intersection of disciplines compared to the foreign researchers; they began exploring the integration of experience design with marketing and tourism aspects. In the initial stage of experience design development (2008-2016), under the influence of experience economy and combined with keyword co-occurrence mapping, foreign experience design research mostly focused on three dimensions of customer management, experience evaluation, and theory construction. Jodi Forlizzi and Shannon Ford proposed the "experience as a story," which was developed from the "one experience" proposed by Dewey in his book *Art as Experience*. They proposed a holistic design between people and memory. Hassenzahl and Tractinsky also proposed the meaningfulness of experience and the need to focus on the whole environment as the design object. Forlizzi and Roto proposed that the whole system and the user's perception and cognition of the whole system based on multiple single experience events together become the macro experience content that is constantly updated. Karapanos proposed three stages of experience design: use, integration, and identity. Further, "usability" was the most burst keyword in foreign experience design research (4.73). Therefore, it was one of the key research methods inherited from UXD, and it has remained one of the important research methods in the pre-experience design research stage. In this stage, the domestic experience design researchers seemed to refocus their attention on the UXD. They were more concerned with the exploration of experience practice solutions in different fields using digital interaction technologies. Only Hu Fei and his team (HU et al., 2015) conducted in-depth research on the meaning dimension of experience since 2011 to explore the methods of meaning composition of experience and guide new product development and service innovation. Finally, in 2015, Xin Xiangyang began proposing a new perspective of experience design as the research object (Xiangyang, 2019). In contrast, the succession and development of experience design research by foreign researchers appeared quite structured. The transition from "communication" and "consumer experience" to "decision making" is the gradual shift of experience design on customer experience design in management. In the accelerated phase of experience design development (2017-present), tourism became a hotspot of foreign researchers' attention. The sudden evolution of the keywords "place," "hospitality," and "engagement" related to tourism experience established that foreign researchers entered a new stage of socially innovative development in experience design research. Uysal et al. studied the integration of experience, tourism (Uysal et al.,

2020), and healthcare, and B Neuhofer et al. explored the relationship between economy, experience, and positive emotion through the PERMA model (Neuhofer et al., 2020). Most domestic researchers continued with the general direction of UXD research, highlighting the focus on intelligent design. The zoom in Figure 5 illustrates a keyword with high connectivity that emerged in 2018: medium, suggesting that domestic researchers focused more on practical research on experience design mediums, such as museum cultural communication and digital interactive experiences, emotional experiences, and children's product development. Additionally, the emergence of the term "new retail" in 2019-2020 was noteworthy. Although the suddenness lasted only a year, it was a practical response to the new stage of development of China's Internet-integrated experience economy. Considering the impact of COVID-19 on the offline brick-and-mortar economy starting in 2020, it was expected to re-emerge as a new hotspot for experience design research after China adjusted its epidemic prevention and control management at the end of 2022, thus forming a Chinese solution in the process of experience design research. According to the comparative results of domestic and foreign research in this stage, with the progress of algorithms, foreign scholars also paid attention to the development of interaction and intelligent technology. However, the foreign research process was not shackled by the "user-centered" research boom in UXD and focused more on interaction and intelligent technology as the evaluation tool of experience design rather than the research object and content. Furthermore, foreign research on experience design identified the complexity and multiplicity of experience design and focused on building models, systems, and multidimensional research perspectives. These played an important role in discerning the doctrine and logic for the development of experience design from a design perspective to a new design discipline.

7. CONCLUSION AND PROSPECT

This study comparatively analyzed the research progress in the field of experience design at home and abroad through a bibliometric approach. It also provided an objective and comprehensive review of the knowledge base, research evolution, and hot issues of experience design. However, some of the existing relevant literature was not included in the analysis. The current domestic and foreign research on experience design remains varied and has conducted metaphysical value theory exploration and physical

multidimensional practice development based on the progress of the respective social development. Three aspects of experience design deserve attention in the future.

7.1 Clarify the Key Definitions and Related Concepts of Experience Design

Experience design, as a response to the development of the experience economy, has also been influenced by new technologies and concepts. The essence of experience design is about the creation of meaning, which is an important process affecting the formation of cognition and reflection constructed by people as subjects. The current level of research on the metaphysics of experience design is slightly simple and has not yet broken through the boundaries of UXD. Therefore, it is necessary to get rid of the three experience levels of instinct, behavior, and reflection proposed by Norman as soon as possible, and to logically sort out the different facets required for experience design to build an experience society from a more cross-disciplinary perspective. These methods can lead to a holistic understanding of the human-environment-society dynamic from the micro to the macro level. These can also help form a dismantling study about the research methods needed in the different stages of design practice and theoretical research to support the development of experience design science.

7.2 Propose Targeted Research Methods, From Perspective to Discipline

The shift from studying experience as a commodity to studying the process of human mind travel led the research community to understand that experience design should no longer be understood from a p research perspective; it is equally important to consider where to proceed from the "human-computer interaction." Should we move toward "human-machine integration" or "environment-centeredness," emphasizing the consciousness of "availability"? Therefore, it is necessary to deconstruct the value of experience design, clarify the research content, develop the core disciplinary logic, and form a mature independent research method. This way, experience design can gradually come to the forefront and become a new discipline distinct from UXD.

7.3 Construct a Multi-Level Research Object System and Develop a Disciplinary Discourse of Experience Design with Chinese Characteristics

In China, the research methodology of experience design needs to be

developed and the research objects with a more forward-looking vision of experience design must be defined. The latest research trends in various fields should be keenly captured with the national development strategy as the guide. Additionally, experience design should be integrated and developed with interdisciplinary fields, such as medicine, management, tourism, culture, and ethnology, to clarify the theoretical logic underlying the phenomenon and the connection vein of experience design as well as to reside in the experience design environment of the new retail economic model with Chinese characteristics, thus forming characteristic scientific research. It is also necessary to continuously explore the great kinetic energy of experience design for China's social structure and construct a research discourse system of experience design objects with social innovation, economic development, and national self-improvement as the goals.

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