

Contrasting Advances in Continuing Higher Education Amidst COVID-19—A CNKI and WoS Literature Visual Analysis Across China and the Global Landscape

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Abstract: Based on the analysis of CNKI and WOS core databases (2020-2022), this paper constructs a knowledge map of research keywords related to domestic and international Continuing Higher Education. Using CiteSpace, the study aims to explore disparities between domestic and international research focuses. Findings indicate that international documents exhibit higher quantity and quality. Chinese research primarily emphasizes Continuing Higher Education concepts, implementation forms, and activity carriers, while international research focuses on participant types, driving forces, and the impact of the COVID-19 pandemic. Therefore, it is recommended that domestic scholars conduct extensive and high-quality research, prioritize vulnerable participants, investigate the pandemic's effects on Continuing Higher Education, and promote its development amidst this global crisis.

Keywords: Continuing higher Education; Comparative study; COVID-19; CiteSpace

1. Introduction

China's higher education system has witnessed rapid growth, progressing from the universalization stage to the intermediate stage with an increasing enrollment rate. In 2018, the total enrollment in higher education reached 38.33 million, with a gross enrollment rate of 48.1%^[1]. By 2021, the enrollment had further increased to 44.3 million, and the gross enrollment rate had soared to 57.8%^[2]. This substantial growth in just four years, with an additional 5.97 million students and a 9.7 percentage point increase in the enrollment rate, demonstrates the strong momentum in higher education. The expansion of universal access to education provides a solid foundation for the development of Continuing Higher Education and presents a significant potential student population^[3]. It is estimated that there will be 10.76 million higher education graduates in 2022, representing a year-on-year increase of 1.67 million^[4]. Based on China's higher education development trend, over the next decade, more than 100 million new individuals with higher education will join the workforce^[5]. Combined with the existing 230 million individuals, the potential student population for Continuing Higher Education is impressive in terms of both size and growth. This indicates a promising future for Continuing Higher Education and its potential to become a new growth pole in China's higher education system. However, the sudden outbreak of the COVID-19 pandemic in early 2020 had a profound and immediate impact on global public health and the economy. The world experienced the most severe economic downturn since the 1930s^[6]. The education sector, including Continuing Higher Education, was severely affected. Therefore, exploring the directions and hotspots of international Continuing Higher Education under the influence of the pandemic and comparing the developments and hotspots between domestic and international research becomes crucial for the future of Continuing Higher Education in China and deserves further exploration.

To advance China's Continuing Higher Education research post-global pandemic declaration by WHO, it's crucial to summarize relevant Chinese and international research, explore development contexts, identify research focal points and hotspots, and compare differences between Chinese and international research trends. This study analyzes existing literature from Web of Science and CNKI using CiteSpace data analysis software for visual assessment, discussing domestic and international research specifics and providing a macro analysis of Continuing Higher Education's status in various

countries during the pandemic. This comparative study provides a reference for China's Continuing Higher Education research during the epidemic.

2. Data collection and processing

2.1 Data collection

Literature data collection is a crucial step for network mapping analysis, typically conducted through major scientific and technical literature databases^[7]. In this study, literature on Continuing Higher Education in China under the COVID-19 epidemic was collected from the CNKI (China Knowledge Network) database, known for its comprehensive coverage and fast updates^[8]. A search was performed using the title "Continuing Higher Education" within the timeframe of 2020 to 2022, filtering the results to include articles from relevant disciplines. A total of 299 literature data were collected, including author information, titles, abstracts, and keywords. For international literature data, the Web of Science (WOS) core database was used, which is a reputable platform for accessing global academic information. The search followed a similar approach used by Professor Chaomei Chen. The search period spanned from 2020 to 2022, and the database selected was the Web of Science core collection, with specific citation indexes and categories related to education. The search was conducted in English, resulting in a total of 842 documents collected, including author information, titles, abstracts, keywords, references, and other details.

2.2 Data processing

Keywords Co-occurrence Analysis and Document Co-Citation Analysis were performed on 299 documents from CNKI and 842 documents from WOS. The data processing conditions were as follows: the time range was 2020-2022, the time partition (Year Per Slice) was set to 1, and there were three time zones; the Term Type was set to Burst Terms; the Node Types were set to Keyword, and the Minimum Spanning Tree was obtained. The minimum spanning tree or pathfinder algorithm knowledge graph is obtained.

3. Visual analysis of study results

3.1 Comparative analysis of annual publication volume between China and international

The count and temporal trend of published papers are significant indicators of a research field's development. The annual number of papers issued is collated after repeated screening and verification of Chinese literature data, and the two are compared on an annual basis, as shown in Figure 1. Analysis of papers in Continuing Higher Education from 2020 to 2022 shows an initial focus on pandemic prevention in 2020, with research into COVID-19's effects being nascent. As conditions improved, research into the pandemic's impact and effective measures proliferated, causing a significant rise in published papers in 2021, doubling the 2020 international publications. Predicting from past trends, 2022's publications are expected to surpass 2021. The growing number of papers, both internationally and domestically, indicates increased interest in the pandemic's impact on Continuing Higher Education, a trend likely to persist due to the enduring severity and long-term effects of the pandemic. The annual number of papers issued is collated after repeated screening and verification of Chinese literature data, and the two are compared on an annual basis, as shown in Figure 1.

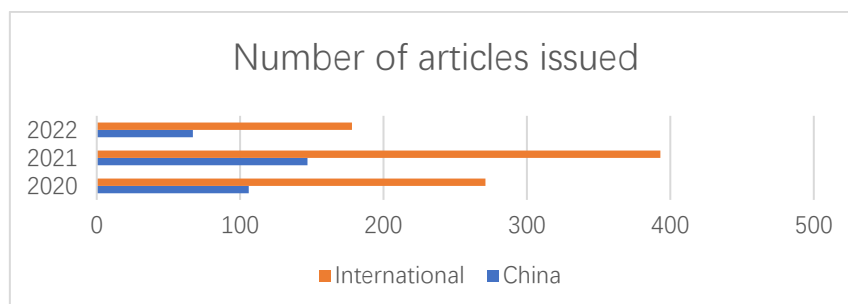


Figure 1: Volume of Chinese and international publications on Continuing higher Education research since the outbreak

3.2 Publication Analysis

The statistical analysis of the sources of all published papers in this research field can not only reflect the depth of research in this research field, but also provide valuable reference for researchers in this research field or readers who want to know this research field to choose journals. At present, the most published journals in this research field in China are the School of Continuing higher Education of Central South University and the Institute of Lifelong Learning and Sustainable Development of Beijing Academy of Education Sciences, with 8 and 5 articles respectively. In addition, this field has also published many high-quality articles in CSSCI journals such as Modern Distance Education and China Distance Education, with a total number of 7 articles, but the proportion is relatively low compared with the total number of articles in this research field. The most published journals in this field internationally are EDUCATION AND INFORMATION TECHNOLOGIES and HIGHER EDUCATION RESEARCH DEVELOPMENT, with 29 and 25 articles respectively. In the JCR category division, the above journals belong to Zone 1 and Zone 2, which shows that international research in this field has higher heat and quality.

3.3 Hot topics in international research on Continuing higher Education

According to the data processing conditions, CiteSpace software was run to obtain the keyword co-occurrence knowledge map of international Continuing higher Education research since the outbreak of the new crown epidemic, as shown in Figure 2. Among them, the circular nodes indicate keywords, and there are 208 keyword nodes in total; the connecting lines between nodes indicate the existence of certain association between keywords, and there are 1004 connecting lines with a density of 0.0466.

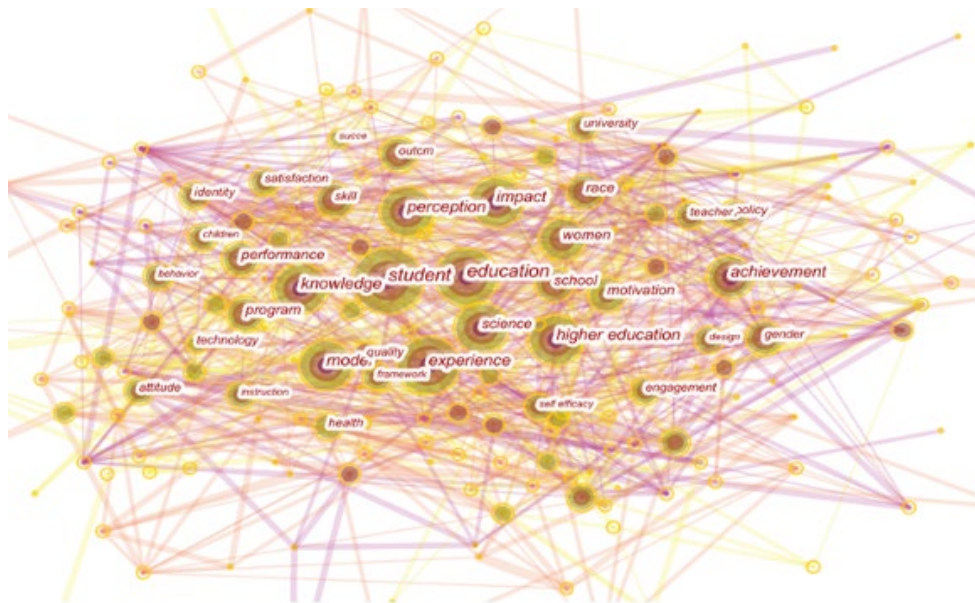


Figure 2: Knowledge mapping of keyword co-occurrence in international Continuing higher Education research since the outbreak

In the knowledge map in Figure 2, the size of the circle indicates the frequency of the keyword, with larger circles indicating more frequent occurrences of the keyword; that is, the greater the probability of the keyword co-occurring with other keywords. Through the analysis of high-frequency keywords, the research hotspots of the discipline can be found [9].

3.3.1 Diversification of participation in further education

Research on Continuing Higher Education in the context of the COVID-19 pandemic has shown a growing focus on women's participation in the field. As of July 1, 2022, there have been 84 articles specifically examining the impact of women's participation in Continuing Higher Education. One study, for example, investigates the relationship between continuing medical education and career development indicators for women, aiming to understand how women's access to Continuing Higher Education relates to their advancement in leadership positions in the medical profession [10]. Furthermore, studies have explored the current status and factors influencing female participation in Continuing Higher Education, considering factors such as wealth and ethnicity. These studies indicate that while the proportion of

women participating in education has significantly increased in both developed and developing countries, gender gaps still persist, especially when considering the influence of poverty and ethnicity. Qualitative longitudinal data surveys have been conducted, focusing on the educational trajectories of young women at the post-secondary level, with Peru as a study site ^[11]. Apart from women's participation, ethnic minorities' inclusion in Continuing Higher Education is another key aspect underlining inclusion and lifelong education principles. Research has delved into the unique role of podcasts as an audio learning medium, particularly valuable for those using them in fragmented timeframes when visual media isn't viable or safe. The necessity for diversity in podcast production, veering away from the dominant white, male perspectives, is emphasized. Qualitative research has probed into the experiences of ten ethnic minority women involved in podcast production in informal education, with the aim of understanding their motivations and sustainability factors. ^[12].

3.3.2 Research on the motive force of the main body participating in Continuing higher Education

In 2022, a public plan was launched in Spain to offer continuing vocational education and training (CVET) courses for unemployed individuals and in-service workers. To understand the motivations of participants in this public plan, a researcher conducted an online survey and used quantitative analysis to statistically analyze the responses. The study revealed that 55.87% of participants reported being highly motivated to engage in further training. Examples of both extrinsic and intrinsic motivation were identified among the highly motivated group. Some participants demonstrated strong intrinsic motivation, expressing a genuine interest in the learning content they were receiving, such as those wishing to improve their English language skills. Others pursued further education for instrumental reasons, aiming to enhance their working conditions. Although the study coincided with the time of the COVID-19 pandemic, it did not explicitly specify the impact of the pandemic on participants' motivations for participation ^[13]. In another study, a researcher examined the status and motivation of online learning in Korea within the context of the COVID-19 pandemic. This research investigated the influence of teacher characteristics (attitudes, competence, and interaction), student characteristics (motivation, mindset, and collaboration), and technology acceptance models (perceived ease of use and perceived usefulness) on students' future behavioral intentions to accept and use e-learning. The study provided valuable insights for stakeholders involved in education during the pandemic ^[14]. Despite 'motivation' being a high-frequency keyword, compared to studies on Continuing Higher Education's subject types and the pandemic's impact, there are fewer investigations into the motivations of subjects in this context. Most don't primarily aim at exploring these motivations, indicating an area deserving of further, in-depth study.

3.3.3 A Study on the Impact of the COVID-19 Global Pandemic on Continuing higher Education

The COVID-19 pandemic has significantly impacted various sectors, including the education system. Studying its effects on further education can promote its development and resilience in the face of crises. Teacher education is crucial as it influences instructional quality and student learning. UK researchers found that the pandemic directly affected primary teacher education. The shift from offline to online teaching during school closures led to challenges, including teachers' unease with online teaching and students' difficulty in fulfilling their desire for face-to-face interaction ^[15]. Medical-oriented continuing education research has also emerged, examining topics such as the impact of the pandemic on online dental education ^[16] and the implementation and assessment of virtual osteopathic medical education conferences in low-resource countries ^[17]. A total of 126 studies on the impact of the epidemic on Continuing higher Education were investigated in the WOS database, representing more than one-eighth of the total number of studies related to Continuing higher Education during the epidemic, reflecting the importance and enthusiasm of this research.

3.4 Hot topics in continuing higher education research in China

According to the data processing conditions, CiteSpace software was run to obtain the keyword co-occurrence knowledge map of China's Continuing higher Education research since the outbreak of the new crown epidemic, as shown in Figure 3. Among them, the circular nodes indicate keywords, and there are 152 keyword nodes in total; the connecting lines between nodes indicate the existence of certain association between keywords, and there are 268 connecting lines with a density of 0.0234.

between China and international English language between 2020 and 2022, it can be found that the number of articles published in the field of Continuing higher Education in China is increasing year by year, but the overall number of articles published is significantly lower than that of international. In addition, according to the comparative analysis of domestic and international publications in this field, it is found that the majority of domestic publications are general journals, with a small number of scholars publishing research papers in this field in core journals and CSSCI, while foreign research papers in this field are mainly published in high-level journals, and the overall quality is higher than ours. Therefore, more domestic scholars should be called upon to carry out high-yield and high-quality research in the field of Continuing higher Education, so as to promote the development of the field of Continuing higher Education in China.

4.2 Strengthening the focus on vulnerable participants in Continuing higher Education

Lifelong education is characterized by diverse participants, especially disadvantaged groups like women and ethnic minorities, reflecting its core concept. International research in Continuing Higher Education highlights participation from these groups, investigating their involvement and forms over the past three years. However, Chinese research lacks focus on this subject participation, particularly disadvantaged groups. Hence, Chinese scholars should explore participation in Continuing Higher Education domestically, emphasizing research on disadvantaged group involvement to enhance participation and actualize the concept of lifelong education.

4.3 Strengthening research on the impact of the epidemic on Continuing higher Education

Since the outbreak of COVID-19, education systems in all countries have been affected, but the impact has also brought new opportunities. In response to the epidemic, countries have taken action to suspend classes and replace offline courses with online courses, not only to solve the problem of students not being able to participate in teaching activities due to the epidemic, but also to provide a precedent and reference for future situations where the educational process is affected by an emergency event. A comparison of observations reveals that both China and the international community have bet on the impact of the epidemic on further education in higher education. However, a review of the literature on both sides reveals that the international community is more concerned with the impact of the epidemic, not only in terms of quantity than in China, but also in terms of the variety of types of education, including the current situation and development of Continuing higher Education in its branches: teacher education, medical Continuing higher Education and other Continuing higher Education, as well as the advantages and disadvantages of online teaching. In China, on the other hand, due to the Strong prevention and control, all fields were less affected by the epidemic, so there were fewer studies on Continuing higher Education in the context of the epidemic. However, the epidemic also provides an opportunity to promote the development of further education in China, and seizing this opportunity may bring unexpected development to further education in China.

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