

A Bibliometric Literature Review of Intercultural Competence From 2002 to 2022

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Abstract

Intercultural competence research focuses on the study of intercultural communication competence as a result of the increasingly interconnected world we live in. In order to have a better understanding of this knowledge domain, a total number of 583 English peer-reviewed articles were obtained from the Core Collection of Web of Science indexed by Social Science Citation Index as well as Science Citation Index Expanded from 2002 to 2022. This bibliometric analysis using CiteSpace is conducted and visualization approaches are used to show the publication trends, major contributing countries, journals, authors, references and hotspots in this domain. Using a graphical to visualize ICC literature in this study might be beneficial for researchers and scholars to track the development of ICC research.

Keywords: Bibliometric Analysis; Intercultural Competence; Bibliometric Literature Review; CiteSpace

1. Introduction

As a result of the increasingly interconnected world we live in, intercultural competence research (ICC) or intercultural communication competence research is growing. In order to understand how this competence is formed, several empirical studies have been conducted using qualitative or quantitative methods and mixed (Méndez García, 2020; Romijn et al., 2021; Shadiev & Yu, 2022; C. Wang et al., 2022). There are several systematic reviews of literature (Avgousti, 2018; Luo & Chan, 2022) and meta-analyses on ICC that have already been published that are constructive (Zhang & Zhou, 2019).

However, the most recent bibliometric literature was conducted in 2018 (Peng et al., 2020), which is four years from now, and all the data was retrieved prior to the outbreak of COVID-19. It has not yet been possible to discover the dramatic impact of the COVID-19 pandemic on ICC research through bibliometric analysis (Kulich et al., 2021; Liu & Shirley, 2021).

As an essential tool for assessing and analyzing researcher's production (Donthu et al., 2021; Ellegaard & Wallin, 2015), bibliometric analysis is capable of managing performance analysis (of researchers, countries, institutions, etc.) as well as science mapping analysis, a

representation of the cognitive and social structure of a particular research area (Cobo et al., 2011).

This study is trying to update this synthesis of ICC research by conducting a bibliometric analysis of peer-reviewed papers extracted from Web of Science using CiteSpace software (Chen, 2006) from 2002 to the end of 2022. The remainder of this paper will consist of details about the data collection and analysis procedures, as well as the discussion and conclusion relating to the study itself.

2. Research Design

2.1 Research Questions

A number of important authors and a large number of influential works have contributed to the development and expansion of research in the ICC over the past twenty years, which has been accompanied by a number of major publications and established research topics. This study consists of an analysis of the major publication countries (regions) and institutions, highly cited authors, journals, works, and research hotspots that have been identified over the past four years as indicators of the dominant traditions and fronts in this field. The following are the specific research questions which need to be investigated in order to answer the following:

- RQ1.* What is the time distribution on ICC research in the last two decades?
- RQ2.* Where are the major publication countries (regions) and institutions in ICC research?
- RQ3.* What are the most highly cited journals in the field of ICC research?
- RQ4.* What are the most highly cited authors in the field of ICC research?
- RQ5.* Which are the most frequently cited references in the field of ICC research?
- RQ6.* What are the research hotspots in the field of ICC research?

2.2 Data Collection

Data for this study was collected from journals indexed by Social Science Citation Index (SSCI) as well as Science Citation Index Expanded (SCI-E) in the Web of Science Core Collection. As a first step, the searching keywords were identified as "intercultural competence" OR "intercultural communication competence" OR "intercultural communicative competence" OR "global competence" and the time frame was set between 2002 and 2022. The database has been selected as "Web of Science Core Collection - SSCI". As a second step, the retrieved papers were refined as follows: the document type was refined into "article" and the language was refined to "English". Thirdly, author, title, source, abstract, citation, and other data were extracted and saved as plain text for processing by CiteSpace. Finally, after the removal of duplication by CiteSpace, a total of 583 valid papers were obtained to analysis. Data for the samples has been updated until November 24, 2022.

2.3 Data Analysis

As Peng et al. (2020) claimed, the expanded knowledge domain of ICC research in the 21st century necessitates a comprehensive and systematic review of papers on the field. As a way of filling this gap, this paper will conduct a bibliometric analysis using CiteSpace 6.1.R4

Basic Version (Chen, 2006) in order to analyze the publication countries(regions), highly cited journals, co-cited authors, cited references and research hotspots.

The use of bibliometric analysis is a popular and rigorous method of exploring and analyzing large volumes of scientific data (Moral-Muñoz et al., 2020). It is both a quantitative approach and data visualization approach, which will provide insightful information for researchers in this field.

The data analysis and visualization procedures are as follows:

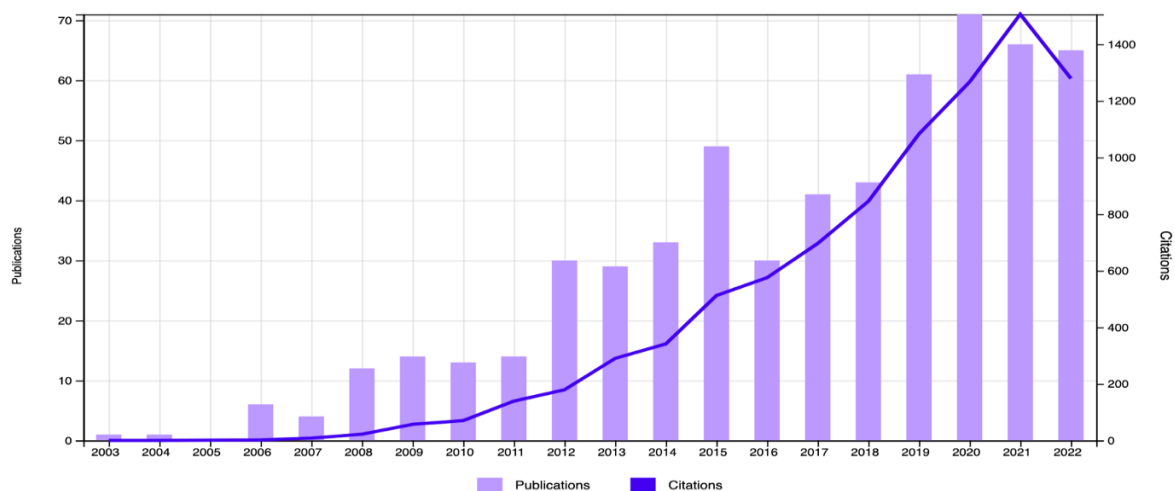
Firstly, generating time distribution of published papers. Then, by drawing different sizes of nodes, a knowledge map is created to present the number of publications, and the number of rings around each node represents the date of publication (Chen, 2014). The centrality of all nodes in a network is calculated, which reflects the importance of the node's location in the network. In this map, countries (regions) and institutions are analyzed quantitatively, as well as highly cited journals and authors, and research hotspots. As a final note, some significant articles in major clusters are discussed as well as the results of this research.

3. Results and Discussion

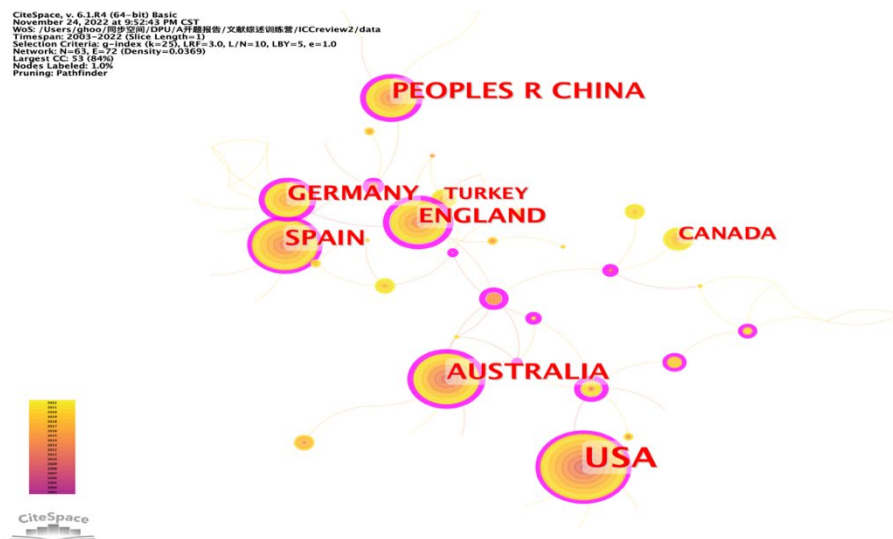
3.1 Time Distribution of Published Papers

Figure 1

Time Distribution of Publication and Citation in ICC Research



As we can see from Figure 1 with 583 records collected, there has been a growing trend from 2003 to 2022 in publications and citations in the field of ICC research. This trend reached its peak in 2020 and 2021, with the publication of 71 articles and 1267 citations, and 66 articles and 1506 citations respectively. From this trend, we can see no decline but growth in ICC research as a response to COVID-19.

Figure 2*Knowledge Map of Countries (regions) in ICC Research*

3.2 Major Publication Countries (Regions) and Institutions in ICC Research

This section provides an overview of major publication countries (regions) and institutions, as well as an indication of their centrality in ICC research.

As shown in Figure 2, countries have contributed to the body of knowledge in this field in different extent. Among them, the USA and China contribute the most, followed by some European countries, such as Spain, England and Germany. The contributions of Canada and Australia to this field have also been significant.

A detailed ranking of publication counts and centrality in different countries and regions is shown in Table 1. The USA has the highest number of publications of 184, which means its contributions are the highest in quantity. The following countries are China (58 publications), Australia (50 publications) and Spain (49 publications).

Moreover, analyzing from the perspective of centrality is essential. Having a high betweenness centrality score is a useful indicator of how clusters are interconnected (Chen, 2014). Finland (0.46), England (0.45), Japan (0.42) and Sweden (0.40) are more prominent nodes in the network of ICC research. It follows that the highest publications do not always have the same impact in this field, Since the USA has a centrality of 0.16 and China has a centrality of 0.32.

Table 1 Research countries (regions) in ICC

Rank	Count	Centrality	Countries/Regions
1	184	0.16	USA
2	58	0.21	PEOPLES R CHINA
3	50	0.21	AUSTRALIA
4	49	0.20	SPAIN
5	40	0.45	ENGLAND
6	38	0.39	GERMANY
7	20	0.00	CANADA
8	18	0.05	TURKEY
9	17	0.00	TAIWAN
10	17	0.05	NETHERLANDS
11	16	0.42	JAPAN
12	15	0.46	FINLAND
13	10	0.00	ISRAEL
14	9	0.40	SWEDEN
15	9	0.11	SOUTH KOREA

Not surprisingly, there is a correlation between the top contributing institutions and the most influential countries. Among them, the Arizona State University (5 publications), the University Connecticut (4 publications) and the Boston University (3 publications) from the USA are making the most number of articles in this field. Additionally, Bournemouth University in England (4 publications) and University Jaen in Spain (4 publications) are the two leading European institutions. The remainder of the top contributing institutions are University of Queensland (4 publications) and Macquarie University (3 publications) from Australia, Chinese University of Hong Kong (3 publications) from Hong Kong, Kansai University (3 publications) from Japan, and the Middle East Technology University (3 publications) from Turkey.

The placement of countries and institutions shows an obvious pattern: most ICC researchers come from Western European, North American, East Asian, and Australian countries, which are not culturally diverse.

Table 2

Research Institutions in ICC

Rank	Count	Institutions	Countries/Regions
1	5	Arizona State Univ	USA
2	4	Bournemouth Univ	England
3	4	Univ Connecticut	USA
4	4	Univ Jaen	Spain
5	4	Univ Queensland	Australia
6	3	Boston Univ	USA

7	3	Chinese Univ Hong Kong	Hong Kong
8	3	Kansai Univ	Japan
9	3	Macquarie Univ	Australia
10	3	Middle East Tech Univ	Turkey

3.3 Highly Cited Journals, Authors and References

This section discusses the most influential journals, authors and references in this field. A graph of the most cited journals are generated according to the frequency and percentage of citation. Then, the Citation Bursts Detection functions is used in order to figure out those rapidly growth of citations. Finally, a clustering analysis of authors are conducted. Research on ICC has been published in highly cited journals in a variety of disciplines, including intercultural communication, education, applied linguistics, sociology, and psychology.

Figure 3

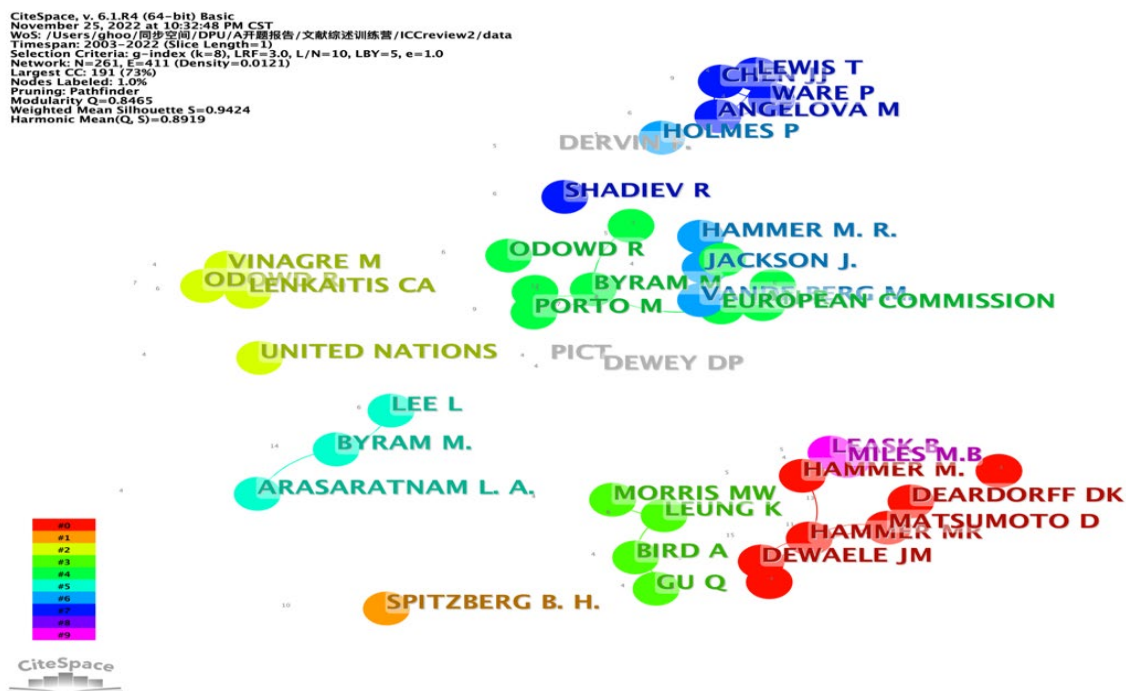
Highly Cited Journals in ICC Research



Figure 3 reflects the most cited journals and its percentage in this area. The *International Journal of Intercultural Relations* has 60 articles published in ICC, followed by *Language and Intercultural Communication* (39 articles), *Journal of Studies in International Education* (21 articles) and *Foreign Language Annals* (18 articles)

The citation frequency of an author and centrality in a social network can be considered indicators of an author's influence in a field. By performing a clustering analysis in CiteSpace, significant authors are revealed as in Figure 4. Hammer (0.33 centrality), Bryam (0.62 centrality in total) and Deardorff (0.26 centrality) are the top three contributors in ICC research. In Hammer's article, a measure of cultural sensitivity was constructed as part of the Intercultural Development Inventory (Hammer et al., 2003). Bryam is famous for his propose of developing the concept of intercultural citizenship (Byram, 2006) and cultural education (Byram, 2010). Meanwhile, Deardorff presented a brief overview of intercultural competence in his time and attempted to formulate an agenda for the future (Deardorff, 2015).

Figure 4
Knowledge Map of Highly Cited Authors in ICC Research



Citation bursts are an indication of a more active research area. It is the detection of a sudden increase in citations, which can last for a number of years or a single year. Citation bursts indicate that a particular publication has been cited rapidly (Chen, 2014).

Figure 5
Citation Bursts of Top Authors

Top 7 Cited Authors with the Strongest Citation Bursts

Cited Authors	Year	Strength	Begin	End	2003 - 2022
BYRAM M.	2006	3.59	2010	2012	
SPITZBERG B. H.	2009	5.19	2012	2014	
VANDE BERG M.	2009	4.22	2014	2015	
MATSUMOTO D	2013	4.47	2015	2018	
CHEN JJ	2016	3.24	2018	2019	
PORTO M	2017	3.16	2018	2022	
DEARDORFF DK	2015	4.22	2020	2022	

As can be seen from Figure 5, there are seven significant authors who have bursts in their citations. Byram's burst started from 2010 to 2012, Spitzberg and Chen JJ's bursts have similar length of two years. As for the bursts in Matsumoto and Porto, the former was from

2015 to 2018 and the latter was from 2018 to 2022. Same as Porto, Dearforff's burst cited from 2020 to 2022, which continued till 2022. This marks Porto and Deardorff the two most prominent authors in the latest research in ICC research.

3.4 Analysis of Research Hotspots

This section focuses on major keywords in ICC research as well as clusters created by CiteSpace software in this area. Also included are some noteworthy articles.

As bibliometric analysis is able to provide information about a knowledge domain, which can be understood as a broad concept that encompasses a scientific field. Accordingly, a keyword analysis was conducted in order to generate Figure 6 which illustrates certain frequently occurring keywords and significant clusters. The keyword display was set into "By Degree" and the "Threshold" was set to 5 to present current keywords. As an example, there are "communication", "education", "international students", "adjustment" and "acculturation" etc.

Keywords, however, can only portray part of the picture. So we attempted to cluster these keywords using the Log-Likelihood Ratio (LLR) to achieve this. A graph of the results shows ten clusters. The most significant clusters are:

#0: Intercultural communication competence

This is the largest cluster and has 25 members, i.e. 25 articles, and a silhouette value of 0.923. A cluster's silhouette value is a measure of the quality of its clustering configuration between -1 to 1, higher value represents better solution. The most cited article of this cluster is Scale characteristics of intercultural competence measures and the effects of intercultural competence on prejudice by (Genkova et al., 2021). This article attempts to broaden the measures of ICC to Eastern European countries like Hungary, Serbia and Czech Republic. It compared two widely used scales, the cultural intelligence scale (CQS) and the multicultural personality questionnaire (MPQ), to explore their influences on prejudice.

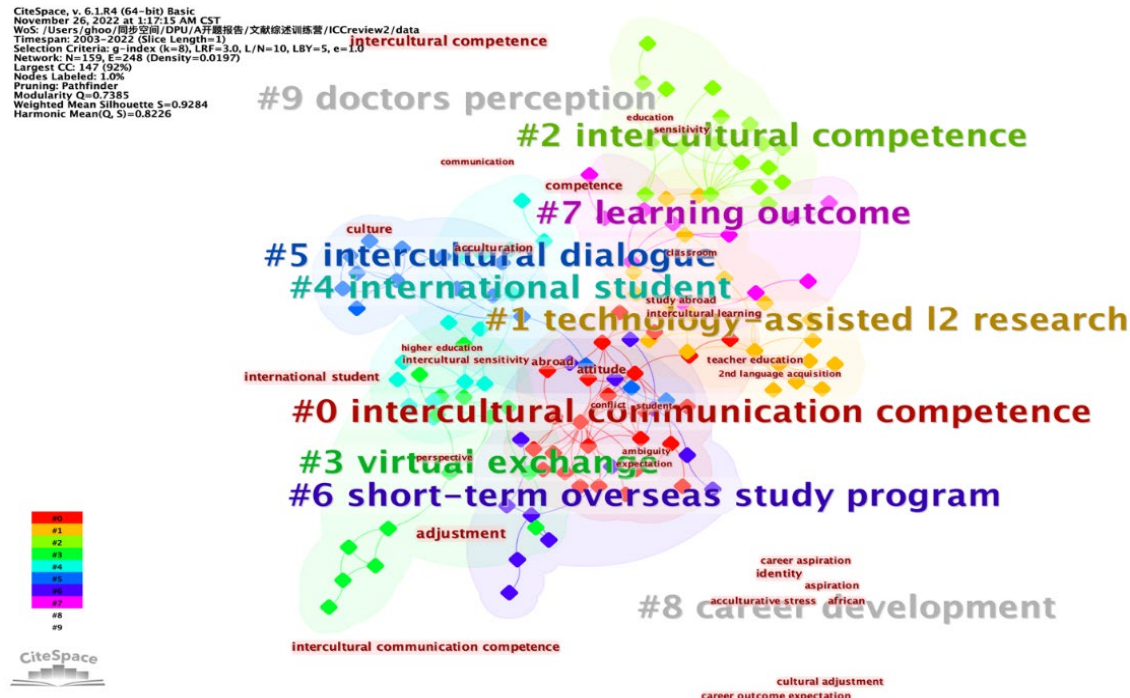
The significance of this article lies in that it addresses a geographical area that has been underdeveloped in ICC research and fills in the blank space in Figure 2. It argues that equivalence between Eastern and Western European cultures cannot be assumed.

#1: Technology-assisted L2 research

The second largest cluster has 20 members and a silhouette value of 0.912. The technology-assisted L2 research is well defined in (Marijuan & Sanz, 2017). Both in the product of learning area and the cognitive process of learning, technology-assisted L2 (second language) research plays a critical role. This paper overviews some popular technology applied in L2 research. In spite of the fact that technology is always changing, and this 2017 overview may not reflect some latest applications following the transformation of online teaching after COVID-19 (Liu & Shirley, 2021), the article and cluster contributed to knowledge about teacher education and second language acquisition.

Figure 6.

Knowledge map of research hotspots in ICC



#2: Intercultural competence

The major article in third cluster is a bibliometric analysis of cross-cultural analysis similar to present study while using different data collection and visualization approaches. (J. Wang & Zhang, 2022) are more focused on cross-cultural learning and cross-cultural training instead of intercultural competence. “Cross-cultural learning” is the only keyword searched in this study. And the use of R language and the “Biblioshiny” package will certainly produce different but equally meaningful graphs and analyses as using CiteSpace.

This article is an epitome of current ICC research that demonstrates its rich technology perspective. It is also evident from this high number of citations that bibliometric analysis is useful in this field.

#3: Virtual exchange

The third largest cluster has 15 articles and a silhouette value of 0.908. The major research in this cluster is investigating Virtual Exchange as a way of communication when face-to-face interactions are not convenient (Lenkaitis, 2022). Similar to another highly cited article in the fifth cluster by (Ortiz-Marcos et al., 2020), Lenkaitis is also seeking to connect intercultural competency and learning to the UN's Sustainable Development Goals. In the future, SDG research could greatly benefit from this.

4. Conclusion

The aim of this study was to identify the knowledge domain based on a comparison of the temporal distribution of documents, the cited countries, the cited journals, the cited authors, the cited references, and the hotspots in the field of ICC research between 2002 and 2022. In order to accomplish this goal, bibliometric analysis software CiteSpace was used to generate graphs and matrices that represent the knowledge domain in the ICC research field. The study can serve as a handy resource for future researchers in ICC to gain a better grasp of the general trend as well as the recent burst of citations about contemporary topics. Using the same software, we extended the previous similar bibliometric analysis for four more years from 2018 to 2022, making this a bibliometric literature review of the ICC with a more in-depth exploration.

Inevitably, there are some limitations to this study. The keywords used in searching this domain are limited, and it is possible there could be better keywords to include more valuable studies. Also, bibliometric analyses and reviews lack depth in nature. While the present study attempts to look deeper into major authors and articles within each cluster, it is unable to overcome the disadvantage of a narrative analysis.

Future research could apply more accurate and inclusive keywords for better search results. Additionally, researchers in this field may use this study to assist with their future in-depth studies in order to gain a better understanding of intercultural competence.

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