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MAPPING THE LANDSCAPE OF CONTINUING EDUCATION RESEARCH IN ASIA: A BIBLIOMETRIC ANALYSIS OF SCOPUS-INDEXED PUBLICATIONS FROM 1972 TO 2023

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Abstract

Continuing education (CE) plays a crucial role in workforce development and economic growth across Asia, yet the landscape of CE research in the region has not been comprehensively mapped. A comprehensive bibliometric analysis of continuing education (CE) research in Asia from 1972 to 2023 was carried out, utilizing data from the Scopus database to map the evolving landscape of CE research in the region. Findings revealed a significant surge in research output since the late 1990s, with East Asian countries, particularly China, Hong Kong (China), and Taiwan (ROC), emerging as leaders in the field. The analysis uncovers several key patterns: institutional collaborations tend to cluster regionally, there's a noticeable generational gap in researcher's networks, and the healthcare sector dominates CE research topics. Recent trends indicate a shift towards digital learning approaches and learner-centered methodologies. The study also highlights the need for increased cross-border collaborations and expansion of CE research beyond the healthcare sector. This research contributes to a deeper understanding of CE research trends in Asia and provides insights for future directions in the field.
Keywords: *Asia, bibliometric analysis, collaboration networks, continuing education, digital learning, healthcare education, lifelong learning, research trends, science mapping, Scopus database*

Introduction

Over the past few decades, continuing education (CE) has gained significant prominence in Asia's educational landscape. CE refers to a broad range of post-secondary learning activities and programs. UNESCO and UNESCO Institute for Lifelong Learning (UIL) describe CE as "a core component of lifelong learning. It comprises all forms of education and learning that aim to ensure that all adults participate in their societies and the world of work" (UNESCO & UIL, 2015, p.6) and in the same report, the terms "lifelong learning", "adult learning and education", and "continuing education" are used interchangeably. All three concepts emphasize

ongoing learning beyond traditional schooling, with lifelong learning increasingly adopted as an overarching framework in which continuing education plays crucial roles.

CE programs have emerged as a vital alternative for individuals seeking to enhance their knowledge and skills beyond formal education, offering flexibility that traditional learning models often lack (Knowles et al., 2015). These programs may be offered by conventional universities and specialized CE institutions (Parellada & Sanromà, 2000), community learning centers (Belete et al., 2022), or through fully online platforms (Donavant, 2009). The scope of CE is extensive, encompassing various forms of learning across different life stages and professional contexts: professional development (Daley & Cervero, 2016), adult basic education (UIL, 2013), higher education for non-traditional students (Schuetze & Slowey, 2002), citizenship education (UIL, 2022), senior education (Findsen & Formosa, 2011), and personal interest and hobby-based learning.

According to recent estimates, the CE market in Asia is experiencing rapid growth, with millions of learners participating in various forms of CE across the region (Ra, 2015). Several factors have contributed to the development and expansion of CE in Asia. Technological advancements play a crucial role, with the increasing prevalence of the internet enabling learners to access educational opportunities without geographical constraints. Moreover, the rapidly changing job market in many Asian countries has created a pressing need for continuous skill updates and upgrades, making CE an essential component of career development and economic growth (UIL, 2018).

Several Asian countries have implemented policies to enhance continuing education, recognizing its crucial role in workforce development and economic growth (UIL, 2018). In Singapore, the SkillsFuture initiative, launched in 2015, provides citizens with opportunities for lifelong learning and skills development (Tan, 2017). Vietnam is recognized as having the highest number of community learning centers in Southeast Asia (Belete et al., 2022), and this achievement is supported by several legal frameworks from the Vietnamese government, emphasizing the importance of social participation in education outside of traditional schools. China's National Plan for Medium and Long-term Education Reform and Development (2010-2020) and the recent China Education Modernization in 2035 policy emphasized the importance of building a lifelong learning society (Sun & Yuan, 2023). South Korea has consistently promoted lifelong education since 2002, with its latest Fifth Lifelong Education Promotion Plan (2023-2027) aiming to foster customized learning while preparing for digital transformation and an aging society (Korean Ministry of Education, 2023). Japan also focuses on recurrent education to address rapid technological changes by the Next-Generation Human Resources Development Program (MEXT, 2016). In India, the National Skills Development Policy 2015 aims to expand, modernize, and improve the quality of skill development and vocational training programs (Indian Ministry of Skill Development and Entrepreneurship, 2015). These policies reflect a growing recognition across Asia's need for robust continuing education systems to support economic development and social progress.

Over the past decades, regarding CE in Asia, researchers have paid particular attention to various aspects, including program development (MacKinnon, 2012; Zhang & Ng, 2006), policy concerns (Kennedy, 2004; Sangiumvibool & Chonglerttham, 2017), learners' perspective (Muniandy et al., 2018; Pang & Lee, 2013), and the impact of new technologies on teaching and learning (Lin et al., 2013; Wu et al., 2023). However, to the best of our knowledge, there has yet to be a comprehensive systematic review providing a holistic view of the current literature on CE in Asia. Therefore, this study aimed to address this research gap by attempting to answer the following research questions (RQs):

- RQ1: What are the prevailing trends in CE research in Asia over the past decades?
- RQ2: How do countries, institutions, and authors collaborate in the field of CE in Asia?
- RQ3: Who are the leading authors, and what are Asia's most influential publications in

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CE research?

- RQ4: Which are the primary sources of CE research in Asia?
- RQ5: What key themes and emerging trends can be identified in CE research in Asia?

Research Methodology

Bibliometric Analysis Approach and Data Source

This study employed a bibliometric analysis approach to examine the landscape of CE research in Asia from 1972 to 2023. Bibliometric analysis is a quantitative method used to analyze academic literature, providing insights into publication patterns, research trends, and collaboration networks within a specific field (Pritchard, 1969). Several educational studies have employed this method to explore the research landscape of particular topics, such as employability (Dinh et al., 2022), internationalization in higher education (Thi Thu Le et al., 2024), microlearning (Pham et al., 2024), and teachers' well-being (Tran et al., 2024). This method was particularly suitable for capturing trends, collaboration patterns, influential documents, authors, and sources, and identifying key themes and emerging topics in research about CE in Asia.

Scopus is one of the most comprehensive abstract and citation databases, covering various disciplines, including science, technology, medicine, social sciences, and humanities. It stands out for its extensive coverage, citation analysis tools, regular updates, user-friendly interface, and interdisciplinary reach. Compared to other databases like Web of Science and Google Scholar, Scopus offers a broader array of journals and conferences, particularly in emerging fields, and provides more sophisticated tools for data analysis and citation tracking (Falagas et al., 2008). Utilizing Scopus as the primary data source for this bibliometric study ensured access to a vast, high-quality, and current dataset, which is vital for conducting an accurate and meaningful analysis of the CE research landscape in Asia. Its broad scope allows for a comprehensive view of CE research across various disciplines.

Data Selection Procedure

The literature search utilized the following keywords: "continuing education" in combination with Asian country names and regional terms. The search query was structured as follows:

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TITLE-ABS-KEY ( "continuing education" ) AND TITLE-ABS-KEY ( "Chin*" OR "Indonesia*" OR "Japan*" OR "Philippin*" OR "Vietnam*" OR "Thai*" OR "Myanmar" OR "South Korea*" OR "Malaysia*" OR "North Korea*" OR "Cambodia*" OR "Lao*" OR "Singapore*" OR "Timor Leste*" OR "Brunei*" OR "Taiwan*" OR "Hong Kong" OR "Macau" OR "CentralAsia" OR "Eastern asia" OR "South-Eastern Asia" OR "Asia*" OR "Indochina" ) AND ( LIMIT-TO ( PUBSTAGE , "final" ) ) AND ( LIMIT-TO ( SUBJAREA , "SOCI" ) OR LIMIT-TO ( SUBJAREA , "PSYC" ) OR LIMIT-TO ( SUBJAREA , "BUSI" ) OR LIMIT-TO ( SUBJAREA , "ARTS" ) OR LIMIT-TO ( SUBJAREA , "MULT" ) OR LIMIT-TO ( SUBJAREA , "ECON" ) OR LIMIT-TO ( SUBJAREA , "DECI" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) OR LIMIT-TO ( DOCTYPE , "ch" ) OR LIMIT-TO ( DOCTYPE , "cp" ) OR LIMIT-TO ( DOCTYPE , "bk" ) ) AND ( EXCLUDE ( PUBYEAR , 2024 ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) )
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The study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2010) for the selection of relevant publications (see Figure 1). The initial search yielded 1,841 documents. After applying the inclusion and

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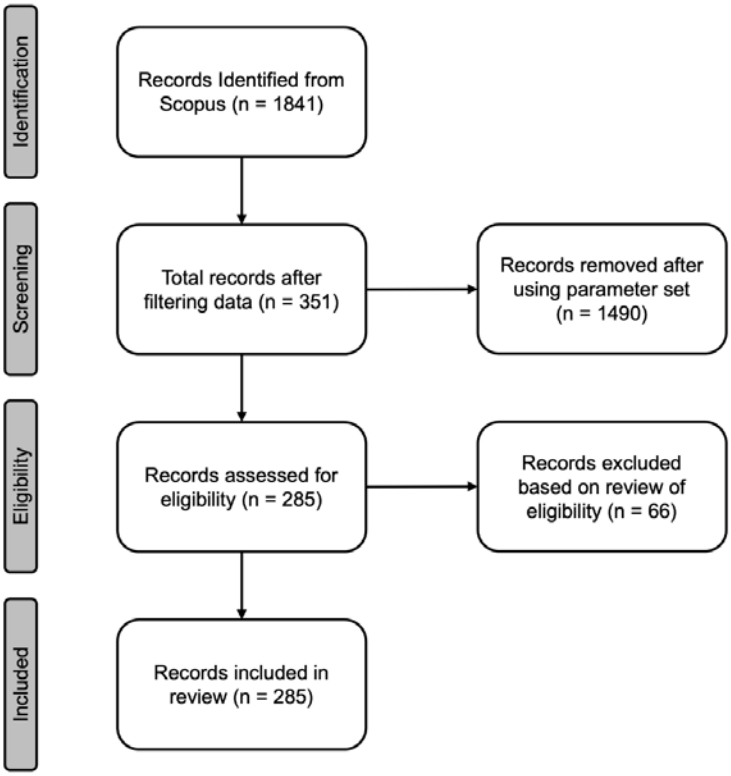
exclusion criteria, 351 documents remained. These were then manually screened for relevance to CE in Asia, resulting in a final dataset of 285 documents, forming the knowledge base for this analysis. This screening process ensured that only the most relevant documents were included in the study, providing a focused dataset for analysis.

Figure 1
PRISMA Flow Diagram for Study Selection Process



Data Analysis Process

Microsoft Excel was used for initial data management and basic statistical analysis. VOSviewer software was employed to construct and visualize bibliometric networks (van Eck & Waltman, 2010). This tool helps to construct and visualize bibliometric networks based on bibliographic coupling, co-authorship, and keyword co-occurrence. This multi-faceted approach allowed for a comprehensive understanding of the CE research landscape in Asia.

Research Results

Publication Trend and Type of Documents

The analysis of CE-related publications in Asia revealed a distinct growth pattern over the past five decades (see Figure 2). The publication trend can be divided into two phases:

- Phase 1 (1972-1997): This initial stage was characterized by sporadic publications. The first documented publication appeared in 1972, but many subsequent years saw no output. During this 25-year period, most years recorded only 0-1 publications, with occasional spikes such as 3 publications in 1984 and 7 documents in 1994.

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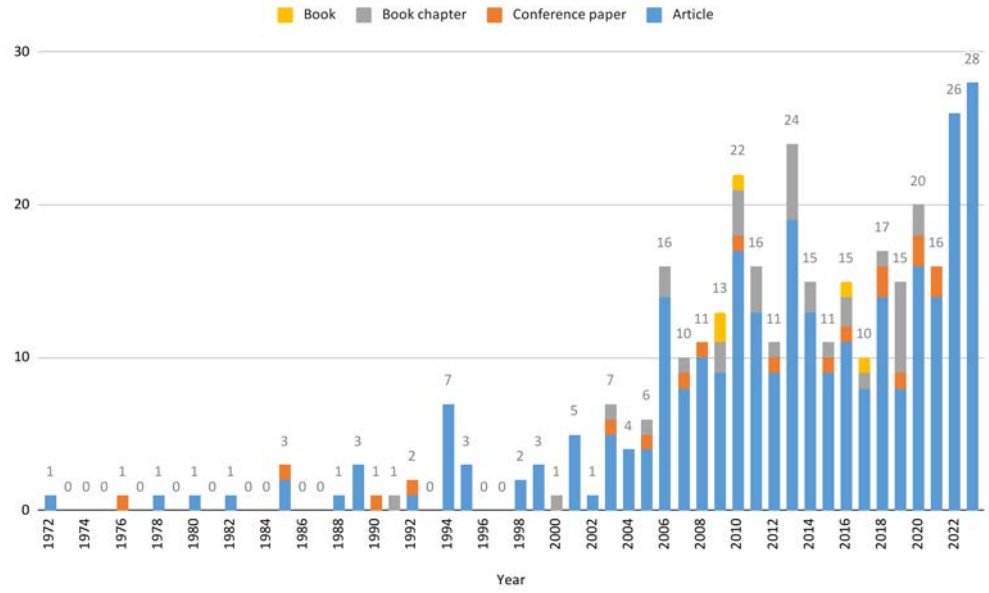
- Phase 2 (1998-2023): This phase saw a dramatic increase in volume of publications. This period witnessed a consistent annual output and substantial growth in research production, showing a consistent upward trajectory in research output. However, the fluctuation in publication numbers throughout this phase, with some years showing dips followed by recoveries (e.g. 11 publications in 2012 and 10 publications in 2018).

Figure 2
Annual Publication Trend in Continuing Education Research in Asia (1972-2023)



The distribution across different types of documents (book, book chapter, conference paper, and article) underscores the multidimensional nature of scholarly contributions within the broader scope of CE research in Asia. The predominance of journal articles suggests a preference for this format in disseminating research findings in the field.

Network of International Collaboration

The analysis of international collaboration in CE research in Asia revealed a complex network of partnerships and contributions from various countries. The scientific map generated by VOSviewer depicts global scientific collaboration, showcasing clusters of countries with varying extents of research ties. Larger nodes signify countries with significant research output, while thicker lines connecting nodes indicate closer collaboration. The number of lines reflects the extent of connections with other countries. Node color reflects the average publication year, indicating each country's active research period.

China, Hong Kong (China), and Taiwan (ROC) stood at the forefront of CE research in Asia. China's substantial publication output, securing the first position with 62 documents (see Table 1), and its position in the scientific map underscores its central role in the collaborative network and its considerable connectivity with other nations (see Figure 3). Hong Kong (China) and Taiwan (ROC) follow closely, with 43 and 37 documents, respectively, further emphasizing the significant contributions from these regions.

Anglophone countries such as the United States, the United Kingdom, and Australia

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emerged as prolific contributors to research in this field, boasting significant publication counts of 33, 19, and 22 documents, respectively. Moreover, these nations also occupy top positions in citation counts, their prominence is further highlighted by the sizable nodes representing them in the scientific map and their extensive collaboration with Asian countries. This global collaboration is complemented by significant intra-Asian partnerships, with China, Hong Kong (China), Taiwan (ROC), and the US forming a central network.

Notably, Singapore stood out as a central player in this network. Despite not being the largest node, Singapore's position was prominent, with a relatively large node size indicating substantial research output. The yellow color of Singapore's node is particularly significant, suggesting that Singapore has become increasingly active in CE research in recent years. Singapore's extensive network connections are also noteworthy, including but not limited to Australia, the United States, the United Kingdom, and several Asian nations.

Countries such as South Korea, Japan, and Malaysia showed growing contributions to the field, both in terms of publications and collaborative efforts, indicating an expanding research landscape across Asia. The top 10 list includes a mix of East Asian, Southeast Asian, and Western countries, reflecting the global nature of research in CE in Asia.

Table 1

Top 10 Countries Contributing to Continuing Education Research in Asia by Number of Documents and Citations

Rank	Country	Number of Documents	Rank	Country	Number of Citations
1	China	62	1	Taiwan (ROC)	589
2	Hong Kong (China)	43	2	Hong Kong (China)	515
3	Taiwan (ROC)	37	3	China	439
4	The United States*	33	4	The United States*	345
5	Australia*	22	5	The United Kingdom*	197
6	Singapore	22	6	Australia*	148
7	The United Kingdom	19	7	South Korea	110
8	Japan	13	8	Thailand	97
9	Canada*	12	9	Indonesia	93
10	Malaysia	12	10	Canada*	77

Note: Countries with * are non-Asian

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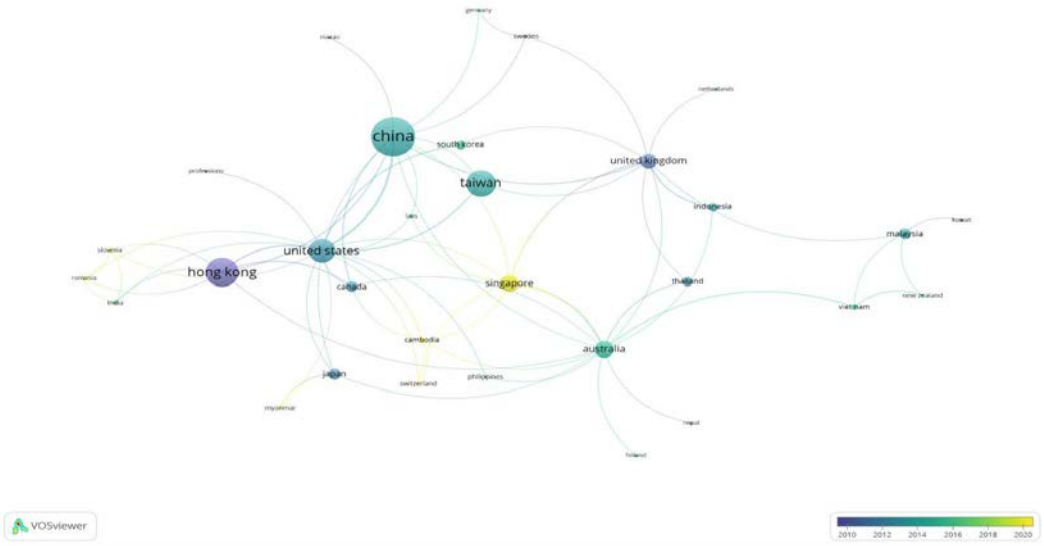
Figure 3

International Collaboration Network in Continuing Education Research in Asia



The institutional collaboration network in CE research in Asia revealed patterns that both reinforce and refine the observations made at the country level. East Asian dominance remains evident, with numerous institutions from China, Taiwan (ROC), and Hong Kong (China) prominently featured on the map (see Figure 4). This institutional representation aligns closely with the strong presence of these countries observed in the earlier country-level analysis.

The University of Hong Kong emerged as the undisputed leader in the field (see Table 2), ranking first in both the number of documents (26) and citations (363). Its prominence is visually striking on the scientific map, where it appears as the largest node with extensive connections to other institutions. This central position and numerous links underscore its critical role in CE research in Asia, mirroring Hong Kong's significant influence observed in the country-level network. The Chinese University of Hong Kong follows closely, ranking second in both metrics with 11 documents and 166 citations, further solidifying Hong Kong's pivotal role.

However, unlike the more interconnected country-level network, the institutional network is characterized by numerous smaller, more dispersed clusters. These clusters often exhibit a regional or national character. For instance, one cluster primarily includes Taiwanese institutions such as National Taiwan Normal University, National Taipei University of Nursing and Health Sciences, and Chang Gung University, while another features Korean institutions like Chung-Ang University and Yonsei University. The presence of Western institutions in the network, though less prominent, remains significant. Griffith University (Australia) and the University of British Columbia (Canada) appear in both the document count and citation lists; their connections to various Asian institutions in the map highlight the international nature of CE research in Asia, consistent with the global collaborations observed at the country level.

A distinctive feature of the institutional network is the diversity of organization types represented. While universities predominate, there's notable participation from other sectors, particularly healthcare. The inclusion of institutions like Chang Gung Memorial Hospital and various nursing schools, such as the National Taipei University of Nursing and Health Sciences.

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Table 2

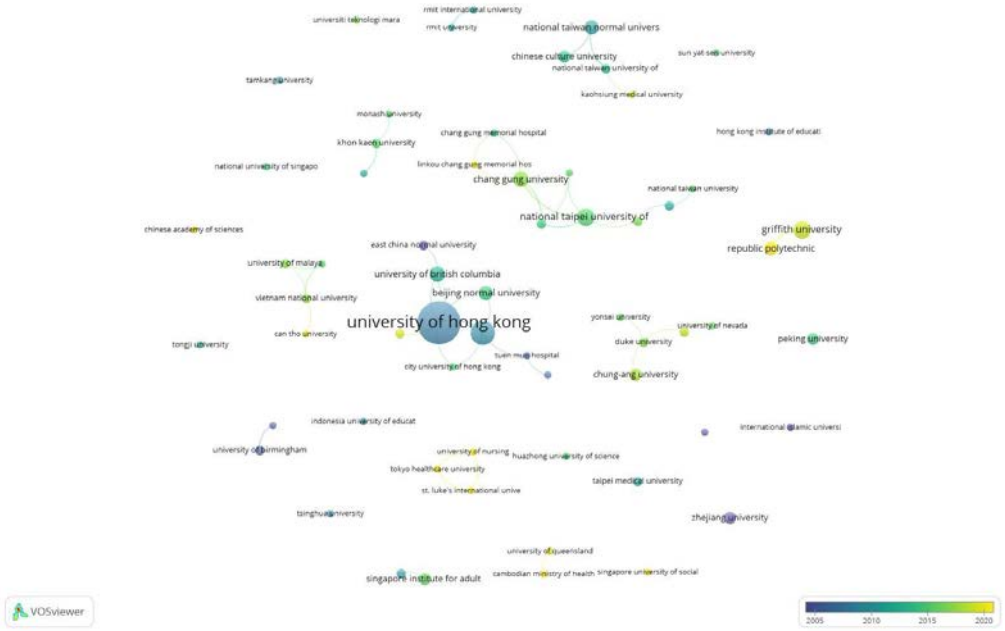
Top Institutions Contributing to Continuing Education Research in Asia by Number of Documents and Citations

No	Affiliation, Country	Documents	No	Affiliation, Country	Citations
1	University of Hong Kong, Hong Kong, China	26	1	University of Hong Kong, Hong Kong, China	363
2	Chinese University of Hong Kong, Hong Kong, China	11	2	Chinese University of Hong Kong, Hong Kong, China	166
3	Griffith University, Australia*	7	3	National Taiwan Normal University, Taiwan (ROC)	109
3	National Taipei University of Nursing and Health Sciences, Taiwan (ROC)	7	4	National Taipei University of Nursing and Health Sciences, Taiwan (ROC)	108
5	Chang Gung University, Taiwan (ROC)	6	5	Chang Gung University, Taiwan (ROC)	91
5	University of British Columbia, Canada*	6	6	Chinese Culture University, Taiwan (ROC)	91
7	Beijing Normal University, China	5	7	Peking University, China	73
7	National Taiwan Normal University, Taiwan (ROC)	5	8	University of British Columbia, Canada*	50
7	Republic Polytechnic, Singapore	5	9	Chung-Ang University, South Korea	38
			10	Griffith University, Australia*	35

Note: Institutions with * are non-Asian

Figure 4

Institutional Collaboration Network in Continuing Education Research in Asia



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Influential Authors and Research Community

The analysis of influential authors and the research community in CE in Asia revealed a diverse and dynamic landscape of scholars from various institutions and countries. This diversity is reflected in the geographical representation of authors, including researchers from Australia, Singapore, China, Taiwan (ROC), the UK, and the USA (see Table 3). Furthermore, institutional diversity is evident, with authors representing various organizations, including universities, polytechnics, and hospitals.

The author's network map provides a visual representation of the research community's structure and evolution (see Figure 5). It reveals distinct clusters that appear to represent different generations of researchers. Interestingly, the map shows limited collaboration between these generational clusters. The older, more established researchers and the newer entrants to the field tend to form separate clusters with minimal interconnection. The collaboration network identifies a well-established group of researchers, represented by the largest cluster led by authors such as Jung I., Latchem C., and Ryan Y. However, the average publication year for this group falls between 2010 and 2015, suggesting a potential decline in their recent activity.

On the other hand, the map also reveals a significant influx of new researchers in the field of continuing education in Asia, particularly post-2016, as evidenced by the presence of yellow nodes comprising nearly half of the map.

Table 3

Top 10 Authors in Continuing Education Research in Asia by Citation Count

No	Author	**Affiliation, Country**	Number of Citations
1	York, Diane	Freelance Author, Richmond, the USA	115
2	Tarrant, Marie	University of Hong Kong, China	113
3	Chen, I-Ju	National Yang-Ming University, Taiwan (ROC)	106
4	Yu, Shu	National Yang-Ming University, Taiwan (ROC)	106
5	Wang, Shu-Ming	National Taiwan Normal University, Taiwan (ROC)	91
6	Chang, Kuo-En	National Taiwan Normal University, Taiwan (ROC)	87
7	Hou, Huei-Tse	National Taiwan University of Science and Technology, Taiwan (ROC)	87
8	Lin, Peng-Chun	National Taiwan Normal University, Taiwan (ROC)	87
9	Hennessy, Deborah	University of Birmingham, the UK	77
10	Hicks, Carolyn	University of Birmingham, the UK	77

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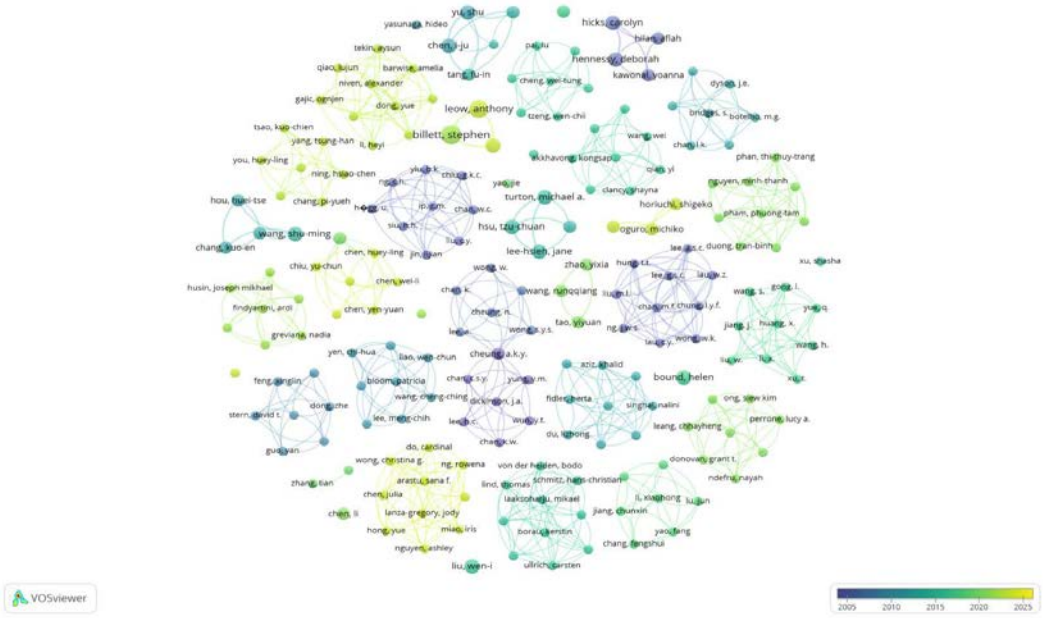
Figure 5
Author Collaboration Network in Continuing Education Research in Asia



Primary Sources and Influential Documents

The examination of primary sources and influential documents in continuing education research in Asia revealed a landscape dominated by healthcare-related publications, particularly in nursing education (see Table 4). The Journal of Continuing Education in Nursing and Nurse Education Today leads in document count (18 publications), while Nurse Education Today tops the citation list with 538 citations. However, the presence of journals like the International Journal of Lifelong Education and Adult Education Quarterly indicates a broader scope encompassing general adult education principles.

When examining the most influential documents, the healthcare focus persists, with nine out of the top ten cited papers relating to medical or nursing education (see Table 5). The most cited paper, "Medical tourism: The trend toward outsourcing medical procedures to foreign countries" (115 citations), reflects the field's engagement with broader healthcare trends. Despite the healthcare dominance, the topics covered are diverse, ranging from e-learning adoption and disaster preparedness to spirituality in healthcare and the impact of COVID-19 on continuing education. Many studies focus on specific Asian countries or regions, providing valuable insights into contextual factors affecting continuing education across different parts of Asia.

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Table 4

Top Sources for Continuing Education Research in Asia by Number of Documents and Citations

Rank	Source	Scope	Number of Documents	Rank	Source	Scope	Number of Citations
1	Journal of Continuing Education in Nursing	Nurse Education, Continuing Education	18	1	Nurse Education Today	Nurse Education	538
2	Nurse Education Today	Nurse Education	16	2	Journal of Continuing Education In Nursing	Nurse Education, Continuing Education	196
3	International Journal of Lifelong Education	Adult Education	12	3	Journal of Continuing Education in The Health Professions	Medical Education, Continuing Education	127
4	BMC Medical Education	Medical Education	11	4	European Journal of Dental Education	Dental Education	118
5	Human Resources for Health	Healthcare Professional Development	6	5	Adult Education Quarterly	Adult Education	100
6	Medical Teacher	Medical Education	6	6	Human Resources for Health	Healthcare Professional Development	97
7	Nurse Education in Practice	Nurse Education	6	7	International Journal of Lifelong Education	Adult Education	92
8	Adult Education Quarterly	Adult Education	5	8	Medical Teacher	Medical Education	87
9	International Information and Library Review	Information and Library Sciences	5	9	Computers and Education	Education, Education Technology	87
				10	Medical Education	Medical Education	57

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Table 5

Top 10 Most Cited Documents in Continuing Education Research in Asia

No	Title	Keyword	Year	Author	Source	Number of citation
1	Medical tourism: The trend toward outsourcing medical procedures to foreign countries	Accreditation; Certification; Continuing medical education; Health care; Medical tourism	2008	York D.	Journal of Continuing Education in the Health Professions	115
2	Analyzing knowledge dimensions and cognitive process of a project-based online discussion instructional activity using Facebook in an adult and continuing education course	Adult learning; Computer-mediated communication; Cooperative/collaborative learning	2013	Lin P.-C.; Hou H.-T.; Wang S.-M.; Chang K.-E.	Computers and Education	87
3	The frequency of item writing flaws in multiple-choice questions used in high stakes nursing assessments	Assessment; Examination; Item-writing flaws; Multiple-choice questions	2006	Tarrant M.; Knierim A.; Hayes S.K.; Ware J.	Nurse Education Today	76
4	Readiness of hospital nurses for disaster responses in Taiwan: A cross-sectional study	Continuing education; Disaster; Nurses; Nursing education and readiness	2016	Tzeng W.-C.; Feng H.-P.; Cheng W.-T.; Lin C.-H.; Chiang L.-C.; Pai L.; Lee C.-L.	Nurse Education Today	67
5	A feasibility study on the adoption of e-learning for public health nurse continuing education in Taiwan	Continuing education; E-learning; Public health nurses; Web-based learning	2007	Yu S.; Chen I.-J.; Yang K.-F.; Wang T.-F.; Yen L.-L.	Nurse Education Today	66
6	Exploring the roles of interaction and flow in explaining nurses' e-learning acceptance	Flow; Interaction; Nurses' e-learning acceptance	2013	Cheng Y.-M.	Nurse Education Today	61
7	Effects of a spirituality training program on the spiritual and psychosocial well-being of hospital middle manager nurses in Korea	Not available	2011	Yong J.; Kim J.; Park J.; Seo I.; Swinton J.	Journal of Continuing Education in Nursing	56
8	Impact of COVID-19 epidemic on live online dental continuing education	COVID-19; dental education; distance learning; epidemics	2020	Liu X.; Zhou J.; Chen L.; Yang Y.; Tan J.	European Journal of Dental Education	54

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9	Evaluation of a nurse-led dementia education and knowledge translation programme in primary care: A cluster randomized controlled trial	Dementia education; Health professionals; Knowledge translation; Primary dementia care	2017	Wang Y.; Xiao L.D.; Ullah S.; He G.-P.; De Bellis A.	Nurse Education Today	54
10	Investigating spiritual care perceptions and practice patterns in Hong Kong nurses: Results of a cluster analysis	Cluster analysis; Hong Kong; Spiritual care	2006	Chan M.F.; Chung L.Y.F.; Lee A.S.C.; Wong W.K.; Lee G.S.C.; Lau C.Y.; Lau W.Z.; Hung T.T.; Liu M.L.; Ng J.W.S.	Nurse Education Today	53

Themes and Emerge Topics

The analysis of themes and emerging topics in continuing education research in Asia, based on a co-occurrence keyword analysis, revealed a rapidly evolving field with several prominent trends.

As expected, "continuing education" emerged as the most frequent keyword, with 55 occurrences (see Table 6), confirming the core focus of the research. The keywords "lifelong learning", and "professional development," both with 15 occurrences, and "adult learning and education" (12 occurrences) underscore the field's emphasis and nature of ongoing education throughout one's career. Interestingly, "China" (20 occurrences) and "Hong Kong" (11 occurrences) feature prominently among the top keywords, corroborating the earlier findings of significant contributions from these regions in the institutional and author analyses.

Table 6

Most Frequently Occurring Keywords in Continuing Education Research in Asia (>7 occurrences)

No	Keyword	Frequency	No	Keyword	Frequency
1	Continuing education	55	10	Evaluation	8
2	China	20	10	Knowledge	8
3	Lifelong learning	15	13	Blended learning	7
3	Professional development	15	13	Distance learning	7
5	Education	13	13	Medical continuing education	7
6	Adult learning and education	12	13	Technology	7
7	Hong Kong	11			
8	Higher education	10			
9	Nurses	9			
10	Dental education	8			

The co-occurrence keyword map (Figure 6) provides valuable insights into the evolving landscape of CE research in Asia, particularly emphasizing emerging trends. The color gradient, representing the average publication year of keywords, reveals a clear temporal progression of research interests.

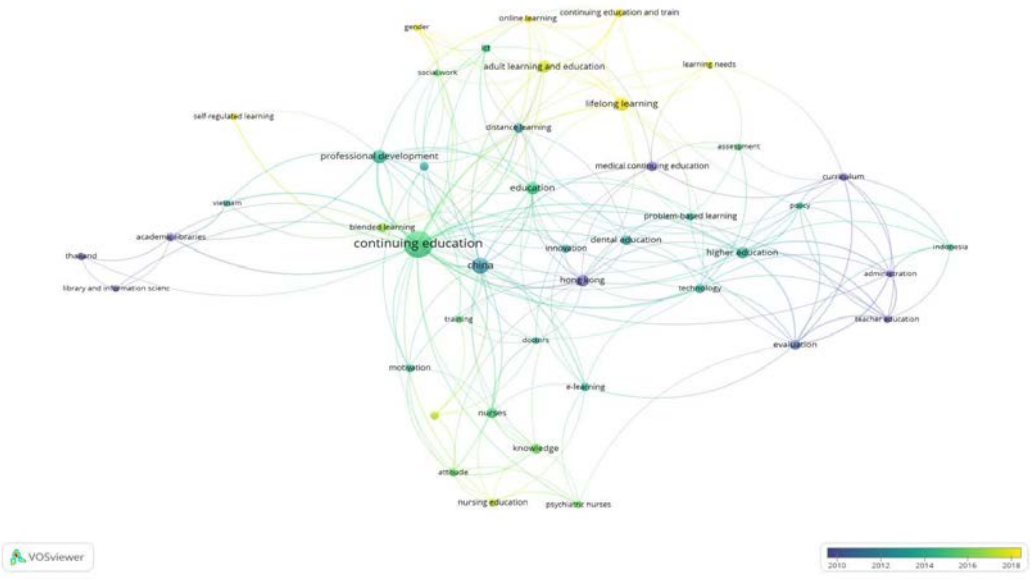
The earlier focus of CE research, represented by purple nodes, centered on foundational aspects of educational systems. Keywords such as "curriculum," "administration," and "evaluation" indicate a primary concern with the traditional topic in Education. As the field developed, evidenced by the green nodes, research interests expanded and diversified. "Professional development" and “problem-based learning” emerged as a significant theme. "Technology" became a prominent keyword, indicating the increasing integration of digital tools and platforms in CE delivery; this keyword is also among the top occurrence keywords list. The presence of "blended learning", with 7 occurrences, further supports this technological trend.

The most recent trends in CE research, depicted by yellow nodes, revealed a significant evolution in focus and approach. "Lifelong learning," despite appearing for a long period, still stands out as a significant concept in the contemporary research landscape, indicating a consistent viewing of CE as an ongoing, career-spanning process. The emergence of "online learning" and "distance learning" (7 occurrences) as prominent keywords underscores the increasing importance of digital and remote education platforms, likely accelerated by global events such as the COVID-19 pandemic. "Self-regulated learning" and “learning needs” appear as a new focus.

Notably, the map reveals a strong focus on healthcare-related continuing education. Keywords such as "nurses," "nursing education," "psychiatric nurses," and "dental education" form a distinct thematic cluster. Moreover, in the list of keywords that have the most occurrences, the healthcare sector's dominance is reflected through the presence of "nurses" (9 occurrences), "dental education" (8 occurrences), and "medical continuing education" (7 occurrences). This reinforces the significant role of healthcare-related continuing education in Asia.

Figure 6

Co-occurrence Keyword Map in Continuing Education Research in Asia



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Discussion

Rapid Growth in CE Research and Room for Development

The significant increase in CE research output since the late 1990s indicates a growing recognition of CE's importance in Asia. This explosion in research activity can be attributed to the rapid advancement of information and communication technologies, particularly the Internet. This technological leap has sparked increased research interest in online and distance learning within CE. Moreover, many Asian countries experienced significant economic growth during this period, fueled demand for a skilled workforce, thereby emphasizing the importance of CE (Ra, 2015). The same pattern of explosion in the number of documents during the late 1990s and early 200s is also observed on several topics, such as e-learning in medical education (Oluwadele et al., 2023) or lifelong learning in the Southeast Asia region (Do et al., 2021).

Regional initiatives and international cooperation have further fueled this research growth. UNESCO's Asia and Pacific Programme of Education for All (APPEAL), implemented in 2001 and involving 21 countries by 2003, has been instrumental in shaping Adult Learning and Education development in the region (UNESCO, 2003). Other contributors include multilateral agencies like the World Bank and Asian Development Bank, and regional organizations such as ASEAN and SAARC. The establishment of the SEAMEO Centre for Lifelong Learning in Vietnam (2013) and the SEAMEO-ASEAN-China Centre cooperation agreement (2013) have opened new avenues for CE research and practice. These collaborative efforts have not only provided resources for CE initiatives but have also created a rich environment for research, contributing to the observed growth in CE-related publications across Asia (Belete et al., 2022). Despite this growth, the fluctuations in output highlight the need for more sustained research efforts in this crucial field.

East Asian Leadership in CE Research and Singapore's SkillsFuture Program

The analysis of country collaboration networks in CE research reveals a complex landscape dominated by a few key players, with emerging trends that reflect both regional strengths and global influences. China, Hong Kong (China), and Taiwan (ROC) emerged as the clear leaders in this field, collectively accounting for over half of the total publications and citations in the dataset. This dominance can be attributed to several factors: substantial research funding, strong emphasis on international publications, and robust higher education systems (Marginson, 2018). Interestingly, the collaboration network also reveals significant involvement of Western countries, particularly Anglo-Saxon nations such as the United States, United Kingdom, and Australia. This presence underscores the global nature of CE research and suggests a flow of knowledge and methodologies between Asia and the West.

Within this network, Singapore emerges as a notable case. Despite not having the largest volume of publications, Singapore occupies a central position in the collaboration network, particularly in recent years. This prominence can be largely attributed to the SkillsFuture initiative, launched in 2015 (Tan, 2017). SkillsFuture is a national movement aimed at promoting lifelong learning and skills development among Singaporeans of all ages, offering features such as learning credits, enhanced internships, and digital skills training. In 2022, over 560,000 Singaporeans had participated in the program (Xuan, 2023). Singapore's comprehensive approach to lifelong learning, integrating education with economic development strategies, presents a compelling model for other countries seeking to enhance their continuing education systems in the context of a rapidly evolving global economy.

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Scattered Clusters in Institutional Collaboration Network

The analysis of institutional collaboration networks in CE research across Asia reveals a landscape characterized by disparate clusters and limited cross-regional cooperation. The network visualization demonstrates a tendency for institutions to form collaborative groups primarily within their own countries or immediate geographical regions. This pattern aligns with observations in other fields of educational research, where geographical proximity often influences collaboration intensity (Kwiek, 2021).

The current state of institutional collaboration in CE research across Asia indicates a need for more initiatives to promote cross-regional and international partnerships. Increased collaboration between institutions from different countries and regions could lead to a more comprehensive and nuanced understanding of CE practices and challenges across diverse Asian contexts (Kuzhabekova et al., 2015). Future efforts to strengthen institutional ties across borders may be crucial for advancing the field of CE research in Asia and fostering innovation in continuing education practices.

Generational Gap in Research Networks

The analysis of author collaboration networks in CE research in Asia reveals interesting patterns that provide insights into the field's structure and evolution. A striking feature of this network is the apparent lack of intergenerational research groups, with limited connections between clusters. This pattern suggests that knowledge transfer between established researchers and newcomers to the field may be limited, potentially hindering the field's development and continuity. Concurrently, there is a significant influx of new researchers in the field, particularly post-2016. However, the limited interaction between these newer researchers and the established scholars raises questions about the transfer of expertise and the field's overall coherence. Further investigation into the causes and implications of this phenomenon could provide valuable insights for improving knowledge transfer and fostering a more integrated research community in CE.

Healthcare Dominance in CE Studies

The bibliometric analysis reveals a prominent role of the healthcare sector in CE research across Asia. This dominance is evident in multiple aspects of the findings, including the institutional affiliations of researchers, the topics of influential documents, and the focus of primary research sources. Several factors contribute to this healthcare-centric focus in CE research. First, the rapid advancements in medical knowledge and technology necessitate continuous learning for healthcare professionals to maintain competence and improve outcomes (Magwenya et al., 2023). Second, many healthcare professions have mandatory CE requirements for license renewal, creating a sustained demand for research in this area (Cervero & Gaines, 2015). Third, the direct impact of healthcare professionals' knowledge on patient safety and care quality drives significant interest and investment in healthcare CE research (Forsetlund et al., 2009).

This healthcare dominance in CE research reflects the sector's critical need for ongoing professional development but also raises questions about potential imbalances in the overall CE research landscape. While healthcare CE research is undoubtedly crucial, the strong focus on this sector may overshadow other important areas of CE, such as technology, business, or education. Future research might benefit from exploring how insights from healthcare CE could be applied to other sectors and investigating potential gaps in CE research for non-healthcare fields in Asia.

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Emerging Digital and Learner-Centered Trends

Recent trends in CE research highlight a significant shift towards technology-enhanced learning. Keywords such as "e-learning," "online learning," and "distance learning" have gained prominence, underscoring the increasing integration of digital tools and platforms in CE delivery. This trend aligns with broader developments in educational technology and the growing demand for flexible learning options (Haleem et al., 2022) An emerging focus on learner-centered approaches is also evident in recent research. Keywords such as "self-regulated learning" and "learning needs" have become more prevalent, suggesting a shift towards more personalized and adaptive CE strategies. This trend reflects a growing recognition of the diverse needs and preferences of adult learners in continuing education contexts (Diep et al., 2019). The healthcare sector's dominance, as noted in previous sections, is also reflected in the keyword map.

These evolving themes and emerging topics indicate that CE research in Asia is responsive to technological advancements, changing workforce demands, and evolving educational paradigms. Future research may benefit from exploring the intersection of these themes, such as investigating the effectiveness of technology-enhanced, learner-centered approaches in various professional contexts, including but not limited to healthcare.

Conclusions and implications

This bibliometric study provides a comprehensive overview of CE research in Asia from 1972 to 2023, revealing a field characterized by rapid growth, regional leadership, and evolving focus areas. The analysis demonstrates a significant surge in research output since the late 1990s, driven by policy initiatives, demographic shifts, and technological advancements. East Asian countries, particularly China, Hong Kong, and Taiwan (ROC) have emerged as leaders in CE research, with substantial contributions from Western collaborators. The study also uncovers several key patterns: institutional collaborations tend to cluster regionally, there's a noticeable generational gap in researcher networks, and the healthcare sector dominates CE research topics. Recent trends indicate a shift towards digital learning approaches and learner-centered methodologies, reflecting the field's responsiveness to technological and pedagogical advancements.

This study has several limitations. It relies on a single database (Scopus), potentially missing publications from other index sources. While bibliometric indicators provide valuable insights, they don't necessarily reflect research quality or impact. Lastly, the quantitative nature of the analysis may overlook important qualitative aspects of CE research in Asia.

However, findings from this study have important implications for CE research and practice in Asia. The regional clustering of institutional collaborations suggests a need for increased cross-border partnerships to enhance knowledge sharing and innovation. The generational gap in researcher networks highlights the importance of mentorship and knowledge transfer initiatives. The healthcare sector's dominance, while crucial, indicates the potential for expanding CE research into other critical sectors. Future research should focus on fostering more diverse collaborations, bridging the generational gap among researchers, and expanding the scope of CE studies beyond healthcare. Additionally, investigating the long-term impacts of emerging digital and learner-centered approaches could provide valuable insights for CE policy and practice across Asia.

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Declaration of Interest

The authors declare no competing interest.

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