

Bibliometric Analysis of Wushu Education: Trends, Themes, and Future Directions

Shuchen Liu¹, Kenny Cheah Soon Lee^{1*}, Syed Kamaruzaman Syed Ali¹

¹ Faculty of Education, Universiti Malaya, Kuala Lumpur, Malaysia

*Corresponding Author: kennycheah@um.edu.my

Received: 21 January 2025 | Accepted: 3 March 2025 | Published: 1 April 2025

DOI: <https://doi.org/10.55057/ajress.2025.7.3.5>

Abstract: *This study used bibliometric analysis to examine trends, themes, and future directions in Wushu education research, emphasizing its evolution from a focus on technical skills to interdisciplinary fields such as pedagogy, cultural communication, and health sciences. The analysis was based on 198 articles published between 2010 and 2024 in the Web of Science database, showing a significant increase in publications and citations since 2016, reflecting increased global recognition. Key themes included the health benefits of Wushu, instructional design, and its role in cultural communication. Nonetheless, the study also identified gaps, such as insufficient research on the interdisciplinary impact of Wushu and limited exploration of its global adaptations, which limit its wider impact. The findings emphasize the potential of Wushu education to address global challenges, promote cross-cultural understanding, and contribute to educational strategies. Future research should focus on interdisciplinary collaboration, cross-cultural studies, and innovative pedagogical applications to maximize the impact of Wushu. Wushu education connects sport, culture, and education, providing transformative opportunities for holistic development and global dialog. This study provides educators, policymakers, and researchers with valuable insights to advocate for the integration of Wushu education into broader educational and cultural frameworks to enhance its global impact.*

Keywords: Bibliometric Analysis, Wushu Education, Research Trends

1. Introduction

1.1 Background of the study

Wushu education is an important part of physical education in China and is one of the outstanding representatives of traditional Chinese culture (Mare, & Paul, 1997). As an important element of China's intangible cultural heritage, it carries rich philosophical thoughts, ethical values and national spirit. In the field of education, Wushu embodies the educational goal of all-round development of morality, intelligence, physical fitness, aesthetics of labor by strengthening students' physical fitness and cultivating their will quality (Zhang, 2020a). In addition, the cultural connotation of Wushu gives it a more far-reaching significance in international educational exchanges and makes it an important way to promote the spread of Chinese cultural soft power (Lu, 2008). Therefore, by analyzing the research trends in Wushu education, this study can help academics and related organizations understand the current state and future direction of Wushu research.

With the rise of globalization and cultural diversity issues, academic research on Wushu continues to heat up. In the past few decades, the research topics of Wushu education have gradually expanded from traditional technical skills to a variety of areas such as cultural communication, mental health, and educational and teaching methods, reflecting its potential for interdisciplinary research (Yang, 2016a). By analyzing the time distribution of published literature, research themes, and author networks, it is possible to present a clear picture of the transformation of Wushu education from a single technical study to a multidisciplinary cross-disciplinary study. At the same time, by identifying milestone studies and key figures in the field, this study helps future scholars to understand the academic core and dissemination pathways in the field of Wushu education.

Bibliometric analysis, as a scientific quantitative research method, can help researchers identify high-frequency keywords and their relational networks in the field of Wushu education, revealing its main directions of development (Donthu et al., 2021). By analyzing the number of publications, citations, and research topics, key scholars and hot topics in the field can be identified. In addition, bibliometric analysis reveals research gaps and possible future growth in the field, planning future research paths for researchers (Smith & Marinova, 2005; Zhou, 2024). By revealing hotspots and trends in global and regional research, this study can help administrators understand the experiences in the development of Wushu education and inform the construction of locally relevant policy measures (Smith & Marinova, 2005).

1.2 Objectives of the study

The primary objective of this study is to reveal publication trends, distribution of key authors and important journals in the field of Wushu education through bibliometric analysis. This study analyzes the changes in the annual publication volume of Wushu education research in recent years and explores the period of research activity in the field. At the same time, it identifies notable core journals in the field, sorting out the topics and disciplines in which they publish (Donthu et al., 2021). This comprehensive analysis demonstrates the historical trajectory of Wushu education and maps the visual network relationships in the field for researchers.

Through thematic analysis and mining of research trends, this study reveals core themes and research gaps in the field of Wushu education that have not been fully explored. Through keyword co-occurrence analysis and clustering techniques, hot topics of academic interest in recent years can be identified (Giannakos et al., 2020). Examples include Wushu and health, instructional design of Wushu programs, and international dissemination of Wushu culture. Meanwhile, by analyzing the time evolution of the themes, the study can reveal which issues have received sustained attention and which areas have experienced a decline in research enthusiasm. In addition, the study will also provide insights into the shortcomings in the field, thus providing a clear direction and basis for future research.

Based on revealing current research trends and gaps, the third goal of this study is to identify the potential and direction of future research in the field of Wushu education. With increasing emphasis on youth physical fitness and traditional culture preservation in China, the prospects for the application of Wushu education are becoming more and more open (Ji & Zhang, 2020; Liu, 2021a). Future research could explore the role of Wushu as a bridge in the global dialog on cultural diversity (Lu, 2008). In addition, Wushu education has the potential to address global social issues (e.g., adolescent mental health, health maintenance in aging societies), and these areas will offer more innovative research possibilities for academics.

2. Literature Review

2.1 Overview of Wushu Education Research

The development of Wushu education reflects a gradual evolution from practical experience to academic theory. In the early days, Wushu education centered on technical training, emphasizing the teaching of skills and the cultivation of practical combat ability (Song et al., 2021). Research at this stage was dominated by empirical summaries and lacked systematic theoretical support. With the improvement of the modern education system, Wushu was gradually incorporated into the school physical education curriculum and became an important part of physical education (Yi & Pang, 2004; Zhao & Nie, 2012). In the 21st century, Wushu education began to receive extensive attention from academics, and the scope of research was gradually extended to the fields of pedagogy, sociology and cultural studies (Yang, 2016a). In recent years, the process of disciplining Wushu education has accelerated with the rise of interdisciplinary research. This evolution from practice to theory reflects the process of academic development of Wushu education and establishes a solid foundation for the subsequent construction of specialized disciplines.

Research themes in Wushu education in the Chinese context can be categorized into three main dimensions: pedagogy, cultural significance, and physical benefits (Yang, 2016a). In the area of pedagogy, researchers have focused on Wushu curriculum design, teaching methods, and assessment of student learning outcomes (Luo, 2004). In the area of cultural significance, Wushu education is regarded as an important means of passing on traditional Chinese culture, and related studies have focused on the ethical values, spiritual connotations, and its role in cross-cultural communication (Cai, 2007). In addition, physical benefits are also one of the core themes of the research, and the findings show that Wushu has a significant effect on enhancing students' heart and lung function, flexibility and core strength. Meanwhile, it improves students' mental health and social adaptability (Lv, 2016). These multidimensional studies reveal the comprehensive value of Wushu education and provide rich academic support to promote its theoretical development and practical application.

2.2 Research Methods of Wushu Education

The research methods of Wushu education mainly include three categories: qualitative research, quantitative research and mixed methods, each with its own characteristics and areas of application. Qualitative research usually explores the cultural connotation, educational value and teaching practice of Wushu education through interviews, observations and textual analysis (Kate, 2012). Quantitative research focuses on verifying the effects of Wushu education on students' physical fitness, mental health and learning outcomes through experimental design and statistical analysis (Creswell, 2012). When studying cross-cultural communication in Wushu education, a mixed methods approach combines the strengths of both qualitative and quantitative approaches. Quantitative research allows for the analysis of actual participation rates in different countries around the globe, and utilizing qualitative scientific methods allows for the interpretation of specific challenges in cross-cultural adaptation (Liang et al., 2024). Together, these three approaches form the basis of Wushu education research and provide important scientific tools for exploring its multifaceted value.

Despite methodological advances in Wushu education research, significant gaps in methodological diversity remain, limiting the depth and breadth of research. Currently, most research focuses on the application of a single methodology, especially quantitative research, which is widely used because of its advantages in measuring specific effects (Creswell, 2003). However, this tendency may have neglected a comprehensive exploration of the deeper cultural

and social meanings in Wushu education (Brett & Andrew, 2016). Although qualitative studies can reveal the implicit cultural meanings in Wushu teaching, their small sample sizes make it difficult to generalize them to a wider audience (Maxwell, 2013). In addition, the application of mixed methods is still in its preliminary stage, and many studies fail to fully combine the strengths of qualitative and quantitative analysis, resulting in a lack of in-depth understanding of the complexity of the research object (Plano Clark & Ivankova, 2018). Therefore, future research on Wushu education needs to adopt more strategies of multi-method integration to enhance the scientific nature of the research from an interdisciplinary perspective.

2.3 Bibliometric research in the field of sports and education

Bibliometric analysis is a quantitative research method that reveals the development trend, research hotspots and academic networks in the field of research mainly by statistics and analyzing data from academic publications (Donthu et al., 2021). This method is based on the systematic analysis of indicators such as the number of documents, authors, keywords and citation relationships, which can provide a clear academic map (Heersmink et al., 2011). In recent years, with the development of big data and visualization technology, the application scope of bibliometric analysis has been expanding, and it has become an effective tool for revealing complex academic systems (Arruda et al., 2022).

In the field of education, bibliometric analysis has been widely used to explore research trends and academic impact (Yanar & Avcı, 2023). Previous scholars have explored topics such as teachers' work engagement and students' learning outcomes through bibliometric analyses, clarifying the distribution of highly productive authors and high-impact journals (Hallinger & Kulophas, 2020). They reveal the current pattern of academic development in the field of education and provide specific reference directions for subsequent research. Thus, these studies demonstrate the strong applicability and popularization value of bibliometric methods in different disciplinary contexts (Garner et al., 2017).

3. Methodology

Bibliometric analysis can demonstrate three aspects. First, by analyzing the time trend of literature production, it can demonstrate the development trajectory of the research field (Garner et al., 2017). Second, by analyzing the co-occurrence of keywords, it is used to identify core research themes and hotspots (Giannakos et al., 2020). Finally, through citation network and collaboration network analysis, it can explore the academic influence and knowledge flow path of well-known scholars (Feng et al., 2022). With the help of modern analytical tools (VOSviewer), the researcher transforms complex data into visual graphical forms, thus demonstrating more directly the knowledge structure and dynamic changes of the discipline (Arruda et al., 2022). Bibliometric analysis can reveal the strengths and weaknesses of research and predict the future direction of the research field (Garner et al., 2017).

3.1 Data Collection

In order to ensure the scientific validity of the research data, Web of Science was chosen as the main data source for this study. This database covers a wide range of academic fields and is known for its high quality and authority (Birkle et al., 2020). To accurately retrieve the literature related to Wushu education, this study chose "Wushu Education" and "Chinese Wushu Education" as the search terms, through employing the search phrases "Wushu Education*" or "Chinese Wushu Education*" for data collection.

To ensure the scientific validity and applicability of the data, strict inclusion and exclusion criteria were set for this study. The inclusion criteria consisted of (1) The research topic was closely related to Wushu education. (2) The type of literature was Proceeding Paper, Article, Review Article, and Early Access. (3) Publication was limited to the past 15 years to ensure that the results of the study reflected the latest trends. Exclusion criteria were: (1) Non-English language articles. (2) Document types including Retracted Publication, Meeting Abstract, Letter, and Book Chapters. and (3) Documents prior to 2009. Through the strict screening of these criteria, the scientificity and relevance of the data could be ensured to the greatest extent possible. Finally, a total of 198 articles met the criteria and were included in the bibliometric analysis.

4. Results and Analysis

4.1 Publication Trends

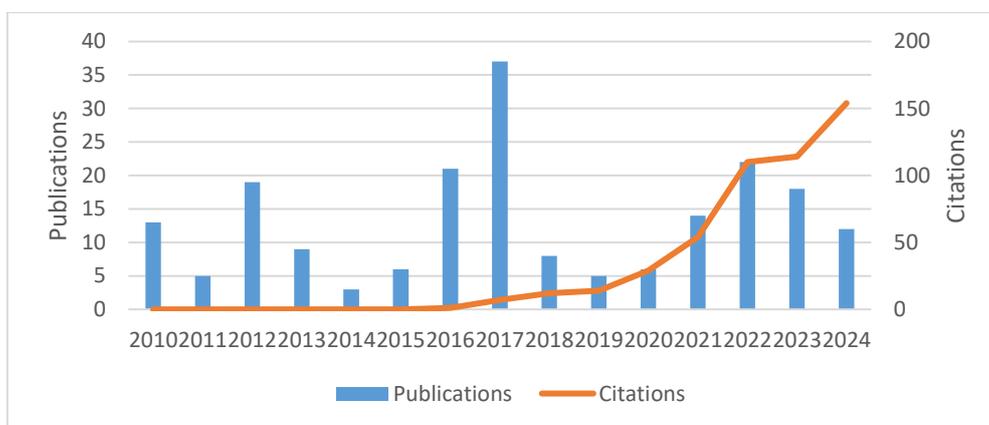


Figure 1: Wushu Education Annual Publications and Citation Trends.

As shown in Figure 1, from 2010 to 2015, the average number of citations each year was 0. From 2016 to 2017, the number of papers published started to increase geometrically, more than the total number of publications in the previous 5 years. From 2018 to 2020, the number of papers published once again decreased to less than 10 per year. However, since 2016, the number of citations of papers in this field is increasing every year. From 2021 to 2024, the number of papers published is averaging at 15 per year and citations have remained above 110 times per year for the last three years as well.

4.2 Influential Authors

The search results show that 65 authors in WOSCC have made efforts to research the Wushu education. We selected the top three authors according to the number of their publications and arranged them from high to low (Table 1). The top three authors are Liu, Ying (n=7), Wang, Lin (n=6), Ma, Xiujie (n=5) and they are all from China. Their H-Index also decreases gradually in that order. However, the TC of the second ranked author is the highest among the three.

Table 1: The Top 3 Authors Who Promote Wushu Education

Ranking	Author	Country/Region	Articles	H-Index	TC
1st	Liu, Ying	China	7	4	41
2nd	Wang, Lin	China	6	3	111
3rd	Ma, Xiujie	China	5	3	18

TC = Total Citations.

4.4 Collaborative Network of Authors



Figure 3: The Authors' Collaboration Network in Wushu Education

Subsequently, we analyzed the collaborative relationships between research authors who co-authored articles in this field. As shown in Figure 3, among the 11 authors, only one author is from the UK, and all other authors are from China. Meanwhile, the cooperation between authors is not very close, and all of them focus on their own group research. Combined with the data in Table 1, it can be found that the authors with the largest number of publications are actively cooperating and bringing Wushu education into the international platform.

5. Discussion

5.1 Key Findings

Based on the bibliometric analysis, publication trends and citations in the field of Wushu education show significant changes. From 2010 to 2015, the number of publications related to Wushu education was relatively stable, but the number of citations was low, with an average of 0 citations per year. This suggests that during this time period, although there was continuous research being conducted, the impact and recognition of these studies was low. However, from 2016 to 2017, the number of publications began to increase exponentially, totaling more than the previous five years combined. During the same period, the number of citations also began to increase every year, showing that research in this field is gradually gaining attention and recognition.

From 2018 to 2020, although the annual number of articles has decreased, remaining at a level of no more than 10 per year, the number of citations continues to grow, indicating that even with the decrease in quantity, the quality and impact of published research is still improving. From 2021 to 2024, the number of publications stabilizes at about 15 per year, while citations remain above 110 per year in these three years, showing that research results in the field of Wushu education are gradually becoming more widely recognized and applied by the international academic community (Lu, 2008).

With regard to the implications for future trends, these data indicate that Wushu education is transforming from a more closed research field to a more open and internationalized research topic (Liu, 2021b). As more and more high-quality research is published and cited, Wushu education is gradually being emphasized for its pedagogical approaches, cultural values and its role in global health and physical education (An, 2020).

While analyzing these trends, we found several influential authors who have significantly contributed to these changes. For example, Liu Ying, Wang Lin, and Ma Xiujie, whose research has contributed to the shift in Wushu education from traditional skill transfer to broader educational and cultural exploration (Xiujie et al., 2022). Liu Ying's articles have been cited

an average of 41 times, demonstrating the depth and breadth of her research. Wang Lin's articles, although few in number, have totaled 111 citations due to the discussion of some foundational studies. Ma Xiujie, in contrast, focused on specific Wushu education practices or theoretical analyses.

In addition, the analysis of research themes reveals that Wushu and health, the design of Wushu teaching, and the international dissemination of Wushu culture have become hot issues in recent years (Liang et al., 2024; Liu, 2022; Qiao & Zhu, 2020; Zhang, 2020b). These themes demonstrate the diversity of current research in Wushu education and illustrate the important role of Wushu education in globalized education and cultural exchange (Liu, 2021a). The analysis of these trends and themes can help researchers to better understand the past and current situation in the field of Wushu education and provide valuable reference value for future research directions and educational practices.

5.2 Implications for Wushu Education

Trends and research findings in Wushu education provide insights for educators, policy makers, and researchers and generate specific references for their responsibilities and work directions.

First, for the community of educators, the results of the research reveal key elements of Wushu education efforts.

- a. Integration of Curriculum Design. Integrate moral and philosophical perspectives into the Wushu curriculum. For example, teaching virtue (the ethical code of Wushu) in order to develop a sense of responsibility and respect for others values in students.
- b. Focus on holistic education. Utilize Wushu education to promote students' holistic development, including physical health, mental balance, and social skills.

Second, policymakers can use research trends and results to guide the development of educational and cultural policies.

- a. Support Wushu education programs. Provide financial and resource support, such as teacher training, facility construction, and curriculum development, to promote the popularization and quality enhancement of Wushu education.
- b. Develop a comprehensive development strategy. Formulate a long-term development strategy for Wushu education and utilize the cultural attributes of Wushu to enhance the country's soft power and cultural influence.

Finally, researchers should focus on the under-explored areas of Wushu education and study them from a multidisciplinary perspective.

- a. In-depth study of the interdisciplinary effects of Wushu. Explore the specific mechanisms and effects of Wushu in improving students' cognitive functioning, mental health, and social skills, and how Wushu can be used as an educational tool to help address challenges in modern education.
- b. International comparative studies. Conduct international comparative studies to analyze the adaptation and effectiveness of Wushu education in different cultures and educational systems, thus providing a scientific foundation for its global promotion.
- c. Interdisciplinary Collaboration. To conduct in-depth cooperation with experts in the fields of psychology, education, and sociology to study the potential application of Wushu education in different fields, especially its role in global health and cultural exchanges.

5.3 Limitations of the Study

5.3.1 Limitations of Data Sources

Web of Science (WoS) was chosen as the primary data source for this study instead of other possible databases such as Scopus. The main reason for choosing WoS is that it is widely

regarded as one of the most authoritative and formalized data sources for academic research, especially in terms of citation analysis and scholarly evaluation (Birkle et al., 2020). The literature provided by WoS is usually rigorously peer-reviewed, which ensures the quality and reliability of the research (Birkle et al., 2020). However, WoS covers a smaller number of journals relative to Scopus, and in particular may not be as comprehensive as Scopus in terms of publications from certain specific regions or languages. Therefore, relying on WoS may lead to the ignoring of certain important regional studies or relevant literature in emerging journals, thus affecting the comprehensiveness of the study.

5.3.2 Limitations of Keywords

During the data collection process, relevant literature was retrieved by setting specific search terms (e.g., “Wushu Education” and “Chinese Wushu Education”). While this approach can be efficient in targeting research areas, it may also lead to the exclusion of some marginal but relevant studies. For example, some studies may have used terms such as “martial arts” or “kung fu” more than “Wushu”, and these studies were not included in the analysis because of the keyword mismatch. These studies were not included in the analysis due to keyword mismatch. In addition, the choice of keywords may not have covered all subfields or emerging issues in Wushu education, thus affecting the completeness of the findings.

5.3.3 Limitations of Geography and Language

Despite the fact that WoS is an international database, there may still be geographical and linguistic biases in the literature it includes. For example, English language literature is over-represented, while important research from non-English speaking regions may not be adequately reflected. This bias leads the researcher to overlook research findings from certain regions, thus limiting the understanding and evaluation of the diversity of Wushu education globally.

6. Future Research Directions

6.1 Cultural Communication and Intercultural Exchange

Wushu, as an important part of Chinese culture, has shown a significant growth trend in its cultural dissemination around the world (Liu, 2022). Future research should delve into how Wushu serves as a soft power to promote cultural understanding and cultural diplomacy (Xiujie et al., 2022). Research could focus on how Wushu is instructed in different cultural contexts, its acceptance and its specific role in promoting cross-cultural understanding. In addition, it could explore how Wushu education can help build a global identity, especially in multicultural environments.

6.2 Wushu and Physical and Mental Health

Based on the results of the thematic analysis, the relationship between Wushu and health is a hot topic in current research (Zhang, 2020b). Future research should continue to explore the effects of Wushu training on an individual's physical health, including the improvement of heart and lung function, flexibility and core strength. Meanwhile, considering the general concern for mental health in modern society, research should provide a deeper understanding of how Wushu affects mental health in areas such as stress reduction, boosting self-confidence and improving emotional management.

6.3 Education Strategy and Policy Development

Given that Wushu education has been shown to be beneficial to student development in a number of ways (Yang, 2016b), future research should focus on how educational policies can

better integrate Wushu education. Research could explore specific educational strategies, such as the design of Wushu curricula, the allocation of educational resources, and methods of evaluating educational effectiveness. Policy research should also focus on how to promote Wushu education nationally and globally, and how to reasonably position the value and function of Wushu education in the education system.

7. Conclusion

This study systematically analyzes the field of Wushu education through bibliometric methods, aiming to reveal the trends, core research themes, and academic impact of the field. The findings of the study indicate that Wushu education involves multiple dimensions such as culture, education, and mental health. Publication and citation data in the field show that research on Wushu education has shown significant growth from 2010 to 2024 and has made important gains in international recognition and academic impact. In addition, through keyword and theme analysis, this study identifies topical issues in Wushu education research, such as Wushu and health, educational strategies, and cultural communication.

The contributions of this study to the field of Wushu education are mainly reflected in the following three aspects. a. Provides a trajectory of the development of Wushu education research. Through quantitative literature analysis, the historical development and future trends of Wushu education research are clarified, providing research directions and references for scholars and practitioners. b. Enhanced understanding of the multidimensional value of Wushu education. By analyzing the links between Wushu education and physical health, psychological perfection and cultural identity, this study highlights the disciplinary importance of Wushu education in modern society. c. Suggestions are made to promote international exchange and cooperation. Based on the geographical constraints that exist in the current study of Wushu education, strategies to enhance international cooperation and cultural exchange are proposed, and it is suggested that Wushu education should be developed in the direction of globalization and multicultural integration.

Given the unique educational value and cultural significance of Wushu education, this study calls for continued academic attention to the development of Wushu education. Wushu education crosses the boundaries of sport, culture and education fields, and its study should not be limited to the traditional transfer of skills but should be more broadly explored in terms of its role in promoting holistic development of the individual, cultural exchange and international understanding. Therefore, researchers are advocated to conduct more collaborative and interdisciplinary studies to fully explore and utilize the potential of Wushu education in the global education system. Through these efforts, we can better understand and promote the modern application of Wushu education as a bridge for global education and dialogue on cultural diversity.

Acknowledgement

The author would like to thank the University Malaya for providing the supports for this study.

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