



Current Status and Development Trend of Research on Performance Assessment Related to Middle Schools Based on the Wanfang Database

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Abstract: Based on the research literature on performance assessment in the Wanfang database, a bibliometric analysis was conducted to understand the current status and development trend of performance assessment research related to secondary schools in China. The search time frame was for relevant literature until December 31, 2020, and the extracts included information such as the names of authors, units, publication dates, and keywords of relevant studies. The hotspot analysis and cluster analysis of high-frequency keywords were mainly done using VOSviewer 1.6.17 software, and visual density maps and cluster maps were generated simultaneously. A total of 359 articles were included in this literature. Secondary school-related performance assessment research began in 1997, and the literature volume has tended to increase each year, peaking in 2020 (57 papers). However, fewer productive authors and collaboration between authors and institutions were lacking. 359 studies had 1242 keywords, and only 22 (3.37%) appeared more than five times. A total of 6 clusters were formed among the keywords. There were seven emerging keywords: experimental teaching, key competencies, geographic practice, high school geography, Junior high school Chinese, experimental teaching, and writing. The research area of domestic performance assessment is extensive and is growing rapidly, and the cooperation between authors and institutions should be strengthened in the future.

Keywords: Performance assessment, Bibliometric, VOSviewer, Middle school.

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INTRODUCTION

The reform of student evaluation should adhere to morality-oriented, ability-oriented, comprehensive development, and oriented to everyone, and should strengthen the process evaluation and improve the comprehensive quality evaluation system (Zhang Jiajun, 2021). Based on the requirements of the overall development of key competencies and comprehensive quality, teaching evaluation should emphasize the examination of

practical problem-solving ability (Zhao Fuxue *et al.*, 2018). Currently, assessments that point to higher-order thinking focus on many significant international educational quality assessment programs (Sun Hongzhi *et al.*, 2021). The traditional educational assessment focuses on supervision, differentiation, and the selection and is only superficial, partial, and at the moment, while core literacy-oriented classroom teaching calls for more scientific and comprehensive assessment (Zhao

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Jinlong, 2021). Among the various assessment methods, researchers have found that performance assessment focuses on practical aspects and problem-solving skills, and it evaluates individuals by completing tasks of a certain authenticity (Li Wenjing *et al.*, 2010).

Performance assessment has been actively piloted and promoted in China in recent years and has received widespread attention. However, the research themes, research hotspots, and development trends in this area are still unclear, so this study uses bibliometric analysis to explore the current status of performance assessment research related to secondary schools in China and then provide a reference for conducting related research.

DATA AND METHODS

Data Sources

A computer search of the Wanfang literature database was used to search for relevant literature up to December 31, 2020. Search for the subject term "performance assessment" and include "middle school", or "high school", or "junior high school". The literature was exported using the export function of the Wanfang database, and the export file contains the names of authors, research institutions, publication dates, keywords, and other relevant information of the included studies.

Inclusion and Exclusion

Inclusion Criteria

- i. Published Chinese literature on performance assessment related to secondary schools
- ii. The type of literature was "journal" articles.

Exclusion Criteria

- i. Conference papers, newspapers, yearbooks, patents, standards
- ii. Literature on research topics unrelated to

- performance assessment in secondary schools
- iii. Repeated studies.

Statistical and Knowledge Mapping Analysis

This paper uses VOSviewer 1.6.17 software for statistical and mapping data analysis based on bibliometric and text mining methods. Hotspot analysis and clustering analysis of high-frequency keywords were performed to generate visual density and clustering maps. In the density visualization map, the increasing frequency of keyword co-occurrence is indicated from cold colors (blue) to warm colors (red), i.e., the increasing hotness of the research topic (Gao Yunfeng *et al.*, 2018). The network map consists of nodes and connecting lines. The nodes represent keywords, and their size reflects the number of studies or the frequency of elements appearing. A larger node indicates a higher number or frequency of studies (Xie Dairong, 2021). The thickness of the lines between the nodes represents the degree of association of each keyword or topic. The colors of the nodes and lines represent different clusters or years (Ling Juan *et al.*, 2020). In VOSviewer, the counting method for this study was set to "fractional counting", and the software ignored literature with more than 25 authors by default.

RESULTS

Temporal Distribution of the Literature

The first research literature on performance assessment related to secondary schools appeared in 1997. Before 2009, the publication number of performance assessment related to secondary schools did not exceed 10 per year. From 2010-2014, the publication number did not exceed 30 per year. However, from 2016 onwards, the literature grew rapidly, with a peak of literature published in 2020 (57 articles) (Figure 1).

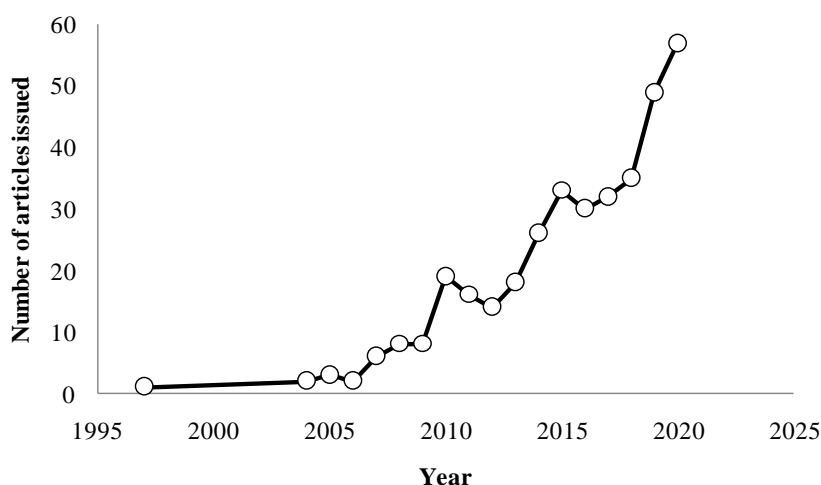


Figure 1: Trends in the Number of Performance Assessment Studies Related to Secondary Schools over Time

The Author

A total of 435 authors participated in the 359 research papers, and the authors with the highest volume of publications were Pan Huaqing (4

articles), Chen Min, Du Xunjie, Liu Bingzhu, Liu Fei, and Tong Lime with three articles each, while the remaining authors had no more than two publications (Figure 2).

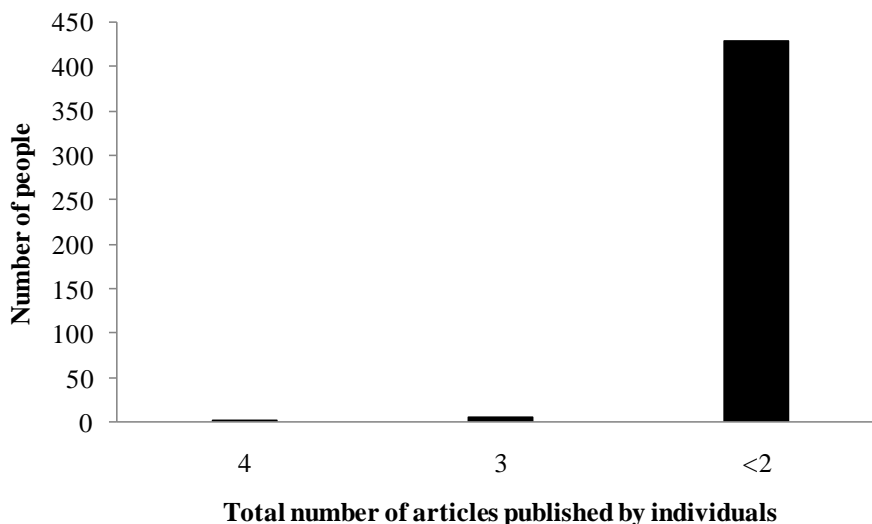


Figure 2: Number of Articles by Authors of Performance Assessment Studies

Research Institutions

The 435 authors came from 467 research institutions respectively and were mainly from universities and colleges, of which 233 (49.89%) research institutions participated in the publication

of 1 article. The institution with the highest number of publications was East China Normal University, with 22 publications (4.71%). There were nine institutions with more than five publications, accounting for 18.42% (Table 1).

Table 1: Research Institutions With More Than Five Articles in Performance Assessment Studies

Research institution	Number of articles issued	Percentage (%)
East China Normal University	22	4.71
South China Normal University,	14	3.00
Central China Normal University	9	1.93
Shandong Normal University	9	1.93
Beijing Normal University	7	1.50
Xishan Senior High School, Jiangsu Province	7	1.50
Southwest University	7	1.50
Nanjing Normal University	6	1.28
Shuangliu Middle School, Sichuan Province	5	1.07

Keywords

Among the 359 performance assessment studies with 1242 keywords, only 22 (3.37%) appeared more than five times, among which the most frequent was "performance assessment" (213, 17.15%), followed by "key competencies" (18, 1.45%), "application" (17, 1.37%), and "evaluation"

(15, 1.21%) (Table 2). The density map of keywords with more than five articles shows that the main keywords are "performance assessment", "key competencies", "application", "evaluation", "junior high school mathematics", "evaluation standards", "experimental teaching," and "high school English" (Figure 3).

Table 2: The Top 10 Keywords in Terms of Frequency

Research institution	Number of articles issued	Percentage (%)
performance assessment	213	17.15
key competencies	18	1.45
application	17	1.37
evaluation	15	1.21
junior high school mathematics	14	1.27
evaluation standards	13	1.05
experimental teaching	11	0.89
high school English	10	0.81
junior high school biology	9	0.72
Junior high school Chinese	9	0.72

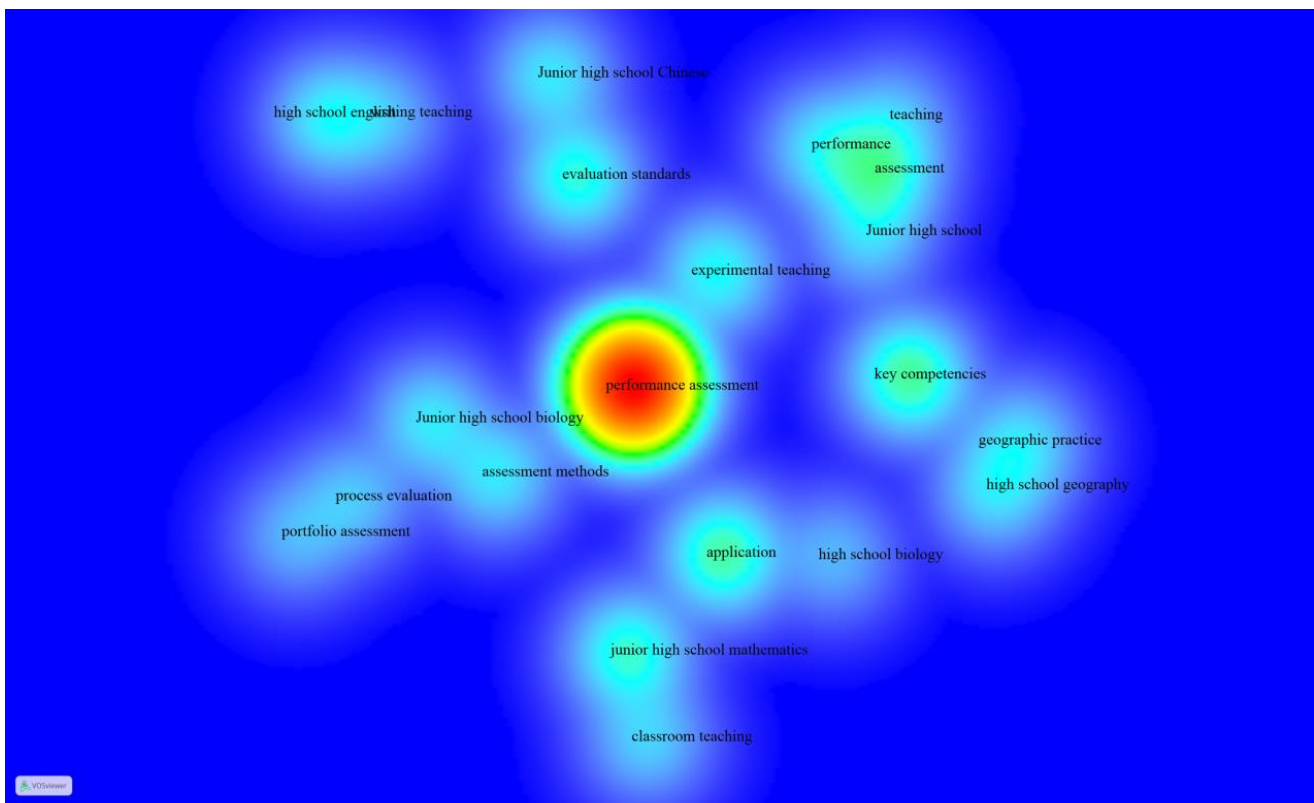


Figure 3: Major Keyword Density Map

Keyword Clustering Analysis

A total of seven categories were formed for keywords with frequencies greater than 5. The first cluster (in red) relates to the keywords: junior high school biology, evaluation methods, process evaluation, and portfolio assessment. The second

clustering (green) involved keywords, such as experimental teaching, middle school, evaluation, teaching, and performance. The third cluster (blue) involves keywords like “application”, “high school biology”, “middle school mathematics”, and “classroom teaching” (Figure 4).

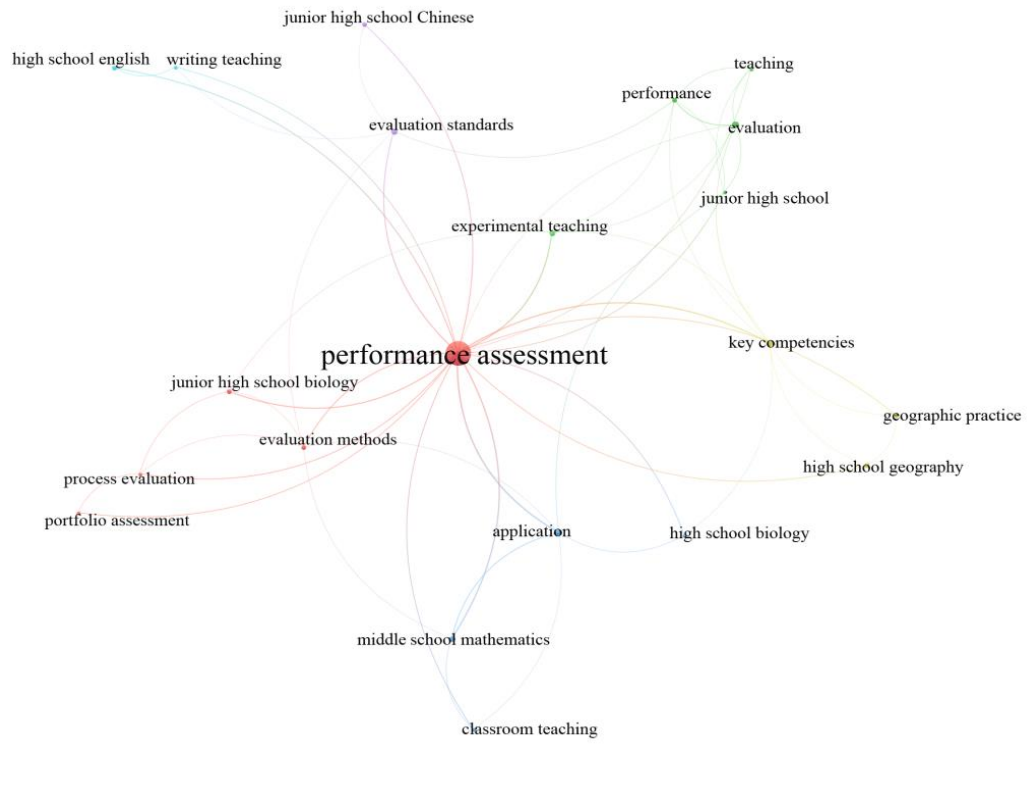


Figure 4: Cluster Analysis Map of Major Keywords

Emerging Keywords

In the visualized time network map, the color of different nodes indicates the year of keyword appearance, and yellow represents the newly appeared keywords in recent years. This study generated a visual temporal network map for

keywords with frequencies greater than 5, indicating that seven were emerging keywords, including junior high school Chinese, experimental teaching, key competencies, geographic practice, high school geography, and writing teaching (Figure 5).

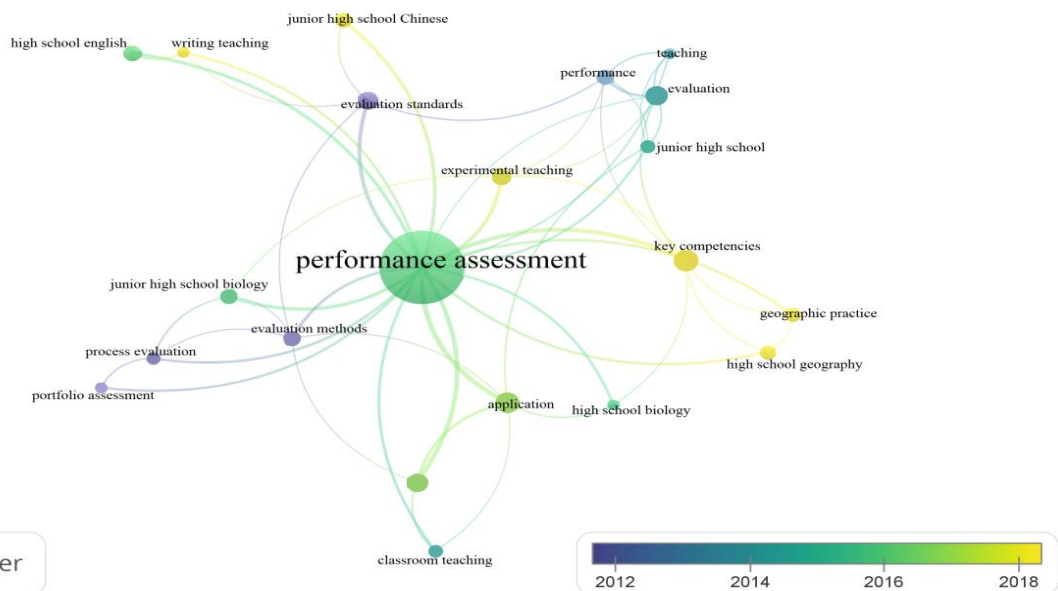


Figure 5: Temporal Network Map of the Main Keywords of the Performance Assessment Studies

CONCLUSION AND DISCUSSION

Based on the bibliometric analysis and using VOSviewer software, this paper explores the trends

in the field of performance assessment research related to middle schools in China for more than 20 years, analyzes the current situation and hot spots of

this research, and also dissects the influence and academic level of different authors and institutions. Overall, the number of articles published on performance evaluation did not exceed 10 per year before 2009, a period of slow development in the field's nascent stage. From 2010 to 2014, the number of articles published per year continued to increase, but still did not exceed 30, a period of growth and development. From 2016 onwards, the volume of performance evaluation literature grew rapidly, a period of rapid growth. Among them, 57 relevant articles were published in 2020, reaching a peak. Therefore, it is speculated that the number of publications is likely to grow significantly in the coming years.

The percentage of authors involved in only one publication was as high as 91.95%, indicating fewer prolific authors of performance assessment studies, implying a relative lack of scholars who have focused on the field for a long time. From the authors and their affiliations, there is a lack of cooperation among researchers and institutions in the field of performance assessment, and there is a need to strengthen cooperation and innovation in this field in the future to promote the emergence of emerging research themes and provide new directions for performance assessment research.

There were 1242 keywords in 359 performance assessment studies, of which 496 (39.93%) and 164 (13.20%) appeared once and twice, respectively. Therefore, on the one hand, it shows that the number of high-frequency keywords is low, and on the other hand, it also indicates that, to a certain extent, the content of performance assessment studies related to middle schools is relatively extensive. The keyword density map shows that the hot spots of domestic research in the field of performance assessment are mainly focused on "performance assessment", "key competencies", "application", "assessment", "junior high school mathematics", "evaluation standards", "experimental teaching", "high school English". Among the keyword clusters, the red cluster focuses on the study of "evaluation methods", "evaluation criteria", and "classroom teaching process"; the green cluster focuses on applying performance assessment, exploring its application in classrooms, such as mathematics and biology; Blue clustering focuses on specific teaching evaluations. These research clusters are interrelated and intersect, and the research directions are constantly transformed, and the breadth and depth of the research content are expanded to some extent. The keywords that

emerged around 2018 are junior high school Chinese, experimental teaching, key competencies, geographic practice, high school geography, writing teaching, which may be the hot spots and trends of future research on performance assessment. Adapting to the requirements of the times and national policies, research on performance assessment has begun to focus on key competencies in recent years.

This article on 359 performance assessment studies shows that the field has been extensively researched and rapidly growing. Next, the collaboration between authors and institutions should be strengthened to facilitate timely information exchange and promote the development of performance evaluation research.

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