Management of action research in school: a bibliometric analysis

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Article Info

ABSTRACT

This paper employs bibliometric analysis and visualization techniques, including VOS Viewer, to scrutinize trends in managing action research in schools. Utilizing a dataset of 337 articles sourced from Web of Science (WoS) until 2023, the study adheres to PRISMA guidelines to systematically examine authorship patterns, trends, and themes. The analysis reveals a surge in publication rates and a focus on collaborative problem-solving, inclusivity, and global perspectives, with notable contributions from journals like educational action research and authors (such as Wood). Diverse author collaborations and global representation underscore interconnected research themes. Additionally, four distinct clusters—knowledge and leadership, action research and engagement, caring and impact, and empowerment and participation—emerge, encapsulating action research management in schools. However, challenges such as limited discussion platforms, resource constraints, and contextual barriers persist, necessitating enhanced reflective practices and collaborative learning. While bibliometric analysis provides quantitative insights, the study advocates for complementing such approaches with qualitative methods to ensure a comprehensive understanding of action research management in schools, guiding future strategies in educational research.

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1. INTRODUCTION

Action research holds paramount importance in school management by empowering educators. Underpinned by the concepts of reflective practice and participatory inquiry, action research offers educators a systematic way to methodically tackle real-world issues and bring about significant transformations in learning environments. The purpose of this introduction is to emphasize the significance and relevance of action research in school administration. It sheds light on the crucial role that action research plays in enhancing instructional strategies, improving student learning outcomes, and fostering growth among educators.

Central to the ethos of action research is its capacity to catalyze pedagogical transformation and refinement. Through iterative cycles of planning, action, observation, and reflection, educators are allowed to critically examine their instructional practices, identify areas for improvement, and implement evidence-based interventions informed by empirical inquiry [1], [2]. Through collaborative inquiry and data-driven decision-making, educators are empowered to critically assess their instructional strategies and tailor them to

meet the diverse needs and learning styles of their students [3], [4]. This approach fosters highly inclusive and equitable learning environments that ensure every student can succeed.

Beyond its impact on teaching practices, action research exerts a profound influence on student learning outcomes, serving as a conduit for enhancing academic achievement and fostering socio-emotional growth. By embracing an inquiry-based approach to teaching and learning, educators are better equipped to assess the efficacy of instructional strategies, diagnose learning barriers, and design targeted interventions to scaffold student success [5], [6]. Moreover, the collaborative nature of action research engenders a culture of shared responsibility and collective efficacy among educators, resulting in more cohesive and responsive educational communities that prioritize the holistic development of every learner [1], [7].

At its core, action research catalyzes professional growth and lifelong learning among educators, allowing them to reflect on their practice critically, expand their pedagogical repertoire, and cultivate a disposition of inquiry-driven scholarship [8]. Through collaborative inquiry projects and participatory action research (PAR) initiatives, educators leverage their collective expertise to challenge conventional wisdom and innovate within their respective domains. By engaging in collaborative inquiry projects and PAR initiatives, teachers can leverage their collective expertise and experiences to co-construct knowledge, challenge conventional wisdom, and innovate within their respective domains [9], [10]. Moreover, the dissemination of action research findings through professional learning communities and scholarly publications serves to enrich the broader educational discourse, fostering a culture of knowledge sharing and continuous improvement within the profession [11].

Research by Tian and Huber [12] reviewed 2,347 publications from 15 core educational leadership, administration, and management (EdLAM) journals published from 2007 to 2016, identifying five main thematic strands: improving student achievement, promoting change and accountability, advocating for social justice, enhancing instructional leadership, and examining collaborative leadership's impact on school dynamics and teacher well-being. Their bibliometric analysis underscores the value of action research in enhancing these areas by facilitating collaboration between teachers and management to address key educational issues. Bibliometric analysis helps in understanding the influence, visibility, and trends within PAR [13], [14]. Research by Galletta and Torre [15] showed that PAR supports transformative change and challenges traditional power structures, while Johari *et al.* [16] highlighted its positive effects on teaching methods. By analyzing metrics and trends, bibliometric analysis offers essential insights for advancing PAR in educational settings, guiding scholars, instructors, and policymakers in improving educational practices.

To enhance understanding of action research in management, scholars and practitioners should explore organizational dynamics, leadership strategies, and decision-making in education. A bibliometric analysis aids in making evidence-based decisions, encourages interdisciplinary dialogue [17], [18], and fosters new knowledge and paradigms [19]. This dialogue is essential for adapting to changes in action research management and shaping the future of education by addressing emerging challenges. By combining diverse expertise, scholars can uncover new perspectives and solutions that might not emerge within single specialty [20]. The analysis aims to offer a thorough understanding of managing action research in schools, inviting engagement from scholars, policymakers, and practitioners. The goal is to capture the essence of action research management and set the stage for future improvements and innovations in educational practices. This approach will ultimately benefit students, educators, and educational institutions. The research will investigate several research questions (RQ):

i) RQ1: what are the current research trends in managing action research in schools?
ii) RQ2: what are the key characteristics of journals analyzed in terms of publication numbers, countries of publication, impact factors, and indexing in the social sciences citation index (SSCI)?
iii) RQ3: what approach is proposed for managing action research in schools based on the identified clusters of keywords, and how does it aim to address interconnected research themes and drive continuous improvement in educational practices?
iv) RQ4: what are the key statistics regarding the number of co-authors per article, top contributing authors, countries represented, and distribution of articles across countries in the dataset?
v) RQ5: what are the key details about the authors and their affiliations in the most cited article, including the number of authors, their institutions, and the countries they represent?
vi) RQ6: what are the common limitations of managing action research in schools, as outlined in the two articles mentioned in the statement?

2. METHOD
2.1. Research design

This paper aims to analyze the latest trends in the scholarly literature on the management of action research in schools through the use of bibliometric analysis. Bibliometrics analyzes citation counts,

authorship patterns, publication trends, and impact factors; it is important for researchers and academics [21], [22]. Study by Moed [23] emphasized the significance of bibliometric assessments for understanding scholarly activity and performance, while also acknowledging its policy importance. In scientific research, it is crucial to have a broader understanding of prior research on relevant topics [24], as well as a bibliometric analysis of global research activities [25].

2.2. Dataset

This study analyzes articles in Scopus and Web of Science (WoS) databases for their extensive and diverse article collections. The search strategy was title: "action research AND educational AND management AND school". DocType: Article. PUBYEAR: <2024. Scopus and WoS search results can be exported to an excellent tools like VOSViewer [26] for further investigation [27], [28], which is crucial for visualizing bibliometric data into scientific field development, research trends, and performance metrics in today's technological landscape [29], [30]. This study relied on the WoS database for data collection due to its strong coverage since 1990 and its focus on high-quality, peer-reviewed journals, as indicated by Clarivate analytics' journal citation reports (JCR) [31]–[33]. Unlike Scopus, which impacts recent articles, WoS provides a deeper historical perspective, ensuring the inclusion of prestigious publications [34], [35].

2.3. Data analysis

In this study, the authors used PRISMA guidelines for systematic review and meta-analysis, to ensure transparency, rigor, and credibility of the findings. The systematic review process began with the formulation of a research question and the development of inclusion and exclusion criteria. Using these criteria, the authors conducted a comprehensive search of relevant literature using specified keywords and search strings. The search strategy involved multiple electronic databases, including Scopus and WoS, to identify all potentially relevant studies. A series of searches were carried out which used various combinations of the following keywords string: TITLE-ABS_KEY ("action* research") AND educational AND management AND school. After retrieving the initial set of articles, the authors applied additional selection criteria to screen for eligibility. This process involved assessing the titles, abstracts, and full texts of the retrieved articles to determine their relevance to the research question. Articles that met the inclusion criteria were included in the final analysis, while those that did not meet the criteria were excluded. The final search string in Table 1 [36] and selection criterion showed in Table 2 [37] refinement included 337 published papers from WoS which were used for bibliometric analysis. The PRISMA flow diagram, as depicted in Figure 1 [38], illustrates the systematic process of article selection and screening. This diagram provides transparency regarding the number of articles retrieved, screened, and included in the final analysis, thereby enhancing the reproducibility of the study.

Table 1. The final search string [36]

Database	The search string
Scopus	TITLE-ABS-KEY(("action* research") AND educational AND management AND school) AND PUBYEAR > 1975 AND PUBYEAR < 2024 AND (LIMIT-TO (DOCTYPE,"ar")) AND (LIMIT-TO (LANGUAGE,"English"))
WoS	("action* research") AND educational AND management AND school (All Fields) and Article (Document Types) and English (Languages) and 2024 (Exclude – Publication Years)

Table 2. The selection criterion [37]

Criterion	Inclusion	Exclusion
Language	English	Non-English
Time frame	First publisher–2023	2024
Literature type	Journal (Article)	Book chapter, review article, early access, proceeding paper, editorial material, note

3. RESULTS AND DISCUSSION

The publication growth observed in the WoS database over the years reflects the increasing interest and scholarly activity in the field of action research in educational management and school contexts. From its initial appearance in 1976 in Scopus and later in 1989 in WoS, the number of publications related to action research has shown a steady upward trajectory as shown in Figure 2. This growth is evident in the data extracted on April 4th, 2024, which reveals a consistent increase in the number of publications over different periods. Between the years 1976 and 2002, there were a total of 9 publications identified in WoS. This relatively low number may indicate a nascent stage of research activity or limited recognition of action research within scholarly circles during this period. However, from 2002 to 2013, there was a notable

increase in publications, with the number rising to 85. This surge in publications suggests a growing interest in action research as a methodological approach to addressing educational challenges and improving school management practices. The most significant growth occurred in the most recent time frame, from 2014 to 2023, during which the number of publications soared to 243. This exponential increase underscores the heightened attention and recognition that action research has garnered within the academic community in recent years.
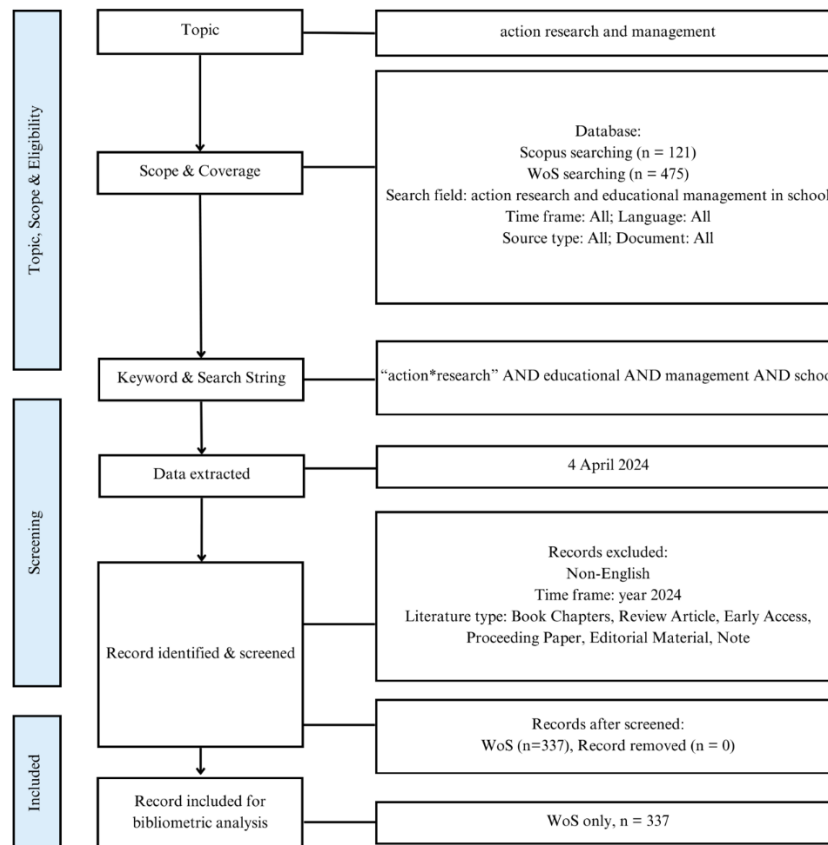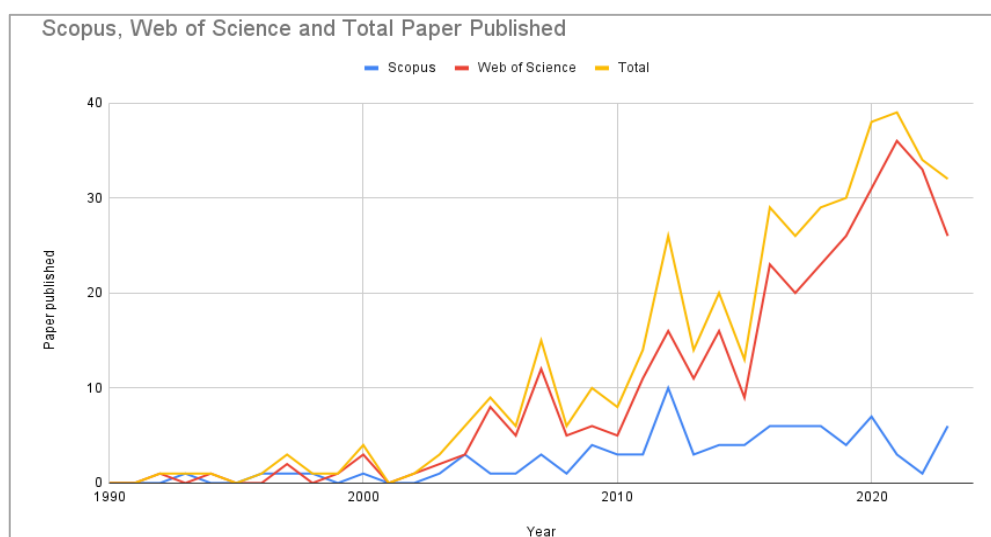

Figure 1. PRISMA flow diagram [38]

Figure 2. Annual evolution-published papers

3.1. Journal information and publication bibliometric analysis

The goal of using bibliometric analysis to examine journal details and publications is to determine where research on managing action research in schools is published and its frequency. This analysis helps researchers and educators identify reputable sources and stay informed about recent developments. The study found that the articles appeared in 238 international journals, with five journals publishing three or more articles: Educational Action Research (18 articles), South African Journal of Education (6 articles), School Leadership and Management (5 articles), Educational Management Administration and Leadership (4 articles), and Cambridge Journal of Education (3 articles). Of these, four journals are based in the United Kingdom and three in South Africa. The school leadership and management journal has the highest journal impact factor for 2022 [39], while school leadership and management and educational management administration and leadership have the highest SJR 2023 scores. The most common WoS categories are education, educational research, and management, with 46.3% of these journals indexed in the SSCI.

Table 3 shows more details about these journals, including their impact and ranking. For example, Educational Action Research has 18 articles, a Journal Impact Factor (JIF) of 1.26, and is ranked in the top quartile (Q1). South African Journal of Education has a slightly lower SJR but is also ranked in Q1. Both School Leadership and Management and Educational Management Administration & Leadership have high impact factors (3.64 and 3.50), making them significant journals for publishing research in school leadership and management. Cambridge Journal of Education, while publishing fewer articles, still has a strong ranking and influence.

Table 3. Journals information

Journal	#	Country	JIF 2022	SJR 2023	JCI Category	Q	H-Index
Educational Action Research	18	United Kingdom	1.2	0.76	ESCI edition	Q1	46
South African Journal of Education	6	South Africa	0.8	0.29	SSCI edition	Q3	40
School Leadership and Management	5	United Kingdom	5.2	1.47	ESCI edition	Q1	53
Educational Management Administration and Leadership	4	United Kingdom	3.6	1.47	SSCI edition	Q1	60
Cambridge Journal of Education	3	United Kingdom	2.3	1.17	SSCI edition	Q1	69

3.1.1. Research question 1
a.   Rise in publication rates

The analysis indicates a significant increase in publication rates related to managing action research in school. The bibliometric data in Figure 2 indicates an annual increase in publications, with numbers growing from 9 in 2002 (3%), 85 between 2002 and 2013 (25%), to 243 from 2014 to 2023 (72%). This steady rise, especially significant from 2014 onwards, reflects a growing interest among researchers and educators in action research practices within educational settings.

b.   Focus on collaborative problem-solving and inclusivity

There is a clear trend towards collaborative problem-solving and inclusivity in managing action research in schools. Educators and researchers are increasingly valuing collaborative methods to tackle complex educational challenges and promote diversity within learning environments. Collaborative problem-solving encourages shared responsibility and deeper engagement among educators, fostering a stronger sense of community. Additionally, inclusivity ensures that the diverse needs of students are addressed, leading to more equitable educational outcomes.

c.   Emphasis on knowledge and leadership

Research themes related to knowledge and leadership emerge as prominent areas of focus in managing action research in schools. This emphasis underscores the importance of informed decision-making and effective leadership in driving action research initiatives to improve educational practices and outcomes. Knowledgeable leaders are better equipped to guide teachers in reflective practices, fostering a culture of continuous improvement. Moreover, leadership plays a crucial role in building a supportive environment that encourages innovation and empowers educators to take ownership of action research projects.

d.   Global perspective and collaborative efforts

The trend towards a global perspective on educational action research and engagement, care and impact, and empowerment and participation, showcasing interconnectedness across research topics. These themes provide a comprehensive understanding of action research management in schools and guide future research directions to drive continuous improvement in educational practices. The trend towards a global perspective on educational management and action research is evident in the diverse contributors from various countries identified in the analysis.

The increase in publications about managing action research in schools shows a growing interest in its benefits. This trend matches findings from recent studies that highlight a rise in collaborative problem-solving and leadership in educational research [12]. Effective leadership and knowledge use are essential for successful action research, as supported by previous research on these themes [13], [14].

3.1.2. Research question 2
a. Publication numbers

The analysis encompasses a wide range of international journals, totaling 238, where 337 articles were published. Notably, five of these journals stand out by publishing three or more articles each, indicating their significance in disseminating research on managing action research in schools. Educational Action Research leads with 18 published articles, demonstrating its key role in the field. This concentration of articles in a select few journals highlights their influence and the focused nature of research dissemination within these publications.

b. Countries of publication

The journals exhibit a diverse geographical spread, with a notable concentration in the United Kingdom and South Africa. This distribution highlights the global reach of action research in educational management, with contributions from various regions. The prominence of the United Kingdom, which hosts four of the five most influential journals, reflects its leading role in publishing research on school leadership and action research. Meanwhile, the inclusion of South African journals underscores the growing importance of educational research in developing regions, contributing valuable perspectives to the global discourse.

c. Impact factors

The impact factors show the scholarly influence of the journals. The school leadership and management journal had the highest impact factor in 2022 and both it and the educational management administration and leadership journal had top SJR scores in 2023, indicating their importance in educational research. These high impact factors reflect the quality and relevance of the research published in these journals, which often focus on leadership, management, and policy in education. The strong impact factors also suggest that these journals attract high-quality that influence both academic research and practical applications in schools.

d. Indexing in social sciences citation index

Nearly half of the analyzed journals (46.3%) are indexed in the SSCI. This indexing enhances the visibility and accessibility of the journals' content, facilitating wider dissemination and citation of research findings. It also signifies the scholarly rigor and quality of the journals, as inclusion in SSCI requires meeting certain citation and impact criteria.

e. WoS categories

The most common categories for these journals in the WoS are education, educational research, and management. This highlights the interdisciplinary nature of action research in schools, covering multiple fields. In summary, these important traits show the varied and impactful journals that share research on managing action research in schools, emphasizing how scholarly sharing and influence help improve education.

The variety of journals and their high impact factors underscore the global significance of action research. Journals from the United Kingdom and South Africa reflect the international reach of this field, and high-impact journals like "School Leadership and Management" play a key role in spreading important research [15], [16]. This aligns with earlier studies showing the impact of reputable journals on educational research [17].

3.2. Keywords bibliometric analysis

Co-occurrence analysis identifies meaningful relationships and patterns within a dataset, particularly the occurrence of keywords. In this study on managing action research in schools, co-occurrence analysis revealed thematic connections among keywords in 337 publications, using 1,698 keywords. The analysis focused on keywords appearing at least 8 times, resulting in 25 keywords forming four clusters. Figure 3's co-occurrence network visualization shows the largest cluster (red) includes knowledge, leadership, management, science, teachers, and work. The second cluster (green) features action research, education, engagement, motivation, school, skills, and students. The third cluster (blue) consists of care, children, impact, intervention, and model, while the fourth cluster (yellow) includes empowerment, health, PAR, program, and reflection. The clusters are closely grouped, indicating researchers in related clusters are often cited together. The analysis found 162 links between keywords, with a total link strength of 305, representing the degree of association among them.
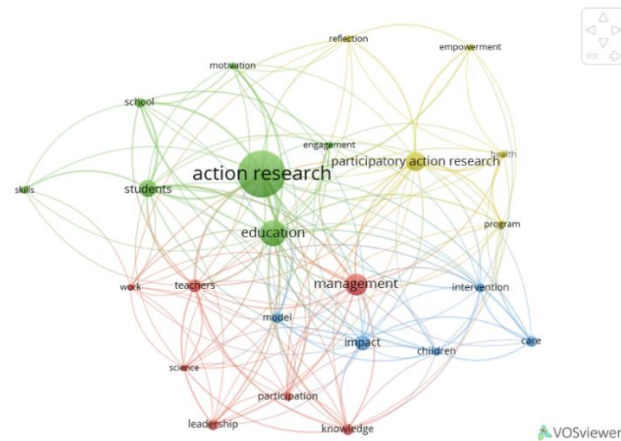
Figure 3. Keywords co-occurrence network visualization map

The thematic clusters identified are as i) cluster 1: knowledge and leadership (red) focusing on leadership and management; ii) cluster 2: action research and educational engagement (green) addressing engagement and educational outcomes; iii) cluster 3: care and impact (blue) concerning interventions and care; iv) cluster 4: empowerment and reflection (yellow) highlighting empowerment and reflective practices. These clusters are interconnected, with leadership influencing engagement, which impacts care and interventions, while empowerment and reflection assess and enhance these effects.

3.2.1. Research question 3
a. Utilizing clusters of keywords
The analysis identifies 25 keywords organized into four clusters: knowledge and leadership, action research and engagement, care and impact, and empowerment and PAR. These clusters provide a framework for understanding interconnected research themes and guiding management strategies. By focusing on these clusters, schools can adopt a more holistic approach to managing action research, ensuring that leadership and knowledge sharing are integrated with teacher engagement and participatory methods. This approach promotes continuous improvement by fostering a collaborative environment where research is used to address real-world educational challenges and enhance teaching practices.

b. Addressing interconnected themes
The clusters highlight related topics, indicating researchers cited in one cluster are often cited in others. This interconnectedness underscores the need for a comprehensive approach to action research management that addresses multiple themes simultaneously, allowing school administrators to develop holistic strategies. By integrating themes such as leadership, engagement, and empowerment, schools can create a cohesive framework that encourages collaboration among educators. This interconnected approach also supports continuous improvement by ensuring that action research initiatives are aligned with broader educational goals, fostering sustained progress in teaching and learning practices.

c. Holistic approach to management
The proposed approach integrates strategies encompassing leadership, engagement, care, and empowerment. By leveraging the keyword clusters, school administrations can tailor management practices to promote inclusive and equitable educational environments, recognizing the multifaceted nature of action research. This approach ensures that leadership fosters collaboration, while empowerment strategies encourage teacher and student participation in the research process. Additionally, focusing on care and engagement helps to create a supportive environment where continuous reflection and improvement are embedded in everyday educational practices.

d. Implementation, coordination, and evaluation
Key to the approach is the systematic management of action research projects through initiation, coordination, and evaluation. This ensures continuous improvement and innovation, enhancing student outcomes and school effectiveness. Effective implementation involves setting clear objectives and aligning action research with school priorities, ensuring that all stakeholders are engaged from the start. Coordination ensures that resources and efforts are efficiently managed, while ongoing evaluation helps monitor progress, refine strategies, and measure the impact of the action research on both teaching practices and student

achievement. The analysis identified 25 keywords in four clusters, highlighting interconnected themes [1]. A comprehensive approach integrates leadership, engagement, care, and empowerment strategies to address diverse educational needs [2]–[4]. Effective management involves initiating, coordinating, and evaluating research initiatives to drive continuous improvement and enhance student outcomes [5], [6].

3.3. An examination of the co-authorship based on bibliometric analysis

By looking at how many authors work together on articles, the study aims to see how much collaboration happens and who the main contributors are. In the dataset, it is observed that 19% of the articles were authored by three individuals, while 16% had four authors, and 13% involved two co-authors as shown in Figure 4. This distribution sheds light on the collaborative patterns among researchers in the field of action research management in schools. Additionally, there are four standout authors who have contributed significantly to the literature, each having authored three or more articles. Specifically, Wood has authored four articles [40]–[43], while Chen [44]–[46], Huynh-Lam and Vu-Thi [47]–[49], have each contributed three articles, as detailed in Table 4. These prolific authors may have made notable contributions to advancing knowledge and understanding in the field, and further exploration of their work could provide valuable insights into prevailing research trends and areas of focus within the domain of action research in school management.
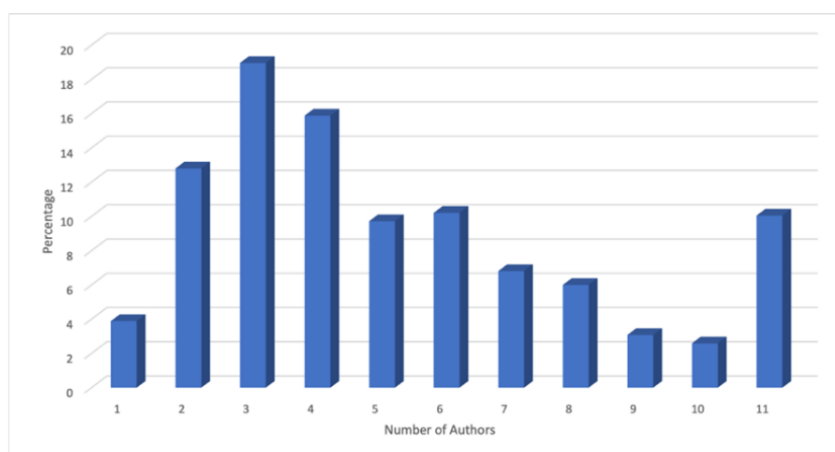

Figure 4. Number of authors

Table 4. Author with more articles

Author	Number of articles	Organization
L. Wood [40]–[43]	4	North West University, South Africa
Y.-C. Chen [44]–[46]	3	National Tsing Hua University, Taiwan
A.-C. Huynh-Lam [47]–[49]	3	Thu Dau Mot University, Vietnam
N.-B. Vu-Thi [47]–[49]	3	Thu Dau Mot University, Vietnam

3.3.1. Research question 4
a. Co-authors per article

The presence of multiple co-authors in a significant percentage of articles (19% with three co-authors, 16% with four co-authors, and 13% with two co-authors) suggests a collaborative approach to conducting and disseminating research findings. Collaborative efforts often lead to a more comprehensive exploration of research topics and contribute to the collective expertise within the field of managing action research in schools. This teamwork enables the sharing of diverse perspectives, enriching the research outcomes. Additionally, co-authorship helps distribute the workload, allowing for more rigorous and in-depth analysis of complex educational issues.

b. Top contributing authors

The dataset identifies four authors who have significantly contributed to three or more articles: Wood (4 articles) [40]–[43], Chen (3 articles) [44]–[46], Huynh-Lam (3 articles), and Vu-Thi (3 articles) [47]–[49]. These authors emerge as leading contributors to the body of literature on managing action research in schools, indicating their substantial impact and expertise in the field. Their consistent contributions

highlight their ongoing research involvement, shaping key discussions and developments in educational action research. The presence of multiple articles from these authors suggests a focused commitment to advancing both theoretical and practical aspects of action research management in schools.

c.   **Global representation of authors**

The dataset encompasses a diverse pool of authors, totaling 1,234 individuals representing 64 countries. This global representation underscores the widespread interest and engagement in action research management across various geographical regions and cultural contexts. It also reflects the diverse perspectives and experiences contributing to the body of literature on managing action research in schools.

d.   **Distribution of articles across countries**

The distribution of articles across countries reveals notable contributions from England (20%), Australia (16%), United States (13%), South Africa (6%), Spain (6%), and Canada (5%). This distribution highlights the international scope of research on managing action research in schools, with significant contributions from diverse regions worldwide. It also underscores the global relevance and applicability of findings in addressing educational challenges and advancing practices in different contexts. Research is often collaborative, with many articles having multiple co-authors, indicating a comprehensive exploration of topics [7]. Leading contributors include Wood, Chen, Huynh-Lam, and Vu-Thi [40]–[49], who have significantly impacted the field [8], [9]. The global dataset features 1,234 authors from 64 countries, showing broad interest and highlighting major contributions from regions like England and Australia [10], [11].

3.4. Geographical distribution of publication

The dataset includes 1,234 authors from 64 countries, highlighting the international nature of research on action research management in schools. Leading contribution are England (20%), Australia (16%), the United States (13%), South Africa and Spain (6%), and Canada (5%) as shown in Figure 5. This geographic diversity demonstrates widespread interest and engagement in the topic across different regions. It indicates that action research management is a global endeavor, enriched by contributions from various cultural and educational contexts. Analyzing research outputs from these countries can provide valuable insights inti unique perspectives and approaches to educational challenges.
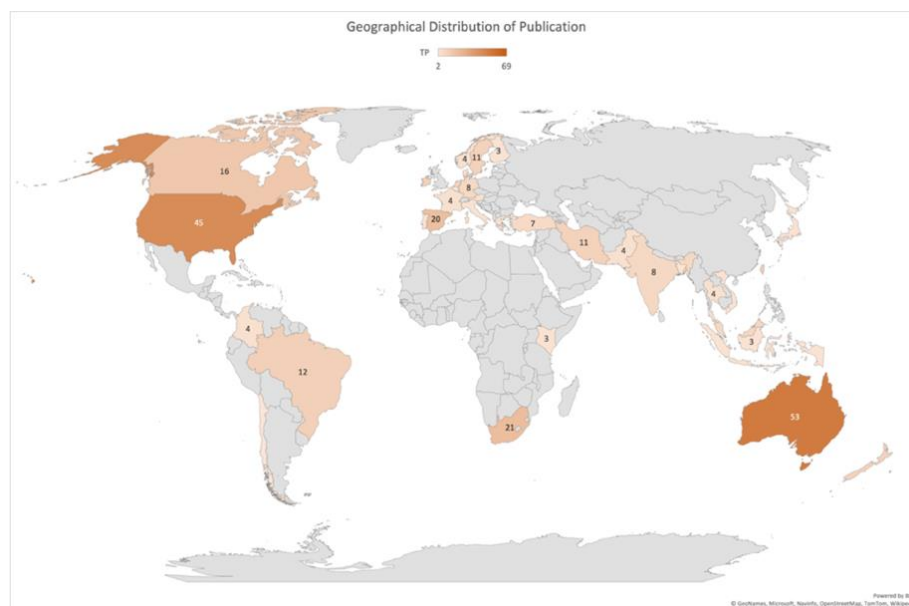

Figure 5. Geographical distribution of publication

3.5. Analysis of highly cited papers

This analysis highlights the most influential papers in the field of action research management in schools by examining their citation. Table 5 lists the top 10 papers with the most citation, showcasing their impact on research trends, methodologies, and interventions. Shirk *et al.* [50] received 732 citations for their framework on citizen science. Elias *et al.* [51] garnered 259 citations for their study on implementing and

sustaining social-emotional and academic programs in public schools. Hopkins *et al.* [52] received 119 citations for their review on school and system improvement. These highly cited paper offers valuable insights and inform future research and policy decisions in educational leadership and school management.

Table 5. Most cited papers

Author	Year	Times
Shirk *et al.* [50]	2012	732
Elias *et al.* [51]	2003	259
Hopkins *et al.* [52]	2014	119
Dube [53]	2020	113
Putz *et al.* [54]	2020	96
Israel *et al.* [55]	1989	87
Arnold [56]	2017	82
Bennett *et al.* [57]	2016	42
Calabrese [58]	2006	29
Hanafin [59]	2014	24

3.5.1. Research question 5
a.   Number of authors

The most cited article has 11 authors, indicating a collaborative effort with diverse perspectives and expertise. Such a large number of contributors suggests that the research likely involved interdisciplinary collaboration, incorporating various viewpoints and areas of specialization. This kind of teamwork often enhances the depth and breadth of the research, enabling a more comprehensive analysis of complex educational issues. Furthermore, having multiple author increases the article's reach and credibility, as it draws on the collective knowledge and expertise of a broad of scholars.

b.   Institutions and affiliations

The authors are affiliated with various academic institutions, including the University of California (Jennifer and Heidi), Dickinson College, Pennsylvania (Candie), University of New Mexico, Albuquerque (Tina and Andrea), Rutgers State University, New Jersey (Rebecca), Cornell University, New York (Ellen, Matthew, Bruce, Marianne, and Bonney). This showcases the collaborative nature of the research. The involvement of multiple prestigious institutions highlights the article's strong academic foundation and suggests that the research benefited from a wide range of institutional resources and expertise. Such a diverse network of affiliations also indicates the global relevance of the research, with scholars from different regions contributing to a common goal.

c.   Countries represented

The authors are from nine different countries, with the United States being the most frequent, highlighting the global engagement and diverse perspectives in the research. The presence of multiple institutions highlights a pattern of collaboration of 11 authors from prominent United States institutions, notably Cornell University, indicating its significant role in the research field. The global diversity of the authors across nine countries highlights the international impact and broad relevance of the study.

The most cited article features 11 authors from various institutions, indicating a collaborative effort that brings together diverse expertise [7]. This aligns with the literature on action research, which emphasizes the importance of diverse perspectives and collaboratives efforts for robust research outcomes [8]. The international representation of the authors reflects a global engagement in action research, highlighting the widespread relevance and impact of the study across different countries [9], [10].

3.6. International collaboration and diversity in research contributions

This analysis is to understand the global nature of scholarly engagement and the significance of diverse perspectives in addressing educational challenges and advancing knowledge in school management and leadership. Among the authors of the 10 most cited articles, their affiliations span nine different countries, showcasing the international collaboration and diversity in research contributions. The United States emerges as the most frequent country of affiliation among these authors, indicating its prominent role in producing influential research in the field of action research management in schools as shown in Table 6. This highlights the global nature of scholarly engagement in addressing educational challenges and advancing knowledge in school management and leadership. Additionally, the presence of authors from various countries underscores the importance of diverse perspectives and insights in tackling complex issues within the education sector.

Table 6. Author affiliation, more cited articles

	Author	Affiliation
1	J. L. Shirk, H. L. Ballard	University of California, United States
	C. C. Wilderman	Dickinson College, United States
	T. Phillips, A. Wiggins	University New Mexico, United States
	R. Jordan	Rutgers State University, United States
	E. McCallie, M. Minarchek, B. Lewenstein, M. Krasny, R. Bonney	Cornell University, United States
2	M. J. Elias, J. E. Zins	Rutgers University, United States
	P. A. Graczyk	University Cincinnati, United States
	R. P. Weissberg	University Illinois, United States
3	D. Hopkins, L. Stoll	University London, England
	S. Stringfield	University Cincinnati, United States
	A. Harris	University Malaya, Malaysia
	T. Mackay	Centre for Strategic Education, Australia
4	B. Dube	University Free State, South Africa
5	L.-M. Putz, F. Hofbauer	University of Applied Sciences Upper Austria, Austria
	H. Treiblmaier	Modul University Vienna, Austria
6	B. A. Israel, S. J. Schurman, J. S. House	University Michigan, United States
7	M. Arnold	University Oldenburg, Germany
8	S. Bennett, S. Low	University Queensland, Brisbane, Australia
	M. Whitehead, S. Eames, J. Fleming, E. Caldwell	Princess Alexandra Hospital, Australia
9	R. L. Calabrese	Wichita State University, United States
10	J. Hanafin	University Limerick, Ireland

3.7. Analysis of academic articles, author affiliation from Malaysia

This analysis highlights the contribution of Malaysian scholars to action research in education, both locally and internationally. Table 7 presents a range of academic articles from Malaysian and international institutions, showing Malaysia's significant role in advancing this field. The articles offer diverse perspectives and insights into educational challenges and practices. However, the depth of analysis varies among them. For example, articles "let them fish!" and assessment rubric for research report writing address practical educational challenges, while "empowering learners' reflective thinking through collaborative reflective learning" needs further exploration to fully understand how action research enhances reflective thinking. Overall, this compilation provides a broad overview and identifies gaps for future research.

3.7.1. Research question 6

The focus on the two articles was intentional to provide an in-depth analysis of specific limitations highlighted within these studies. These articles were selected due to their detail exploration of relevant issues and their relevance to the research question. By concentrating on these works, the analysis aims to uncover recurring challenges in managing action research in schools, providing valuable insights into obstacles that practitioners commonly face. This approach allows for a deeper understanding of the practical constraints and complexities involved in implementing action research effectively.

Table 7. Articles, author affiliation from Malaysia

	Author	Affiliation
1	Goh and Loh [60]	Monash University; Monash University Malaysia
2	Yaacob et al. [61]	Universiti Utara Malaysia
3	Soh et al. [62]	Universiti Putra Malaysia; Johns Hopkins University; University of Technology Sydney; Curtin University
4	Perera et al. [63]	Shangrao Normal University; Universiti Malaya; Taylor's University
5	Hopkins et al. [52]	UCL Institute of Education; University System of Ohio; Universiti Malaya; University of Cincinnati; Melbourne Genomics Health Alliance
6	Bukhari et al. [64]	Universiti Utara Malaysia
7	Kaprawi et al. [65]	University of Tun Hussein Onn Malaysia; University of Bremen
8	Aziz et al. [66]	Universiti Kebangsaan Malaysia; Universiti Teknologi MARA; International Islamic University Malaysia

a.   Lack of training

On common limitation identified in article "empowering learners' reflective thinking through collaborative reflective learning" and "assessment rubric for research report writing: a tool for supervision" is the lack of training among educators and researchers in conducting action research. Without adequate training and guidance, educators may struggle to effectively implement action research methodologies, hindering the successful execution of research projects. This gap in skills development can result in poorly designed studies and limited understanding of how to use action research to drive meaningful educational improvements.

b.   Limited platform for discussion

Another shared limitation is the limited platform for discussion among students. In some educational settings, there may be inadequate opportunities for students to engage in meaningful discussions and reflections as part of the action research process. This limitation can impede collaborative learning and inhibit the development of reflective thinking skills among students.

c.   Complexity of the process

The article by Bukhari *et al* [64] highlighted the complexity of the action research process, which can be time-consuming and require coordination among various stakeholders and resources. This complexity can pose challenges, particularly in terms of navigating bureaucratic processes and securing necessary resources for research initiatives. Additionally, the multifaceted nature of action research often demands significant commitment from educators, who must balance research activities with their existing teaching responsibilities, further complicating its effective management.

d.   Resource constraints

Both articles acknowledge resource constraints, such as limited time, funding, and expertise, as significant challenges in managing action research in schools. Insufficient resources can hinder the implementation of research projects and limit the scope and impact of action research initiatives. Additionally, the lack of adequate support systems and infrastructure further exacerbates these constraints, making it difficult for educators to sustain long-term research efforts and fully integrate findings into school improvement strategies.

e.   Maintaining momentum and sustainability

Maintaining momentum and sustaining the impact of action research initiatives over the long term is another shared limitation. Without ongoing support and commitment from stakeholders, there is a risk that the benefits of action research may not be sustained, and the impact of research projects may diminish over time. Additionally, changes in school leadership or shifting institutional priorities can further disrupt the continuity of action research efforts, making it challenging to embed research-driven improvements into school practices permanently.

f.   Generalizability and ethical considerations

Lastly, both articles highlight issues related to the generalizability of findings and ethical considerations in conducting action research. Generalizability refers to the extent to which research findings can be applied to broader contexts, while ethical considerations encompass issues such as confidentiality, consent, and the protection of participants' rights in research studies. Furthermore, the unique contextual factors in individual schools may limit the transferability of findings, necessitating careful consideration of local contexts when applying action research outcomes to other educational settings.

The common limitations of managing action research in schools include insufficient training for educators, limited opportunities for student discussion, and the complexity of the research process [1], [2], [6]. Resource constraints and challenges in maintaining momentum and sustainability also impact the effectiveness of action research initiatives [10], [14], [18]. Additionally, issues related to generalizability and ethical considerations further complicate the implementation of action research [22], [23].

4.   CONCLUSION

This bibliometric analysis reveals a steady increase in publications on the management of action research in educational settings since 2003, highlighting a growing interest in collaborative problem-solving, inclusivity, and global perspectives. Key findings include the diverse and global nature of research, characterized by statistics on co-authors, top contributing authors, and the geographic distribution of articles. Proposed approaches for managing action research emphasize leveraging keyword clusters and integrating strategies encompassing leadership, engagement, care, and empowerment to foster inclusive practices. Common limitations identified include training challenges, limited discussion platforms, contextual constraints, and resource limitations. The analysis underscores the interconnectedness of research themes and the importance of addressing diverse needs in educational settings. While bibliometric analysis provides valuable quantitative insights, it has limitations, such as reliance on indexed databases and lack of qualitative evaluation, necessitating a balanced approach with qualitative methods for comprehensive understanding.

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