



Journal of Contemporary Social Science and Education Studies

E-ISSN: 2775-8774


Vol 4, Issue 2 (2024)

Doi: 10.5281/zenodo.13422292

A DECADE OF PROGRESS: A BIBLIOMETRIC ANALYSIS OF RESEARCH TRENDS IN PROFESSIONAL DEVELOPMENT FOR MIDDLE LEADERS IN EDUCATION (2014-2023)

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Article Info	ABSTRACT
<p>Article history:</p> <p>Received: 19 July 2024 Revised: 16 August 2024 Accepted: 25 August 2024 Published: 1 Sept 2024</p> <p>Keywords:</p> <p>Middle Leaders, Professional Development, Educational Leadership, Bibliometric Analysis, Research Trends, School Management, Leadership Competencies</p> <p></p>	<p>During an era of rapid change and progress in education, the professional growth of middle leaders has become crucial for successful school administration and student achievement. Nevertheless, there needs to be a more thorough comprehension of worldwide research patterns in this particular area. This study aims to fill this void by examining the patterns of professional growth for middle leaders in the field of education between the years 2014 and 2023. The research conducted an in-depth examination of 287 papers indexed in Scopus. Innovative approaches such as co-citation analysis and keyword co-occurrence mapping utilizing VOSviewer software were employed. The study identified important themes, regional contributions, and emerging areas of interest. The findings reveal a significant increase in publications, primarily from the United States, United Kingdom, and Australia. There is also a noticeable trend towards comprehensive development strategies, including leadership abilities, psychological well-being, and data-driven decision-making. The study identifies deficiencies in research conducted in non-Western settings and emphasizes the necessity for additional investigation on digital leadership skills. These insights provide useful assistance for policymakers and educational leaders in designing customized professional development programs. They highlight the significance of adaptable, culturally sensitive leadership development strategies in effectively navigating the intricacies of contemporary educational settings.</p>

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INTRODUCTION

The role of intermediate leaders is evolving rapidly within the educational leadership environment, becoming increasingly complex and crucial. Typically situated between upper management and classroom teachers, intermediate managers have a significant impact on the organization's goals and the resources available to classroom teachers (Fitzsimons, 2021; Grootenboer et al., 2023). In this century of unprecedented challenges and opportunities, the professional development of middle leader teams is crucial to the success of organizations and the quality of education.

Middle management is not a novel concept, but it has evolved significantly over the past many years. Middle leaders are being required to handle intricate webs of relationships and obligations as schools move away from top-down models of leadership and towards more decentralized ones (Effendi et al., 2020; Margolis & Strom, 2020; Harris & Jones, 2017). A new approach to professional development for middle leader teams is required to help them adapt to this transition. Strong middle leadership was associated with improved student results, more effective teachers, and a more positive school climate, according to Leithwood et al. (2020).

The importance of middle management is well-known, but this crucial group still needs dedicated professional development opportunities. According to recent research (Bryant et al., 2020; Fitzsimons, 2021; Vikaraman, 2020; Thorpe & Bennett-Powell, 2014), professional development programs can be a great help to middle leaders who are trying to balance the roles of senior leadership and classroom instruction. There is serious cause for concern about this difference because middle leadership is multi-faceted and requires subject-matter knowledge, organizational savvy, and the capacity to inspire and encourage subordinates.

The constantly changing educational landscape further underscores the need for specialist professional development for middle-leader teams. A more diverse student body, evolving pedagogical practices, and ever-evolving digital technology all necessitate ongoing professional development for educational leaders at all levels (Vikaraman, 2020; Fullan, 2020). The intermediate layers of leadership are driving these changes because of the unique role they play in bridging the gap between strategy and implementation. Investment in professional development is essential for educational institutions to thrive in a changing environment, as it goes beyond personal growth.

RESEARCH QUESTION

A comprehensive review over the last several decades is necessary to investigate pertinent publications in light of the current literature gap. Consequently, the literature on professional development for middle school leaders was assessed and mapped using a bibliometric analysis. By answering the following four research questions, this analysis will give a detailed discussion of publications about professional development:

1. What are the research trends of the published documents on professional development for the middle leader team?
2. What or who are the main contributions in terms of journals, authors, countries, and documents on professional development for middle leader team?
3. What are the most frequently discussed themes and the corresponding evolving trends in professional development for middle leader team?
4. What are the popular keywords related to the study?

METHODOLOGY

This study employs a comprehensive bibliometric analysis to examine the research landscape of professional development, particularly in the context of middle leadership in education. Bibliometrics, as defined by Verbeek et al. (2002), is the systematic analysis and quantification of bibliographic data obtained from scientific publications. This methodology allows for a comprehensive examination of publication patterns, notable authors, prominent journals, and the development of themes within a specific research field (Zupic & Čater, 2015). The Scopus database was selected as the primary data source due to its extensive coverage of peer-reviewed literature, particularly in recent years (Block & Fisch, 2020; Mongeon & Paul-Hus, 2016). Scopus offers a comprehensive collection of scholarly publications across various disciplines, making it particularly suitable for interdisciplinary

research, including educational professional development (Falagas et al., 2008). Furthermore, Scopus provides coverage that is 20% more extensive over a period than Web of Science, which is a commonly used database in bibliometric analysis. The extended coverage offers a benefit when carrying out evolution and citation analysis (del Río-Rama et al., 2020). In addition, Scopus enables the direct export of data in a format that is compatible with most of the software utilized for bibliometric analysis.

DATA COLLECTION

The search technique was meticulously crafted to acquire pertinent material while ensuring specificity. The search query used was:

TITLE-ABS-KEY ("professional development" OR "professional learning") AND TITLE-ABS-KEY ("middle leader*" OR "teacher leader*" OR "educational leader*"). After compiling 1700 articles, the query string was revised to focus on the search terms "professional development" OR "professional learning" for middle leaders in the educational field. This process yielded 525 relevant results, after which only research articles in English were included, and article reviews were excluded. The refined search string consisted of 287 articles for bibliometric analysis. The objective of this enhanced search method was to concentrate on top-notch, peer-reviewed studies while including a diverse range of professional development in educational leadership. To guarantee the pertinence and excellence of the data, several filters were employed:

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	Between 2010-2024	< 2010
Literature type	Journal (Article)	Conference, Book, Review
Publication Stage	Final	In Press
Subject Area	Restricted to Social Sciences, Psychology, and Business, Management, and Accounting for Education studies	Besides Education

Table 1 : The selection criterion in Searching

DATA ANALYSIS

The bibliometric research was conducted using VOSviewer (version 1.6.18), a software tool widely recognized for its ability to visualize and analyze large bibliometric networks (Van Eck & Waltman, 2014). VOSviewer allows for the creation of various types of bibliometric maps, including co-citation, bibliographic coupling, and co-occurrence networks. The analysis advanced through various stages:

- The Descriptive Analysis stage involves a comprehensive examination of publication patterns, including an evaluation of the annual publication output, identification of the countries that contribute the most, and recognition of the top institutions in terms of their scholarly output.
- Journal Analysis: Identifying the prominent journals in the field by analyzing the number of publications and citations they have received.
- Author Analysis: A thorough examination of the most notable authors based on their number of publications and the impact of their citations.

Co-citation Analysis is a technique employed to investigate the conceptual structure of a particular subject by analyzing the references that are frequently cited together (Small, 1973). Keyword co-occurrence analysis is the examination of the connection between keywords to comprehend the conceptual framework and evolution of themes within a research topic. Callon et al. introduced this method in 1983. Bibliographic coupling is the

examination of the level of association between publications based on their shared references. This analysis facilitates the acquisition of knowledge in previously unexplored research domains. Kessler introduced the concept in 1963. Utilising diverse bibliometric methodologies enables a thorough comprehension of the subject, encompassing both established knowledge bases and emerging research trends for middle leaders in education.

Visualisation and interpretation

The VOSviewer clustering method was employed to construct network visualisations. This methodology categorises nodes into groups according to their degree of interconnectedness (Van Eck & Waltman, 2014). The visualizations were subjected to a comprehensive analysis in order to emphasize significant themes, identify areas where research is insufficient, and identify potential future directions in the field of professional development for educational middle leaders. Thus, VOSviewer uses this index to organize objects on a map by minimizing the overall sum of squared distances between all pairs of items. Appio et al. (2016) utilised the LinLog/modularity normalisation method, as mentioned in their study.

Furthermore, the data set was examined utilizing VOSviewer, a tool designed for visualizing data. This study unveiled patterns through mathematical correlations and facilitated additional analyses, including keyword co-occurrence, citation analysis, and co-citation analysis. Keyword co-occurrence analysis can be employed to study the progression of a research field throughout time (Zhao et al., 2018).

The efficacy of this method in identifying trending topics across various fields has been demonstrated (Li et al., 2016). Citation analysis is an invaluable tool for identifying significant research topics, trends, and methodologies, as well as exploring the historical importance of a discipline's main area of focus (Allahverdiyev & Yucesoy, 2017). *Document co-citation analysis* is a frequently employed bibliometric technique that utilises network theory to identify the important structure of data. The outcomes of this study are directly impacted by the map and depend on the pioneering research conducted by Appio et al. (2016), Fahimnia et al. (2015), and L. Liu et al. (2015).

Restrictions

While bibliometric analysis offers valuable insights into research trends and patterns, it is important to acknowledge its limitations. Depending on citation data, the impact of recent publications or those in emerging subfields may be underestimated (Worrall & Cohn, 2023). In addition, the focus on Scopus-indexed papers may need to pay more attention to relevant literature from other databases or non-indexed sources (Cortegiani et al., 2020; Umate et al., 2019). These limitations were taken into account during the analysis of the results to ensure an unbiased perspective of the research field. This methodological approach aims to provide a comprehensive and accurate analysis of the current state and progress of research on professional development for middle leaders in education. Its purpose is to lay the groundwork for future research trajectories and practical implementations in the field.

RESEARCH FINDINGS AND DISCUSSIONS

The study of middle leaders in the field of education has received significant attention as a crucial area for scholarly research, reflecting the complex nature of educational leadership in the modern era. This bibliometric analysis investigates research patterns between 2014 and 2023, highlighting the growing acknowledgment of the crucial role played by middle leaders in education. The analysis also reveals geographical disparities in research output, with the United States, the United Kingdom, and Australia emerging as leaders in scholarly contributions (Hallinger & Kulophas, 2022; Hallinger & Heck, 2010). Thematic analysis reveals a noticeable trend toward holistic development strategies that include leadership skills, psychological well-being, and decision-making based on data (Day et al., 2016; Grootenboer et al., 2015; Wang & Li, 2019). The research trajectory demonstrates a keen awareness and adaptability to worldwide challenges, as evidenced by a significant increase in publications during the COVID-19 pandemic (Smith & Riley, 2012). This comprehensive review synthesizes important findings from various journals, highlighting the complex nature of middle leadership and the urgent

need for customized, flexible professional development strategies in an increasingly complex educational environment (Kennedy, 2016; Leithwood et al., 2020).

Research Trends in Professional Development for Middle Leader Teams

The changing focus of academic research in the area of professional development for middle leaders was demonstrated by an examination of research trends from 2014 to 2023, which revealed substantial changes. There was a consistent uptick in publications from 2014 to 2016, showing that middle leaders' importance in schools is being more acknowledged. During this time, there was likely a growing curiosity about how best to provide these leaders with the knowledge and abilities they needed to manage and lead their organizations.

The number of publications remained constant and peaked in 2020, continuing a steady and progressive rise in research output from 2017 to 2020. This pattern lines up with the fact that educational settings are getting more complicated and that middle leaders are now responsible for handling new problems like technological developments and regulatory shifts (Lipscombe et al., 2021, 2023; Nobile et al., 2024). Rising demands in 2020 were brought to light by the COVID-19 pandemic, which demonstrated the significance of effective leadership at all levels, especially in the face of unprecedented disruptions. Figure 1 is a graph showing the evolution of studies on middle leadership professional development over time.

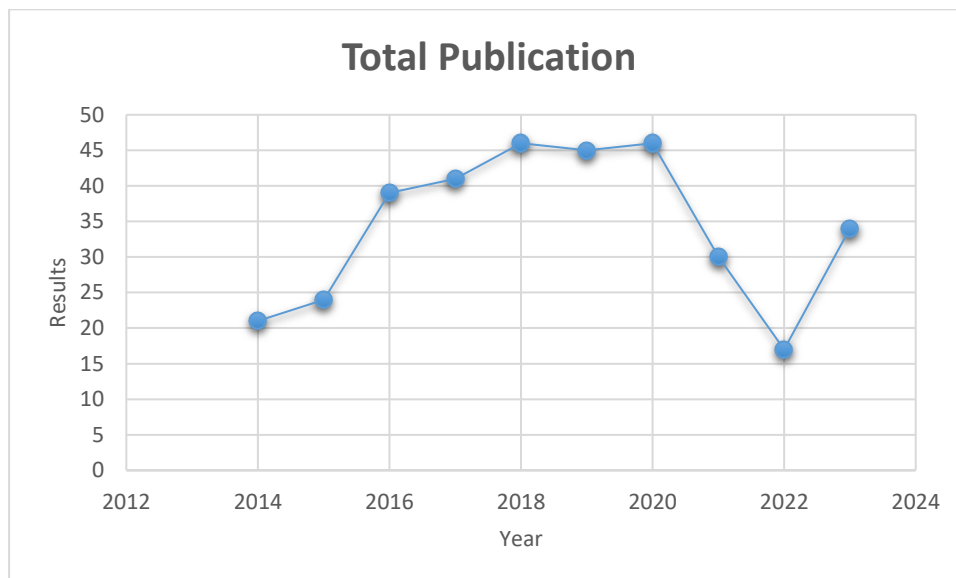


Figure 1 : Trend of research on professional development for middle leader by years

Year	Total Publication
2023	34
2022	17
2021	30
2020	46
2019	45
2018	46
2017	41
2016	39
2015	24
2014	21

Table 2 : Trend of Research on Professional Development by years

However, the subsequent decline in 2021, followed by a resurgence in 2023, suggests a dynamic and constantly evolving research landscape. The decrease can be ascribed to a temporary shift in academic preferences or the

impact of global disruptions on research endeavors. The renewed interest in 2023 underscores the ongoing significance of examining professional development for middle leaders (Lipscombe et al., 2020). The interest in this matter is motivated by persistent challenges and the requirement for competent leadership in an ever-changing educational environment. This pattern highlights the continuous significance of middle leadership in shaping educational outcomes.

Main Contributors in Professional Development for Middle Leader Teams: Journals, Authors, Countries, and Documents

An analysis of research sources on the professional development of middle leaders in education reveals a concentration on leadership and management as evidenced in multiple journals. Smith and Riley (2012) highlight the significant importance of School Leadership and Management in advancing the discussion on leadership in educational settings, particularly in the middle leadership tier. This journal has published 10 influential articles on the subject. Kennedy (2016) emphasises the specific emphasis of the Professional Development in Education journal, which consists of seven publications, on the ongoing improvement and enhancement of skills for educators in leadership positions. These citations emphasise the importance of continuous professional development for middle leaders to successfully handle the intricacies of their positions (Z. Liu et al., 2021; Meyers et al., 2024; Taylor et al., 2019; Zepeda, 2019). Furthermore, the scholarly focus on the structural and administrative components of educational leadership is evident in the publications of Educational Management Administration and Leadership and Teachers College Record, both of which contain five articles. Publications like Frontiers in Psychology and Journal of Educational Administration demonstrate an interdisciplinary approach by combining psychological knowledge with educational leadership, emphasising the complex nature of middle leadership positions (Day et al., 2011, 2020; Meyers et al., 2024). The wide array of sources, ranging from specialised educational journals to those that cover broader aspects of leadership and psychology, illustrates the intricate and ever-changing nature of research in this field. This highlights the importance of taking a comprehensive approach to developing effective middle leaders in education. The following are the most influential scholarly articles for enhancing professional growth in the field of education.

Source Title	No.Publication
School Leadership And Management	10
Professional Development In Education	7
Educational Management Administration And Leadership	5
Teachers College Record	5
Frontiers In Psychology	4
Journal Of Educational Administration	4
International Journal Of Educational Management	3
International Journal Of Leadership In Education	3
International Journal Of Mentoring And Coaching In Education	3
Education Sciences	2
Educational Management Administration Leadership	2
Educational Research	2
Educational Technology Research And Development	2

International Journal Of Educational Research	2
International Journal Of Learning	2

Table 3 Professional Development Sources for Middle Leader



Figure 2 Professional Development Sources for Middle Leader

Author

The analysis of scholars who have contributed to the research on professional development for middle leaders in education reveals a concentration of influence among a specific group of academics. P. Grootenboer's significant publication record, consisting of eight works, highlights his considerable impact on the field, particularly in the areas of practice theory and the involvement of middle leaders in educational transformation (Edwards-Groves et al., 2023; Grootenboer et al., 2023). Presented here is a submission from an author regarding professional growth for the middle leadership team in the field of education. C. Edwards-Groves has authored seven publications, frequently collaborating with Grootenboer, which suggests a mutual scholarly focus on the practical elements of educational leadership. M.R. Bleich's six publications position her as an influential individual, potentially providing valuable perspectives from a healthcare leadership standpoint due to her expertise in nursing education (Bleich, 2018). Furthermore, D.A. Bryant, K. Rönnerman, and S. Tindall-Ford, each having published four times, demonstrate a broad interest in the practical and theoretical intricacies of middle leadership in various educational environments.

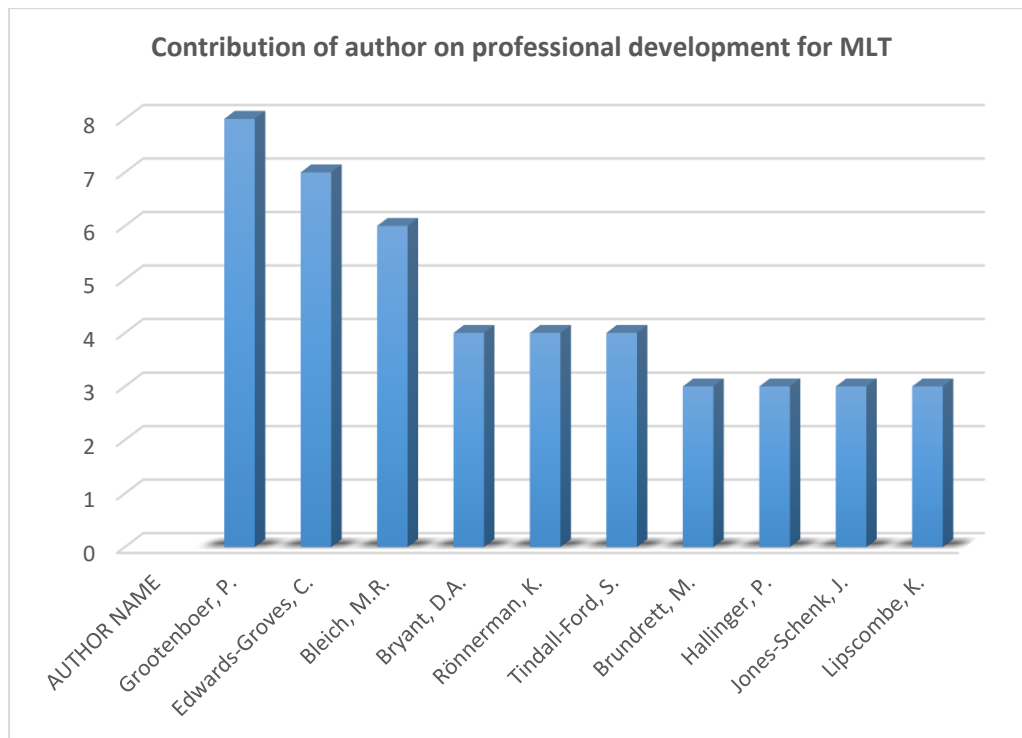


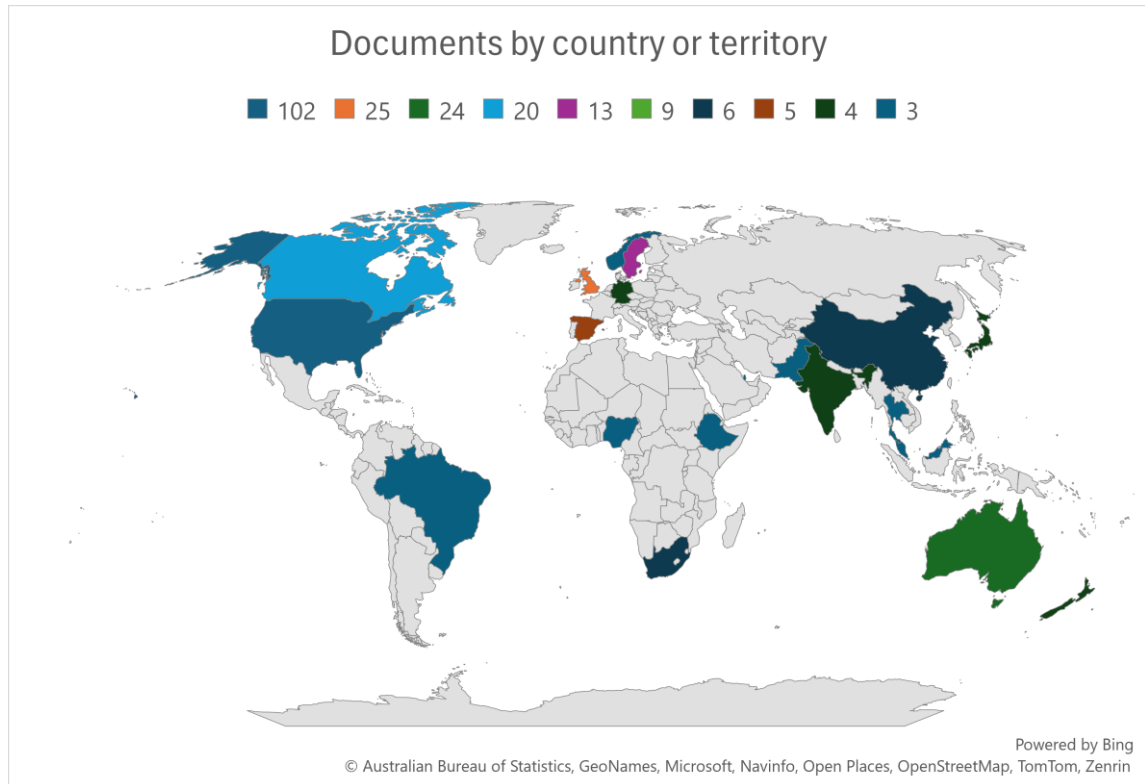
Figure 3 Contribution of top author in Professional Development

In addition, the research landscape is enriched by the contributions of M. Brundrett, P. Hallinger, and other scholars, who have each published three works. These publications offer a range of perspectives on leadership development. Significantly, Hallinger's participation is remarkable because of his extensive research on leadership in educational change (Hallinger & Kulophas, 2022; Hallinger, 2011). The distribution of authors indicates a dynamic and cooperative research community where influential scholars have played a significant role in shaping the discussion on professional development for middle leaders in education.

Analysing research on professional development for middle leaders by country/territory.

The research on professional development for middle leaders in education is unevenly distributed across different regions, as evidenced by the varying number of publications. The United States dominates with a significant margin, having 102 publications, highlighting its crucial contribution to the advancement of educational leadership research. The country's dominance in educational research can be attributed to its well-established institutions and the strong focus on leadership as a crucial factor in driving educational reform (Hallinger & Heck, 2010). The United Kingdom and Australia have 25 and 24 publications, respectively, demonstrating a significant focus on the professional growth of middle leaders in their educational systems.

Canada, Sweden, and Hong Kong are significant contributors to this research field, with 20, 13, and 9 publications, respectively. The data indicates a focused endeavor in these areas to investigate and cultivate middle leadership positions, most likely motivated by the requirement for competent leadership in educational systems that are becoming more decentralized (Bush, 2018). China and South Africa, each with six publications, are emerging as significant contributors in the field of educational leadership in non-Western contexts, indicating a rising academic interest. Figure 4 below depicts a document categorised by country.



.Figure 4 Document Specific to a Country

Regarding Malaysia, a country with three publications, the research environment is slowly growing. The inclusion of Malaysia in this dataset signifies an increasing acknowledgment of the significance of middle leadership within its educational system, especially as the country persists in reforming its educational policies to better conform to international benchmarks (Aziz, 2021). This growing field of study may concentrate on the distinct difficulties encountered by middle managers in navigating Malaysia's diverse educational environment, where cultural, linguistic, and socio-economic factors have a substantial impact on leadership practices.

Citation of the document

The current literature on the professional development (PD) of middle leaders in education has highlighted the intricate and diverse nature of their roles, emphasising the crucial requirement for tailored PD programs. The study conducted by Ready, Hill, and Conger (2008) has highlighted the strategic importance of leadership development in talent management, a concept that is equally applicable in the field of education.

Marsh, Bertrand, and Huguet (2015) emphasised the crucial significance of data literacy and the involvement of professional learning communities. They suggested that middle leaders should actively promote collaborative environments to stimulate instructional improvements. Grootenboer, Edwards-Groves, and Rönnerman (2015) have focused on the complex difficulties faced by middle leaders, advocating for professional development strategies that provide them with the knowledge and skills to successfully manage the competing demands of higher-level directives and the practical requirements of teachers. Jones and Dexter (2014) have highlighted the crucial importance of middle leaders in facilitating varied learning processes within their teams. In addition, Hallinger and Liu (2016) have provided valuable perspectives on the difficulties related to fairness and efficiency in diverse educational environments, while Edwards-Groves, Grootenboer, and Ronnerman (2016) have emphasised the importance of fostering trustful relationships for successful school-based action research.

Edwards-Groves et al. (2019) have emphasised the capacity of middle leaders to promote educational development at the school level and have suggested professional development programs that aim to empower them to lead improvements across the entire school. Collectively, these studies emphasise the importance of

comprehensive professional development programs to enhance the effectiveness of middle leaders in various educational settings. Table 4 displays the leading authors whose journals have garnered the highest number of citations.

No.	Document Title	Authors	Source	Year	Citations
1	Winning the race for talent in emerging markets	Ready, D.A., Hill, L.A., Conger, J.A.	Harvard Business Review, 86(11)	2008	104
2	Using data to alter instructional practice: The mediating role of coaches and professional learning communities	Marsh, J.A., Bertrand, M., Huguet, A.	Teachers College Record, 117(4), pp. 1–40	2015	99
3	Leading practice development: voices from the middle	Grootenboer, P., Edwards-Groves, C., Rönnerman, K.	Professional Development in Education, 41(3), pp. 508–526	2015	89
4	How teachers learn: The roles of formal, informal, and independent learning	Jones, W.M., Dexter, S.	Educational Technology Research and Development, 62(3), pp. 367–384	2014	89
5	Leadership and teacher learning in urban and rural schools in China: Meeting the dual challenges of equity and effectiveness	Hallinger, P., Liu, S.	International Journal of Educational Development, 51, pp. 163–173	2016	68
6	Facilitating a culture of relational trust in school-based action research: Recognising the role of middle leaders	Edwards-Groves, C., Grootenboer, P., Ronnerman, K.	Educational Action Research, 24(3), pp. 369–386	2016	62
7	We don't need another hero	Badaracco Jr., J.L.	Harvard Business Review, 79(8)	2001	61
8	'Scaling-up is a craft not a science': Catalysing scale-up of health innovations in Ethiopia, India and Nigeria	Spicer, N., Bhattacharya, D., Dimka, R., ... Walt, G., Wickremasinghe, D.	Social Science and Medicine, 121, pp. 30–38	2014	60
9	New opportunities for principal leadership: Shaping school climates for enhanced teacher development	Ellie, D.-S.	Teachers College Record, 114(3), 030306	2012	60

10	School middle leadership: systematic review	Lipscombe, K., Tindall-Ford, S., Lamanna, J.	Educational Management Administration and Leadership, 51(2), pp. 270–288	2023	59
11	Employee-oriented leadership and quality of working life: Mediating roles of idiosyncratic deals	Hornung, S., Glaser, J., Rousseau, D.M., Angerer, P., Weigl, M.	Psychological Reports, 108(1), pp. 59–74	2011	59
12	Analyzing Educational Policies: A Learning Design Perspective	Cobb, P., Jackson, K.	Journal of the Learning Sciences, 21(4), pp. 487–521	2012	58
13	Investigating the development of mathematics leaders' capacity to support teachers' learning on a large scale	Jackson, K., Cobb, P., Wilson, J., ... Dunlap, C., Appelgate, M.	ZDM Mathematics Education, 47(1), pp. 93–104	2015	51
14	Driving change from 'the middle': middle leading for site-based educational development	Edwards-Groves, C., Grootenboer, P., Hardy, I., Rönnerman, K.	School Leadership and Management, 39(3-4), pp. 315–333	2019	41

Table 4 Top Author Journal Citations

Themes and Evolving Trends in Professional Development for Middle Leader Teams

The image below depicts an intricate network of interrelated concepts, with "theme" serving as the central node that links different aspects of professional development. Distinct groups of related elements become apparent in relation to professional factors, research and practice, and obstacles to carrying out a plan or idea.

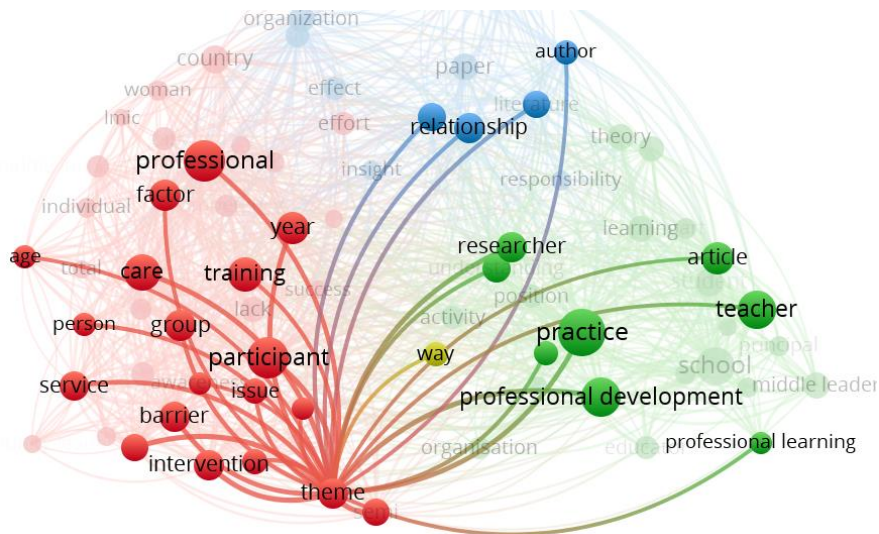


Figure 5 displays the outcomes of the themes related to the evolving trend in professional development.

environments. This visualization highlights the holistic aspect of middle leadership, emphasizing the integration of leadership abilities, mental health, and educational administration in their professional growth. The text highlights a primary emphasis on leadership in both human and educational settings, specifically delving into the experiences of middle leaders and the psychological aspects of their roles (Kuntz et al., 2022).

Figure 6 below illustrates the detailed analysis that explores the thematic findings in the visualisation. It provides a comprehensive and evaluative discussion of each theme, including an assessment of their strengths and limitations.

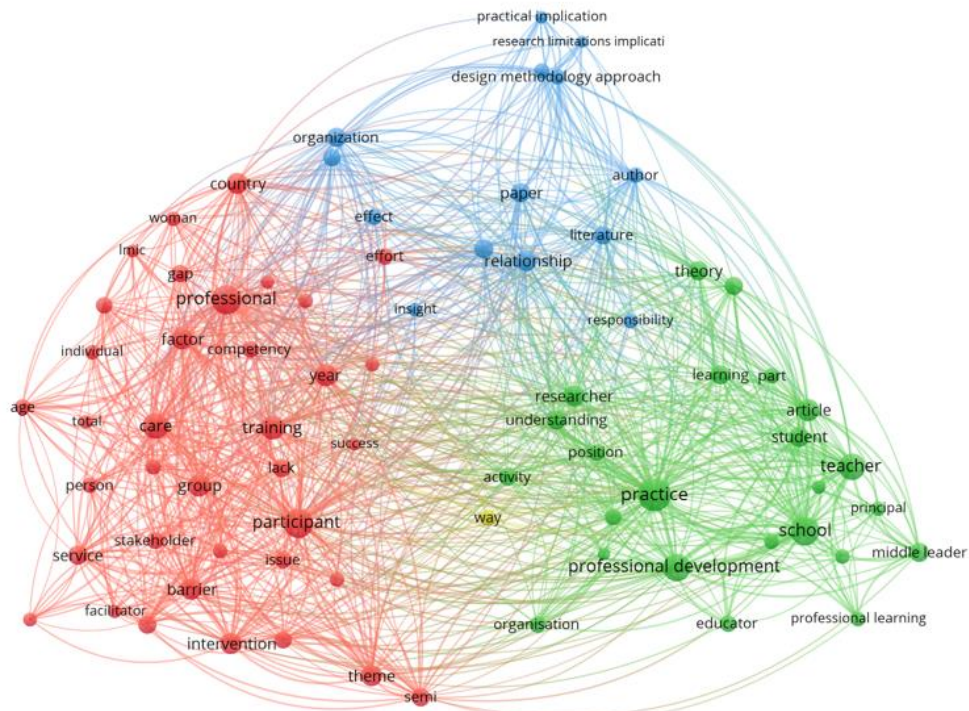


Figure 6 illustrates the subsequent analysis of the thematic findings.

a) Red Cluster: Individuals and Factors

This thematic focus centers on the influence of individual and personal factors on career progression, specifically in educational settings. The key constituents include the terms "professional," "individual," "participant," "group," "woman," and "age." The person-centered methodology is highly effective in recognizing the importance of individual differences in professional development, in line with literature that highlights the essential nature of customized learning experiences (Desimone & Garet, 2015). In addition, the intentional incorporation of categories such as "woman" and "age" highlights the thematic focus on demographic aspects, which are important for promoting fair professional advancement (Beatty, 2000). The term "group" recognises the importance of collaborative learning processes in educational environments (Vangrieken et al., 2017).

Nevertheless, limitations accompany this approach, including the potential for oversimplification of intricate issues and the perpetuation of stereotypes. A myopic emphasis on individual traits may inadvertently disregard the structural and organizational implications on professional development (Opfer & Pedder, 2011). Furthermore, an excessive focus on demographic variables within professional development sans adequate contextualization may invite unwarranted generalizations or the reinforcement of stereotypes (Lumby & Coleman, 2007).

b) Green Cluster: Education Professional Development and Advancement

This group focuses on the practical aspects of enhancing one's expertise and knowledge in the field of education, specifically related to professional development. The core elements include "praxis," "career development," "pedagogue," "educational establishment," and "intermediate administration." The emphasis on practice-based learning is intended to prioritise the integration of practical experience with research, with a particular focus on job-embedded professional learning (Darling-Hammond et al., 2017). Moreover, the incorporation of distinct positions such as "educator" and "middle management" implies the adoption of customised strategies for professional development, ultimately resulting in enhanced efficiency (Harris & Jones, 2019). The term "contextual significance" emphasises the importance of the phrase "educational institution" within the setting where professional development is carried out (Leithwood, 2016). However, professional development is hindered by specific constraints. Overemphasising practical application while neglecting theoretical knowledge can result in underestimating the importance of theoretical foundations, which are essential for achieving a thorough understanding (Korthagen, 2017). The risk of a silo mentality arises when there is an excessive emphasis on roles, such as middle management, which may lead to a disregard for the interdependence of different levels of leadership in educational institutions (Bush, 2019).

c) Blue Cluster - Research and Approach

This cluster centers on the academic and exploratory aspects of professional development, including elements such as "document," "writer," "investigator," and "methodology for designing." Using a methodology based on empirical evidence: This cluster highlights the importance of research in guiding professional development practices, which is in line with the need for evidence-based education (Cordingley, 2015).

Methodological discipline refers to the level of precision and strictness with which a research study is carried out. It requires following established procedures and protocols to guarantee the accuracy and dependability of the outcomes. The focus on study design demonstrates a commitment to ensuring the high quality and reliability of research conducted in this field (Desimone, 2009; 2021).

The integration of theoretical concepts with practical application is facilitated by the interconnection between research and other clusters. This suggests the potential to transform academic discoveries into tangible implementations (Timperley, 2011).

Nevertheless, there may be a significant discrepancy between academic research and its real-world implementation. Insufficient distribution of research findings can lead to a lack of connection with practical application in the real world (Vanderlinde & van Braak, 2010). Methodological limitations refer to the restrictions that arise from relying too heavily on research procedures, which can narrow the range of investigations conducted in professional development studies (Opfer & Pedder, 2011).

The three clusters provide a comprehensive framework for comprehending professional development in the field of education. This framework includes discrete elements, pragmatic application, and the fundamental basis of investigation. This comprehensive viewpoint is consistent with current beliefs about successful professional development, highlighting the interaction among personal, organizational, and systemic elements (Opfer & Pedder, 2011). However, dividing these elements into separate clusters may create artificial divisions in what is essentially a connected process. In order for professional development to have a significant effect, it must address the specific requirements of individuals, provide practical approaches for applying acquired knowledge, and be based on research-backed strategies (Darling-Hammond et al., 2017). An advantage of this model is its recognition of the complex nature of professional development, particularly for middle leaders in the field of education. The text emphasizes the significance of customized approaches (red cluster), practical usability (green cluster), and empirically supported principles (blue cluster). This aligns with the demand for inclusive and thorough professional development initiatives that take into account specific situations and environments (Leithwood, 2016; Harris & Jones, 2019). An inherent constraint of this model is the possibility of excessively prioritizing one cluster while neglecting others. An unbalanced approach to professional development may result from excessively focusing on individual variables without considering organizational contexts or prioritizing research methodology without adequately addressing practical application. In the future, research and practice in professional development for middle leaders should aim to achieve a higher level of integration among these clusters. This may entail the creation of research studies that concurrently tackle individual requirements,

pragmatic obstacles, and theoretical underpinnings while also investigating the effective implementation of findings in various educational environments.

DISCUSSIONS

A review of academic literature that centers on the advancement of middle leaders in the education field between 2014 and 2023 reveals a research landscape that is continuously changing. There has been a clear change in academic emphasis during this time, which reflects the evolving requirements and intricacies of educational leadership (Smith & Riley, 2012). During the years 2014-2016, there was a consistent rise in publications, which demonstrated an increasing acknowledgment of the crucial role middle leaders play. This increasing pattern reached its peak in 2020, primarily due to the exceptional difficulties caused by the COVID-19 pandemic, highlighting the pressing requirement for strong and adaptable leadership at every level.

Furthermore, the subsequent decrease in 2021 and the resurgence in 2023 indicate a flexible research environment that is able to address global disruptions while still prioritizing this crucial field effectively. An extensive examination of research sources highlights the importance of using a multidisciplinary approach when studying the development of middle leadership. Significant contributions to the advancement of leadership discourse in educational contexts have been made by influential journals such as *School Leadership and Management* and *Professional Development in Education* (Kennedy, 2016). In addition, the fact that publications from psychology-focused journals such as *Frontiers in Psychology* are being included indicates a growing acknowledgment of the psychological aspects of leadership positions. This highlights the importance of taking a comprehensive approach to the development of middle leaders (Day et al., 2011).

The United States has the highest number of publications, with 102, followed by the United Kingdom and Australia, with 25 and 24 publications, respectively, in terms of geographical distribution. The distribution of educational research institutions is influenced by both the concentration of these institutions and the different priorities placed on leadership as a catalyst for educational reform in different countries (Lipscombe et al., 2021; Hallinger & Heck, 2010). Moreover, the increasing involvement of countries like Malaysia, as demonstrated by three published works, suggests a rising worldwide concern for middle leadership, especially in varied educational settings (Adam, 2023; Beram et al., 2021; Rozali Din, 2021).

The thematic analysis, as demonstrated by the keyword co-occurrence network, reveals the interrelatedness of research themes in this field. The visualization displays clearly defined clusters of focus specifically related to leadership training, psychological aspects, and qualitative research methodologies. The multifaceted approach highlights the complex nature of middle leadership roles. It emphasizes the need for comprehensive professional development programs that not only focus on leadership skills but also address psychological well-being and decision-making processes in educational settings (Zamani Ibrahim et al., 2019). The following text examines the evolving field of research on the development of middle leadership over ten years. It amalgamates trends from multiple countries and identifies significant clusters of themes, offering a macro-level perspective that links localized studies with global patterns. Furthermore, it investigates the impact of global occurrences, such as the COVID-19 pandemic, on the objectives of research in educational leadership (Harris & Jones, 2020). The references cited are Grootenboer et al., 2015 and Jones & Dexter, 2014.

An in-depth evaluation of the literature reveals several crucial domains that require further investigation and advancement. Although the current body of research offers valuable insights into the difficulties and approaches related to the advancement of middle leaders, it is clear that additional investigation is necessary, specifically in comprehending the influence of digital leadership and global educational settings. Furthermore, the significant presence of barriers and challenges in the thematic analysis indicates a requirement for increased focus on surmounting obstacles in the execution of efficient professional development programs (Avalos, 2011). Future research should focus on exploring novel methods for developing leadership skills that incorporate technological advancements and address the changing global educational landscape. This will ensure that middle leaders are well-prepared to navigate the complexities of modern educational environments.

The bibliographic review of professional development for middle leaders in education offers valuable insights and guidance for future research. It also makes a unique contribution to the field and acknowledges specific limitations.

Implications and areas for further research

This study highlights the need for policymakers and educational leaders to develop more complex and tailored professional development programs for middle leaders. The disparities in research output among various geographical regions suggest that the implementation of leadership development models in educational systems requires careful and thorough adaptation (Hallinger & Liu, 2016). It is recommended that future research focuses on conducting longitudinal studies to assess the long-lasting impacts of various professional development strategies on the effectiveness of middle leaders and student outcomes. Moreover, it is essential to examine the intersection between digital leadership skills and traditional leadership competencies in light of the rapid technological advancements in education (Dexter & Richardson, 2020).

This study provides a comprehensive and in-depth analysis of the evolving field of research on the development of middle leadership over ten years. This analysis offers a unique macro-level perspective by combining trends from various countries and identifying significant theme clusters. It establishes a connection between localized studies and global patterns. Analyzing the publication trends in response to global events, such as the COVID-19 pandemic, allows us to understand how external factors impact the research objectives in the field of educational leadership (Harris & Jones, 2020).

While this bibliometric technique offers valuable insights, it also possesses inherent limitations. Exclusively, depending on published academic literature, it may only partially encompass the current practical advancements in leadership development. The dataset's focus on English-language publications may lead to an insufficient portrayal of contributions from countries where English is not the dominant language. Furthermore, the analysis conducted using keywords, while it does reveal overarching themes, may not encompass in-depth discussions within individual studies (Zupic & Čater, 2015).

This research provides a foundation for conducting more targeted investigations into the effectiveness of methods for cultivating middle leadership. Collaboration among researchers, policymakers, and practitioners is essential to ensure that professional development programs align with the changing demands of educational leadership roles. Future research should prioritize addressing the identified geographical and topic deficiencies. This can be accomplished by conducting comparative analyses and employing mixed-methods techniques that combine bibliometric data with qualitative insights from middle leaders who are actively engaged in the field.

CONCLUSION

A comprehensive review of professional development for middle leaders in the education sector reveals its complex and constantly evolving characteristics, which have significant consequences for educational leadership and organizational effectiveness. Several significant conclusions arise from this research synthesis:

Firstly, the dynamic nature of middle leadership positions requires ongoing and flexible approaches to professional growth. Middle leaders must adeptly navigate the complex space that exists between senior management and front-line educators, necessitating a distinct set of skills that blend strategic thinking with practical implementation (Fitzsimons, 2021). The changing trends in research during the last ten years demonstrate how the field has adapted to new challenges. This is particularly evident in the significant increase in publications during the COVID-19 pandemic, which emphasizes the crucial role of middle leaders in managing crises and maintaining organizational resilience.

Moreover, the disparities in research productivity among various geographical regions offer both advantages and difficulties. Although the United States, the United Kingdom, and Australia make the most significant contributions, valuable insights into culturally nuanced leadership practices can be gained from emerging perspectives in diverse educational contexts like Malaysia and South Africa. The widespread distribution of research worldwide emphasizes the need for professional development models that are tailored to specific contexts and take into account different educational systems and cultural paradigms.

In addition, the thematic analysis suggests a move towards holistic development strategies that incorporate leadership abilities, mental health, and data-informed decision-making. This comprehensive approach aligns with the claim that sustainable leadership development should include individual, organizational, and systemic elements. The high occurrence of barriers and difficulties in the literature highlights the importance of cultivating resilience and flexible strategies in professional development programs.

In summary, while progress has been made in understanding and improving the professional growth of middle leaders in education, there are still several areas that need further research. Future research should focus on examining the impact of digital technologies on leadership practices, evaluating the long-term effectiveness of various professional development models, and developing strategies to promote inclusive leadership in increasingly diverse educational settings. Additionally, it is important to investigate how middle leaders can contribute meaningfully to systemic change and educational reform.

The evolving nature of educational leadership requires continuous improvement in professional development approaches for middle leaders. To enhance the ability of middle leaders to make positive changes and improve educational outcomes in diverse global contexts, educators and policymakers can address the identified gaps and make use of the extensive body of existing research.

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