

## MAPPING ENTREPRENEURIAL LEADERSHIP OF SCHOOL PRINCIPALS RESEARCH: A BIBLIOMETRIC ANALYSIS

Alberthin Gabriela Reskir<sup>1a\*</sup>, Tanwey G. Ratumanan<sup>2b</sup>, and Paul Arjanto<sup>3c</sup>

<sup>1-3</sup> Master of Educational Management, Postgraduate Program, Pattimura University, Ambon, Indonesia

<sup>a</sup>E-mail: [greskir552@gmail.com](mailto:greskir552@gmail.com)

(\*) Corresponding Author  
[greskir552@gmail.com](mailto:greskir552@gmail.com)

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### ABSTRACT

This study aims to map the development, geographical distribution, collaboration patterns, and thematic structure of research on entrepreneurial leadership of school principals. A bibliometric method was employed using metadata retrieved from the Scopus database and screened through the PRISMA 2020 procedure. From 397 initial records, 59 English-language articles and reviews published between 2014 and 2026 were included in the final analysis. The data were analyzed using performance analysis and science-mapping techniques, including annual scientific production, source productivity, country scientific production, international collaboration, author keywords, keyword co-occurrence, thematic mapping, and trend topics. The findings show that research on entrepreneurial leadership of school principals has grown unevenly but progressively, with publication peaks in 2018, 2020, and 2024. Frontiers in Education and the International Journal of Educational Management were among the most productive sources. Indonesia, Australia, Malaysia, South Africa, Cyprus, Hong Kong, Finland, the United States, and the United Kingdom occupied visible positions in country productivity, although international collaboration remained limited. The keyword and thematic analyses indicate that school principals, entrepreneurial leadership, school leaders, school leadership, entrepreneurship education, innovation, entrepreneurial competence, and educational management form the conceptual core of the field. The study implies that entrepreneurial leadership should be understood not merely as business-oriented leadership, but as a strategic capacity of school principals to mobilize resources, promote innovation, and create educational value under conditions of uncertainty and institutional constraint.

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### INTRODUCTION

Entrepreneurial leadership has become an increasingly relevant concept in educational management, as contemporary schools are required to respond to policy reform, resource constraints, school autonomy, digital transformation, community expectations, and the growing demand for innovation. In this context, school principals

are no longer positioned merely as administrative managers. They are increasingly expected to function as opportunity seekers, resource mobilizers, innovation facilitators, and strategic leaders who are able to strengthen school capacity. The notion of the principal as an entrepreneurial actor has been discussed in studies on school leadership, school autonomy, entrepreneurship education, and school development (Hörnqvist & Leffler, 2014; Yemini et al., 2015).

This topic is significant because entrepreneurial leadership in schools is closely associated with principals' capacity to foster innovation, manage uncertainty, build partnerships, and use limited resources creatively. Studies conducted in Malaysia, Indonesia, South Africa, Australia, and European contexts show that principals may enact entrepreneurial leadership through fundraising, school–industry collaboration, entrepreneurship education, teacher innovation, school–community engagement, and organizational improvement (Ariyani et al., 2021; Ghazali et al., 2022; Mamabolo, 2020; Pihie et al., 2014; Ruskovaara et al., 2016). These studies indicate that entrepreneurial leadership is not confined to commercial activity. Rather, it can be understood as a leadership orientation that enables principals to create educational value, support school development, and respond strategically to complex institutional environments.

At the same time, entrepreneurial leadership in schools remains a contested and context-dependent concept. In some settings, it is associated with school autonomy, innovation, professional agency, and educational improvement. In other settings, it is linked to marketization, performativity, competition, funding pressure, and the changing role of public education (Keddie et al., 2018; Larey, 2024; Rowe et al., 2025). This dual character makes the topic both theoretically and practically important. Entrepreneurial leadership may strengthen school resilience and creativity, but it may also reflect broader policy pressures that require principals to act as revenue generators or market-oriented managers.

Previous research has provided valuable empirical insights into entrepreneurial leadership behaviour, principal entrepreneurial competence, entrepreneurship education, school leadership in autonomous systems, and teacher entrepreneurial behaviour (Balasi et al., 2023; Demirbilek, 2024; Ho et al., 2024; Syafrudin et al., 2023). However, the literature remains dispersed across different terms, including entrepreneurial leadership, entrepreneurial school leadership, principal entrepreneurship, edupreneurial leadership, entrepreneurship education, intrapreneurial school culture, and social entrepreneurship. This conceptual dispersion makes bibliometric mapping necessary to identify how the field has developed, which sources and countries contribute most visibly, and which keywords and themes structure the literature.

This study addresses that need by conducting a bibliometric analysis of Scopus-indexed publications on entrepreneurial leadership of school principals. The study is guided by three research questions: (1) How has research on entrepreneurial leadership of school principals developed in terms of publication growth and source productivity? (2) What is the geographical distribution and international collaboration pattern in this research area? (3) What are the dominant, connected, and emerging themes in research on entrepreneurial leadership of school principals?

Unlike prior narrative and empirical studies that focus mainly on specific contexts, behaviours, or leadership outcomes, this study provides a comprehensive bibliometric mapping of entrepreneurial leadership of school principals. Its novelty lies in integrating performance indicators with science-mapping techniques to reveal publication trajectories, source distribution, geographic asymmetries, collaboration patterns, and conceptual developments in this emerging research domain.

## METHOD

This study used a bibliometric research design to map the development of research on entrepreneurial leadership of school principals. Bibliometric analysis was selected because it enables systematic examination of publication growth, source productivity, geographical distribution, collaboration patterns, and thematic structures within a defined scientific corpus. This approach is appropriate for identifying the intellectual and conceptual structure of a research field and for clarifying future research directions. The bibliometric procedure followed a performance-analysis and science-mapping logic using metadata exported from Scopus and processed through a bibliometric-oriented workflow (Aria & Cuccurullo, 2017).

The Scopus database was used as the data source because it provides structured bibliographic metadata, including titles, authors, abstracts, keywords, source titles, affiliations, document types, publication years, and references. The search was conducted using the TITLE-ABS-KEY field. The query combined three groups of terms: entrepreneurial leadership terms, school principal and school leadership terms, and school or educational context terms. The search string can be summarized as follows: TITLE-ABS-KEY (("entrepreneurial leadership" OR "entrepreneurial school leadership" OR "entrepreneurial principal\*" OR "principal entrepreneurial leadership") AND ("school principal\*" OR principal\* OR headmaster\* OR "head teacher\*" OR "school leader\*" OR "educational leader\*") AND (school\* OR education OR "educational institution\*" OR "primary school\*" OR "secondary school\*" OR "elementary school\*" OR "high school\*")).

The initial search produced 397 records. The study selection process was reported using the PRISMA 2020 flow structure to show how the final bibliometric dataset was obtained (Page et al., 2021). First, records were screened by document type, and only articles and reviews were retained. This excluded 118 records and left 279 reports. Second, the language was restricted to English, which excluded 16 reports and left 263 reports. Third, only final publication-stage documents were retained, excluding 6 records and leaving 257 reports for topical eligibility assessment. Fourth, titles, abstracts, and keywords were screened to retain documents directly related to entrepreneurial leadership, entrepreneurial competence, entrepreneurship, or entrepreneurial practices involving school principals, head teachers, school leaders, or school leadership contexts. This topical screening excluded 198 reports. The final dataset consisted of 59 documents.

The final dataset was analyzed using indicators commonly used in bibliometric studies. The analysis included main information about the dataset, annual scientific production, most relevant sources, country scientific production, country collaboration network, most frequent author keywords, keyword co-occurrence network, thematic map, and trend topics. Citation-based ranking of globally cited documents was not reported because the exported Scopus CSV file did not contain valid citation-count values in the Cited by column. Therefore, the article focuses on publication performance, geographical distribution, collaboration structure, and conceptual development rather than citation impact.

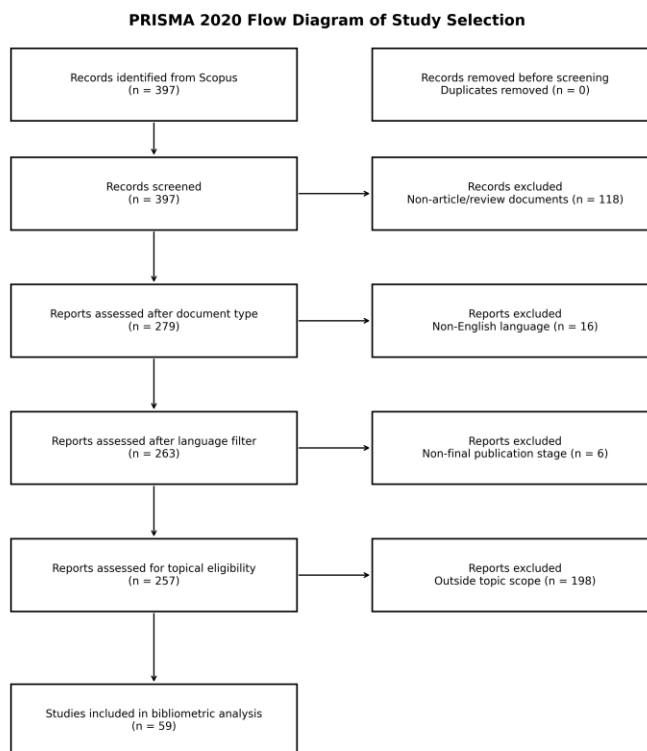


Figure 1. PRISMA 2020 flow diagram of the study selection process

## RESULT AND DISCUSSION

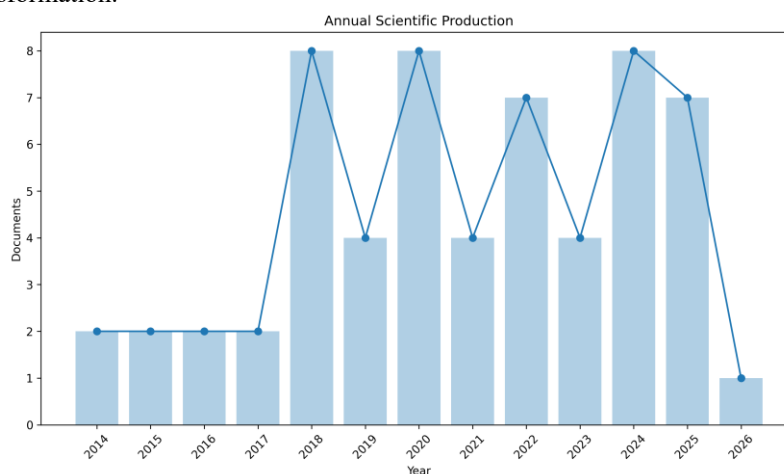
The final dataset consisted of 59 documents published between 2014 and 2026. Table 1 summarizes the main bibliometric information. The dataset included 45 sources, 150 authors, 7,127 references, and 219 author keywords. Most documents were articles, while reviews accounted for only two publications. The average number of co-authors per document was 2.92, while the international co-authorship rate was 13.56%. These indicators suggest that the field has developed as a relatively small but growing research area with moderate co-authorship and limited cross-country collaboration.

Table 1. Main information about the bibliometric dataset

Description	Results
Timespan	2014-2026
Sources	45
Documents	59
Annual growth rate %	12.06
References	7,127
Author's keywords	219
Authors	150
Single-authored documents	9
Co-authors per document	2.92
International co-authorships %	13.56
Document types	57 articles; 2 reviews

Source: Scopus CSV metadata processed using bibliometric analysis.

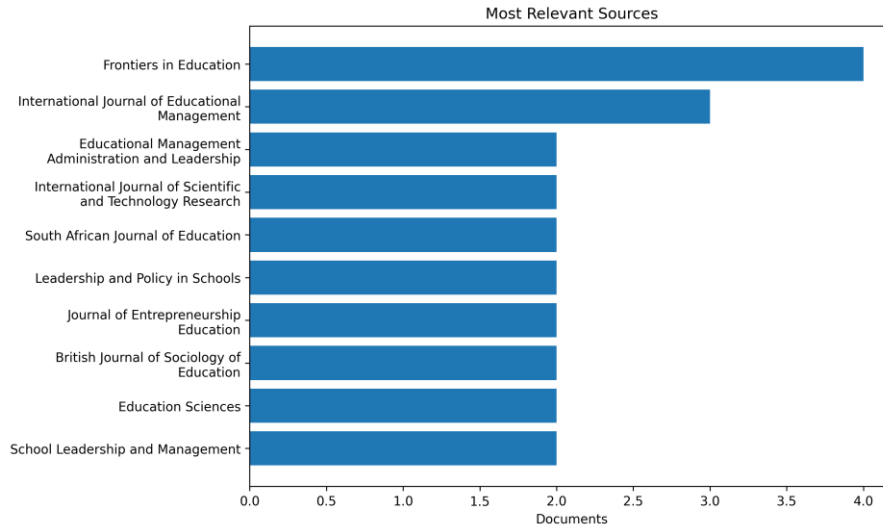
Figure 2 shows the annual scientific production. Publications began with two documents per year from 2014 to 2017, followed by a visible increase in 2018. The highest annual outputs occurred in 2018, 2020, and 2024, each with eight documents. The field remained active in 2022 and 2025, with seven documents in each year. The single document recorded in 2026 should be interpreted cautiously because the year was incomplete at the time of export. Overall, the pattern indicates that entrepreneurial leadership of school principals has become more visible since 2018, especially as school systems have faced stronger demands for innovation, school autonomy, resource mobilization, and educational transformation.



**Figure 2. Annual scientific production**

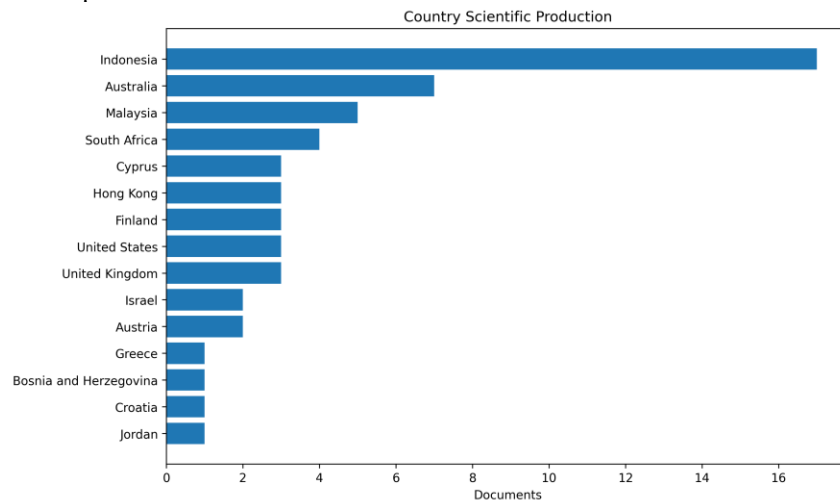
The growth pattern is consistent with the substantive development of the field. Earlier publications emphasized entrepreneurial attitude, entrepreneurial leadership behaviour, and the principal as entrepreneur (Hörnqvist & Leffler, 2014; Pihie et al., 2014; Yemini et al., 2015). Later studies expanded the discussion toward school autonomy, entrepreneurship education, funding, innovation, sustainable management, and teacher entrepreneurial behaviour (Ghazali et al., 2022; Ho et al., 2024; Keddie et al., 2018; Mavi et al., 2024). This indicates that the topic has moved from a narrow leadership-behaviour discussion toward a broader educational management issue involving institutional reform, school resources, and organizational innovation.

Figure 3 presents the most relevant sources. *Frontiers in Education* was the most productive outlet with four documents, followed by the *International Journal of Educational Management* with three documents. Several sources contributed two documents each, including *Educational Management Administration and Leadership*, *International Journal of Scientific and Technology Research*, *South African Journal of Education*, *Leadership and Policy in Schools*, *Journal of Entrepreneurship Education*, *British Journal of Sociology of Education*, *Education Sciences*, and *School Leadership and Management*. This distribution shows that the field is not concentrated in a single journal. Instead, it is distributed across educational leadership, educational management, entrepreneurship education, sociology of education, and policy-oriented outlets.



**Figure 3. Most relevant sources**

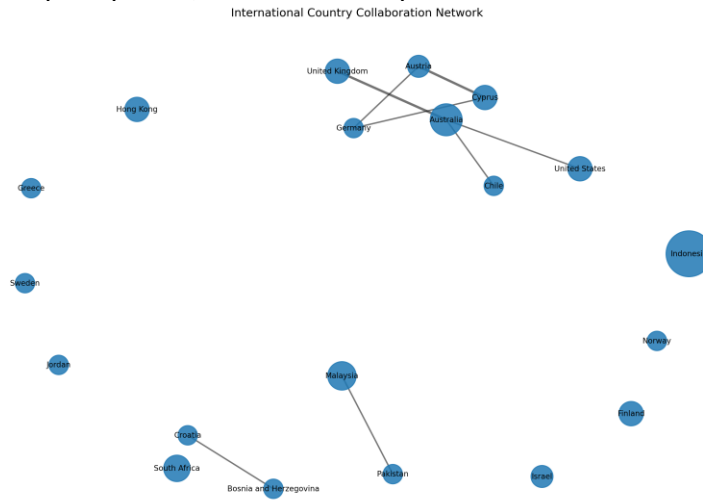
Figure 4 illustrates country scientific production. Indonesia was the most productive country, with 17 documents. Australia followed with seven documents, Malaysia with five, and South Africa with four. Cyprus, Hong Kong, Finland, the United States, and the United Kingdom each contributed three documents. Other countries, including Israel, Austria, Greece, Bosnia and Herzegovina, Croatia, and Jordan, appeared with smaller contributions. The prominence of Indonesia suggests that entrepreneurial leadership of school principals is an important issue in Indonesian educational management, particularly in relation to school entrepreneurship, principal competence, and vocational or school-based entrepreneurship development. The presence of Australia, Malaysia, South Africa, and European countries indicates that the field is also shaped by debates about school autonomy, policy reform, funding challenges, and school improvement.



**Figure 4. Country scientific production**

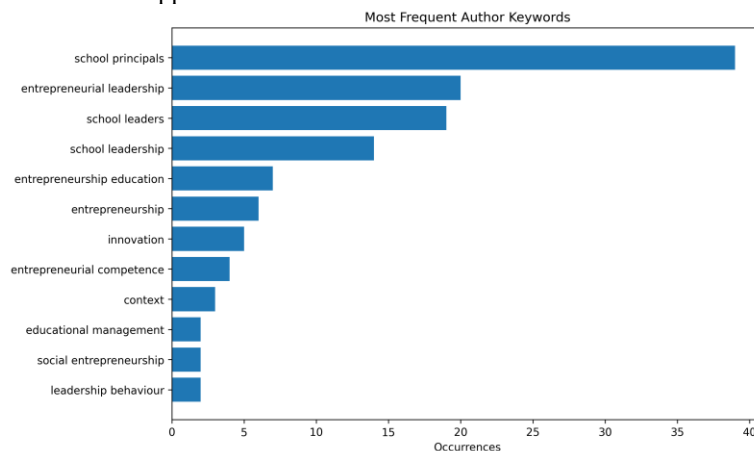
Figure 5 shows the international country collaboration network. The network was relatively sparse, which is consistent with the international co-authorship rate of 13.56%. The strongest visible links included Cyprus-Austria and Australia-United Kingdom, while other collaboration ties connected Malaysia with Pakistan, Bosnia and

Herzegovina with Croatia, Cyprus with Germany, Austria with Germany, Australia with the United States, and Australia with Chile. This pattern indicates that research on entrepreneurial leadership of school principals is still largely produced through national or small regional networks rather than dense global collaboration. Future studies could benefit from comparative cross-national research, especially between countries facing similar issues of school funding, autonomy, leadership competence, and innovation in public education.



**Figure 5. International country collaboration network**

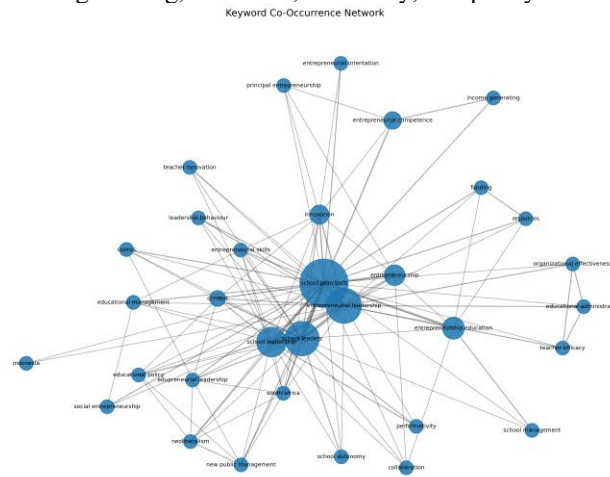
The author keyword analysis confirms the conceptual center of the field. As shown in Figure 6, the most frequent keyword was school principals, with 39 occurrences. This was followed by entrepreneurial leadership with 20 occurrences, school leaders with 19, and school leadership with 14. Other important keywords included entrepreneurship education, entrepreneurship, innovation, entrepreneurial competence, context, educational management, social entrepreneurship, and leadership behaviour. These results indicate that the literature is organized around the principal as the main actor, entrepreneurial leadership as the main leadership orientation, and educational management as the broader field of application.



**Figure 6. Most frequent author keywords**

The keyword co-occurrence network in Figure 7 provides a more detailed picture of conceptual relationships. The strongest link was between school leaders and school leadership, followed by the link between entrepreneurial

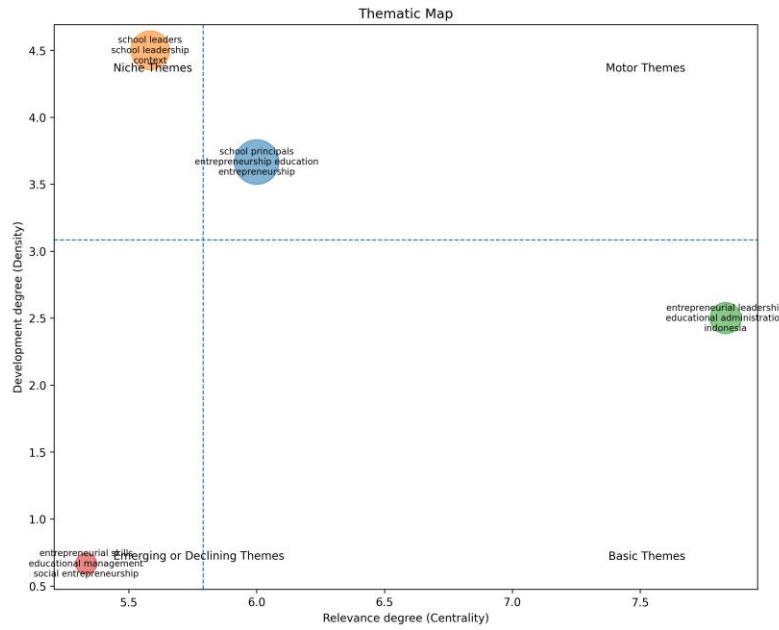
leadership and school principals. Other important links connected school principals with school leaders, school leadership, entrepreneurship education, entrepreneurship, innovation, entrepreneurial competence, funding, resources, and Cyprus. These relationships suggest that the field connects three major concerns. The first is leadership identity, where principals are examined as school leaders and organizational actors. The second is entrepreneurial capacity, including entrepreneurial leadership, entrepreneurial competence, innovation, and entrepreneurship education. The third is institutional context, including funding, resources, autonomy, and policy environments.



**Figure 7. Keyword co-occurrence network**

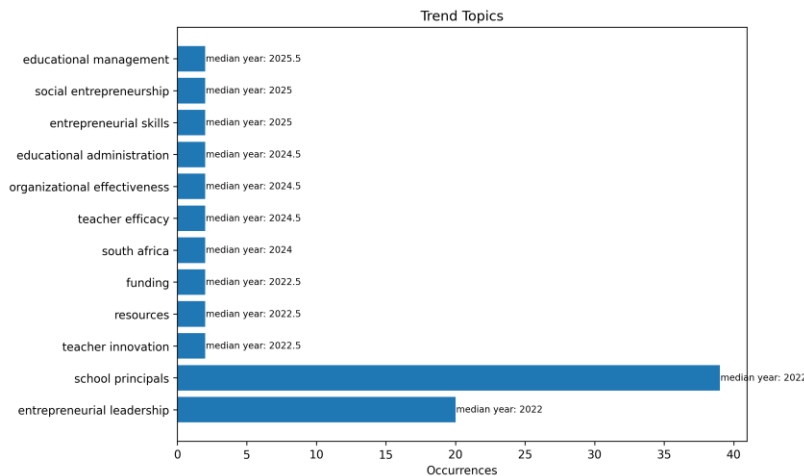
The thematic map in Figure 8 identifies the relative centrality and density of the main keyword clusters. The cluster consisting of school principals, entrepreneurship education, and entrepreneurship appeared as a well-developed and central theme. This suggests that research has established a stable connection between principals and entrepreneurship education or school-based entrepreneurship activities. The cluster consisting of school leaders, school leadership, and context appeared as a niche theme, meaning that it is internally developed but less central to the overall field. This reflects studies that examine context-specific leadership environments, including school autonomy, policy pressure, and national educational systems (Miller, 2018; Pashiardis et al., 2018).

The cluster consisting of entrepreneurial leadership, educational administration, and Indonesia appeared as a basic theme. This means that it is highly relevant to the field but still requires further theoretical development. The position of Indonesia in this cluster is meaningful because many Indonesian studies focus on principal leadership, entrepreneurial competence, school entrepreneurship, and organizational effectiveness. The cluster consisting of entrepreneurial skills, educational management, and social entrepreneurship appeared as an emerging or declining theme. Its recent appearance in trend topics suggests that it is more likely emerging than declining, especially because recent studies connect entrepreneurial leadership with social responsibility, education sustainability, and strategic orientation (Abu Shaqra, 2026; Kubilay & Durnali, 2025; Omotosho & Yassim, 2024).



**Figure 8. Thematic map of entrepreneurial leadership of school principals research**

Trend topic analysis in Figure 9 further supports this interpretation. The most recent topics included educational management, social entrepreneurship, entrepreneurial skills, educational administration, organizational effectiveness, teacher efficacy, South Africa, funding, resources, and teacher innovation. Meanwhile, school principals and entrepreneurial leadership had median years around 2022, indicating that these terms form the stable core of the field. The appearance of educational management, social entrepreneurship, and entrepreneurial skills as recent topics suggests that future research may move beyond general descriptions of entrepreneurial leadership behaviour toward more specific analyses of leadership competence, school-community responsibility, sustainable management, teacher outcomes, and organizational effectiveness.



**Figure 9. Trend topics in entrepreneurial leadership of school principals research**

Taken together, the results show that research on entrepreneurial leadership of school principals is developing at the intersection of educational management, school leadership, entrepreneurship education, school autonomy, and

innovation. The field has a recognizable core around school principals and entrepreneurial leadership, but it also includes related topics such as social entrepreneurship, funding, resources, teacher innovation, and organizational effectiveness. This structure reflects the practical reality of school leadership. Principals are expected to lead teaching and learning, but they are also increasingly required to mobilize resources, build partnerships, support innovation, and respond to policy pressures. Therefore, entrepreneurial leadership should not be interpreted narrowly as business-oriented leadership. In educational management, it refers to the capacity of principals to create value for schools, teachers, students, and communities under conditions of uncertainty and limited resources.

The findings have practical implications for school policymakers, principal preparation programs, and professional development initiatives. First, the prominence of keywords such as entrepreneurial leadership, entrepreneurial competence, innovation, funding, resources, and educational management indicates that principal development should not focus solely on administrative and instructional leadership, but also on strategic resource mobilization, partnership building, innovation management, and opportunity recognition. Second, policymakers should design leadership development programs that help principals respond to school autonomy, funding limitations, and community expectations without reducing education to market-oriented practices. Third, the limited international collaboration found in this study suggests the need for comparative learning among countries that face similar challenges in school governance, resource constraints, and educational innovation. Therefore, entrepreneurial leadership training should be framed as a capacity-building agenda that enables principals to create educational value, strengthen school resilience, and improve institutional responsiveness in changing educational environments.

## CONCLUSION

This study mapped the development of research on entrepreneurial leadership of school principals through a bibliometric analysis of 59 Scopus-indexed articles and reviews published between 2014 and 2026. The findings show that the field has developed unevenly but progressively, with publication peaks in 2018, 2020, and 2024. Research in this area is distributed across educational leadership, educational management, entrepreneurship education, sociology of education, and policy-oriented journals, with *Frontiers in Education* and the *International Journal of Educational Management* appearing as the most productive sources.

The geographical analysis shows that Indonesia, Australia, Malaysia, South Africa, Cyprus, Hong Kong, Finland, the United States, and the United Kingdom occupy visible positions in the literature. However, the international collaboration network remains limited, indicating that research on entrepreneurial leadership of school principals is still largely shaped by national or small regional research networks. This finding highlights the need for stronger comparative and cross-national studies, particularly across education systems facing similar challenges related to school autonomy, principal competence, funding, innovation, and school–community relations.

The keyword and thematic analyses indicate that school principals, entrepreneurial leadership, school leaders, school leadership, entrepreneurship education, entrepreneurship, innovation, entrepreneurial competence, context, and educational management form the dominant conceptual structure of the field. The thematic map shows that principal-related entrepreneurship education is a central and well-developed theme, while entrepreneurial leadership linked with educational administration and Indonesia remains a basic theme requiring deeper theoretical and empirical development. Recent trend topics, including educational management, social entrepreneurship, entrepreneurial skills, organizational effectiveness, teacher efficacy, funding, resources, and teacher innovation, suggest that future research may move toward more specific analyses of leadership competence, school–community responsibility, sustainable management, and organizational outcomes.

This study contributes by providing a structured overview of the publication pattern, source distribution, geographical structure, collaboration network, and thematic development of entrepreneurial leadership research in school principal studies. However, the study is limited to Scopus-indexed English-language articles and reviews, and citation-based ranking could not be included because the exported citation-count data were unavailable. Future studies may compare Scopus with Web of Science, conduct systematic content analysis of key publications, and examine how entrepreneurial leadership practices vary across school levels, national policy contexts, and public-private education systems.

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