



Global Trends in Local Wisdom-Based School Education: A Comprehensive Bibliometric Review (2009–2025)

Syamsidar Saleng^{1*}, Ishaq², Eny Syatriana³

¹Doctoral Student, Education Study Program, Universitas Muhammadiyah Makassar, Makassar, Indonesia

²Department of Physics Education, Universitas Muhammadiyah Makassar, Makassar, Indonesia

³Department of English Education, Universitas Muhammadiyah Makassar, Makassar, Indonesia

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ABSTRACT

This study presents a comprehensive bibliometric analysis of global and national trends in integrating local wisdom within school education between 2009 and 2025. The integration of local wisdom into formal education is gaining urgency amid global calls for culturally responsive, sustainable, and identity-based learning. Despite growing scholarly interest, no prior study has systematically mapped the evolution of this research field. Addressing this gap, the study analyzed 391 Scopus-indexed documents, including journal articles, conference papers, and book chapters, using VOSviewer and Biblioshiny to examine publication trends, key authors, influential institutions, geographic distribution, core sources, and thematic keyword clusters. Results indicate a sharp increase in publications from 2016 onward, with Indonesia emerging as the dominant contributor. Key thematic areas include character education, technological integration, multicultural pedagogy, and ecological literacy. The novel contributions of this study lie in its quantitative, data-driven perspective, which complements previous qualitative findings and offers a macro-level understanding of research trajectories and intellectual structures. The study concludes that local wisdom-based education is becoming a critical domain within educational research, particularly in Southeast Asia, and calls for expanded international collaboration and methodological innovation. By systematically mapping this field, the study contributes to advancing culturally grounded educational practices. It provides actionable insights for educators, policymakers, and researchers seeking to enhance the relevance and inclusivity of education systems.

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Corresponding author:

Syamsidar

Education Study Program, Universitas Muhammadiyah Makassar, Makassar, 90221, Indonesia

Email: syamsidars@unismuh.ac.id

I. INTRODUCTION

The integration of local wisdom into formal education has emerged as a strategic response to global calls for culturally grounded, socially cohesive, and environmentally sustainable schooling. Local wisdom, understood here as the cumulative indigenous knowledge, values, and practices embedded in a community's daily life, offers a living curriculum that resonates with learners' identities and lived realities. In multicultural nations such as Indonesia, where more than 700 ethnic groups coexist, embedding local wisdom in classrooms is not merely a pedagogical choice but a national imperative to cultivate inclusive citizenship and inter-cultural harmony (Huda et al., 2024).

Indonesia's formal education system, founded on the pluralist philosophy of *Bhinneka Tunggal Ika* (Unity in Diversity), is increasingly recognizing that character formation, cultural literacy, and social cohesion cannot rely solely on imported theories and standardized textbooks. Local wisdom provides an endogenous reservoir of moral narratives, conflict-resolution norms, and ecological ethics that can bridge formal curricula with learners' sociocultural milieus, thereby fostering empathy and mutual respect (Patras et al., 2025). By incorporating indigenous concepts such as the *gotong royong* ethic of communal work or the *Tri Hita Karana* vision of human nature balance, teachers can translate abstract values into contextually meaningful learning experiences.

A growing body of empirical research confirms the multifaceted educational benefits of local wisdom. Ethnographic case studies in West Sumatra demonstrate how traditional *randai* dramaturgy enriches character education by modelling honesty, perseverance, and social responsibility (Saaduddin et al., 2024). Beyond character formation, local wisdom has proven instrumental in disaster-risk reduction education, as the integration of indigenous early-warning signs and adaptive practices into primary school science lessons markedly improves pupils' preparedness for climate-induced hazards (Lestari et al., 2025). The pedagogical potential of local wisdom extends across disciplines. Quasi-experimental studies indicate that ethnomathematical tasks rooted in weaving patterns or rice-field geometry stimulate critical thinking and numeracy (Martawijaya et al., 2024). Physics modules centered on traditional boatbuilding promote scientific literacy and environmental stewardship (Sa'dijah et al., 2024). Meanwhile, contemporary innovations, interactive e-modules, augmented-reality applications, and gamified platforms have shown that digital technologies can amplify local-wisdom content, enhancing learner engagement and emotional well-being (Maulana et al., 2024; Rahmasari and Kuswanto, 2023; Suparman et al., 2024).

Although individual studies collectively attest to the pedagogical merit of local wisdom,

the research landscape remains highly fragmented. Most investigations focus on single regions, specific subjects, or isolated interventions, making it challenging to discern broader trajectories, seminal contributors, and emergent themes. Crucially, no comprehensive quantitative synthesis has yet mapped the evolution of local-wisdom scholarship in education across the past decade and a half. The absence of such a macro-level overview hampers educators, researchers, and policy-makers who seek evidence-based guidance for curriculum design, teacher training, and resource allocation (Huda et al., 2024; Saaduddin et al., 2024).

Bibliometric analysis provides a robust methodological approach to addressing this gap. By harvesting meta-data from authoritative indexing services such as Scopus, bibliometrics can chart publication growth, spotlight prolific authors and institutions, trace citation networks, and visualize thematic clusters with statistical rigour (Martawijaya et al., 2024; Wijayanti, 2025). Such a systematic, data-driven approach complements narrative reviews by revealing hidden patterns, collaborative constellations, and under-explored niches that might otherwise remain obscured.

Existing bibliometric investigations in adjacent domains, character education, culturally responsive pedagogy, and sustainability science, have demonstrated the value of mapping research ecosystems to accelerate knowledge transfer and inform agenda setting. However, to date, no study has undertaken a dedicated bibliometric survey of local-wisdom integration in school education from 2009 to 2025. Consequently, questions about geographical diffusion, authorship influence, and thematic convergence remain unresolved.

Addressing this gap, this study aims to conduct a comprehensive bibliometric analysis of 391 peer-reviewed publications indexed in Scopus between 2011 and 2025. Utilizing tools such as VOSviewer and Biblioshiny, the research quantifies publication trajectories, identifies high impact journals, enumerates leading authors and countries, and maps keyword co-occurrence networks. The novelty of this inquiry lies in its holistic, quantitative vantage point, which offers actionable insights for future scholarship and policy formulation. This study is guided by six interrelated research questions:

- 1) How has the annual volume of publications on local wisdom and schooling evolved?
- 2) Which source titles contribute most substantively to this body of work?
- 3) Who are the most influential authors in terms of productivity and citations?
- 4) Which countries demonstrate the most incredible research intensity?
- 5) What keywords dominate the discourse on local wisdom in education?
- 6) How do these keywords cluster to form the current thematic landscape?

II. METHODS

This study employed a quantitative bibliometric design to map and analyze scholarly discourse on the integration of local wisdom in school education published between 2011 and 2025. The methodological workflow comprised five sequential stages: (i) data retrieval, (ii) screening and eligibility assessment, (iii) data cleaning and preparation, (iv) bibliometric mapping, and (v) statistical and network analyses. The Scopus database (<https://www.scopus.com>) was selected as the sole data source due to its broad disciplinary coverage and reliable bibliographic records, including abstracts, author affiliations, citation counts, and indexing metadata, which are essential for robust bibliometric inquiry (Visser et al., 2021). An advanced search was executed on 17 July 2025 using the string: TITLE-ABS-KEY (local wisdom AND school). The query targeted occurrences of the phrase “local wisdom” in tandem with “school” across titles, abstracts, and author-supplied keywords. The initial retrieval returned 398 records. To ensure analytical coherence, records were filtered according to the following criteria: publication window, 1 January 2011 – 31 December 2025; document types: articles, conference papers, conference reviews, and book chapters; and language: English. After applying these criteria, seven non-conforming records were removed, yielding a final corpus of 391 documents for analysis.

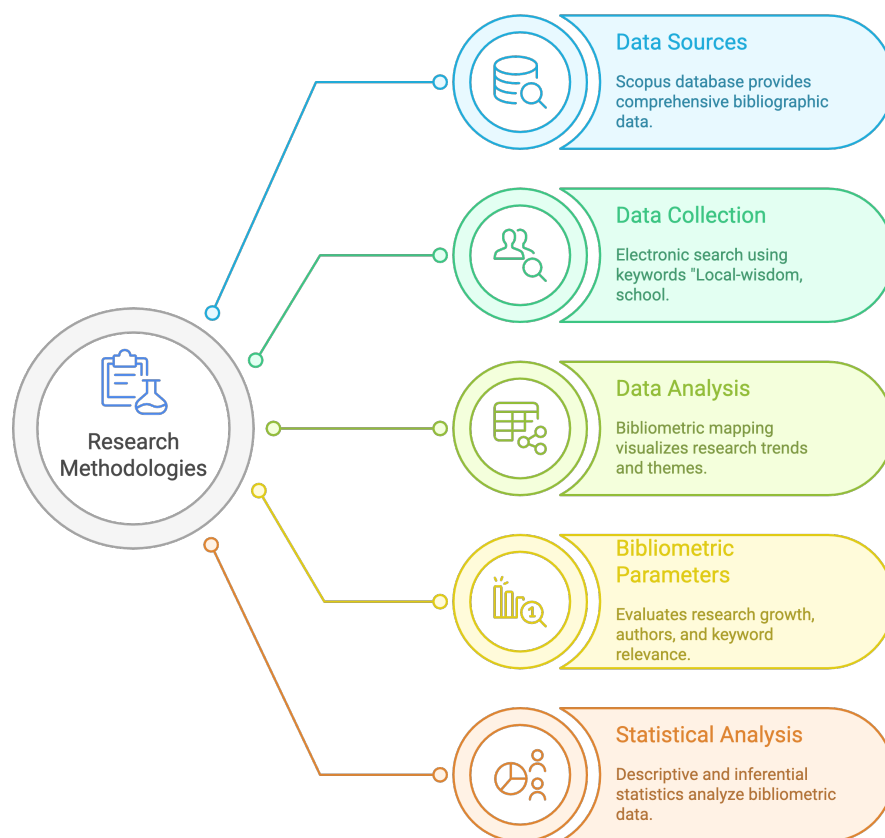


Figure 1. Research methodology framework for bibliometric analysis in this study

The bibliographic information of the 391 eligible documents was exported from Scopus in comma-separated values (CSV) format. The dataset was examined in Microsoft Excel to detect and correct inconsistencies in author names, institutional affiliations, and keyword spellings. Duplicates were cross-checked against Scopus EIDs and removed. The cleaned file was subsequently imported into VOSviewer and Biblioshiny (the web interface of the *bibliometrix* R package) for downstream analyses (Aria & Cuccurullo, 2017).

A suite of performance and science-mapping indicators was generated: Productivity metrics: annual publication counts, document types, source titles; Citation metrics: total citations, average citations per document, h-index of authors and sources; Collaboration metrics: co-authorship by author, institution, and country; Conceptual metrics: keyword co-occurrence and thematic evolution. VOSviewer's fractional counting algorithm and LinLog normalization were used to visualize co-authorship, co-citation, and keyword networks (Eck & Waltman, 2017). Thresholds for inclusion in visual maps were set at a minimum of five documents per author/source and five keyword occurrences to strike a balance between comprehensiveness and readability.

Descriptive statistics (frequencies, percentages, and means) were calculated in Excel. Inferential analyses, including Lotka's Law for author productivity and Bradford's Law for source dispersion, were performed in Bibliometrix. Biblioshiny facilitated thematic mapping, conceptual structure analysis (Multiple Correspondence Analysis), and trend-topic visualization (Aria et al., 2023; Aria and Cuccurullo, 2017). All network graphs were exported in high-resolution PNG format for presentation. By integrating rigorous database selection, structured screening, meticulous data cleansing, and multifaceted mapping techniques, the adopted methodology provides a replicable pathway to elucidate publication trends, intellectual structures, and emerging themes in the field of local-wisdom-based education (Bancong, 2024; Nanda et al., 2025)

III. RESULTS

1. Yearly trend of publications and citations

A total of 391 Scopus-indexed records, including journal articles, conference proceedings, book chapters, and conference reviews, were retrieved for the period 2009-2025 to chart the evolution of scholarship on local wisdom in school education. Figure 2 visualizes the annual output trajectory and reveals three distinct phases. First, research activity in the exploratory phase (2009-2015) was sporadic during the first seven years, with only one to six publications released annually. This modest baseline suggests that the topic was still peripheral to mainstream

educational discourse. Second, during the acceleration phase (2016-2018), scholarly attention intensified markedly after 2016. Annual output climbed from 17 documents in 2017 to 35 in 2018, more than doubling within a single year and signaling the emergence of locally wisdom-oriented pedagogy as a coherent research agenda. Third, during the consolidation and zenith phase (2019-2025), the publication volume stabilized between 2019 and 2022, at 36-49 items per year, indicating sustained interest and field maturation. The trajectory peaked in 2023 with 64 publications, the highest in the observation window, coinciding with a global push for culturally responsive and sustainability-focused curricula. Output then tapered to 38 documents in 2024 and 35 in 2025. Whether this decline denotes thematic saturation, post-pandemic funding realignments, or a temporary fluctuation warrants continued monitoring. Overall, the decade-long trend demonstrates a robust expansion of research at the nexus of local wisdom and school education. The steep growth since 2017 underscores both the rising relevance of culturally embedded pedagogy and the need for a deeper exploration of emergent subtopics, cross-regional comparisons, and collaborative frameworks.

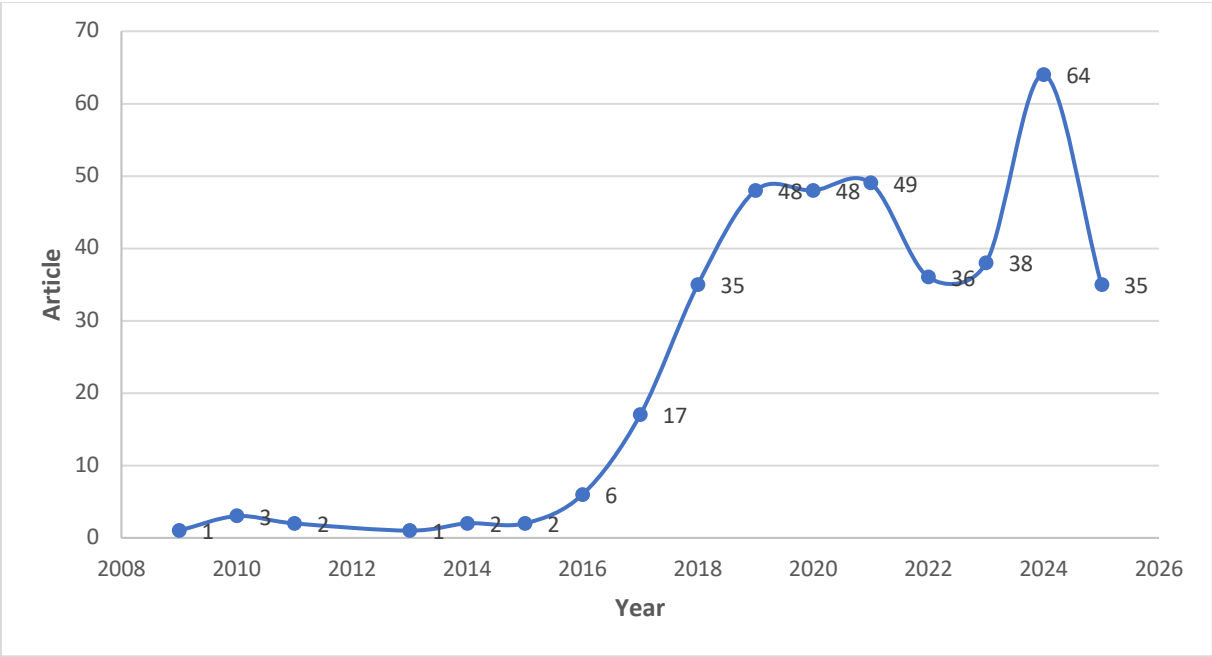


Figure 2. Annual publication volume on local wisdom in school education (2009-2025)

From a total of 391 documents retrieved from the Scopus database, encompassing journal articles, conference papers, book chapters, and conference reviews, a ranking of the top 10 most cited publications within the topic of local wisdom and school education was compiled (see Table 1). These publications represent seminal works that have shaped the academic discourse and application of local cultural knowledge within educational contexts, particularly in Indonesia.

Table 1. Highly cited local wisdom and school research

Rank	Title	Year	Source Title	Cited By	Ref.
1	The reconstruction of disaster knowledge through thematic learning of science, environment, technology, and society, integrated with local wisdom	2018	Jurnal Pendidikan IPA Indonesia	26	(Atmojo et al., 2018)
2	Developing disaster mitigation education with local wisdom: exemplified in Indonesian schools	2021	IOP Conference Series: Earth and Environmental Science	18	(Triastari et al., 2021)
3	Development of physics comics based on local wisdom: hopscotch (engklek) game, android-assisted to improve mathematical representation ability and creative thinking of high school students	2020	Revista Mexicana De Fisica E	17	(Sari et al., 2020)
4	Improving students' mathematical representation and critical thinking abilities using the Caka media based on local wisdom	2021	International Journal of Interactive Mobile Technologies	9	(Kurniawan & Kuswanto, 2021)
5	Pandemic pedagogy in the era of digital transformation	2021	ACM International Conference Proceeding Series	5	(Amelia et al., 2021)
6	The effectiveness of problem-based learning physics pocketbook, integrating augmented reality with the local wisdom of catapults in improving mathematical and graphical representation abilities	2023	Journal of Technology and Science Education	4	(Rahmasari & Kuswanto, 2023)
7	Student knowledge about disaster in vocational school and high school: case study in Lombok, Indonesia	2021	IOP Conference Series: Earth and Environmental Science	3	(Dwiningrum et al., 2021)
8	Developing local wisdom-based mobile science learning in the manufacturing of Sasirangan fabric to improve the ICT literacy facility of junior high school students	2020	AIP Conference Proceedings	2	(Amrita et al., 2020)
9	Portrait of ecoliteracy competence in elementary school students: relationship of ecoliteracy competence on environmental sustainability in indonesia	2023	Environment and Ecology Research	1	(Setiadi et al., 2023)
10	Field trial of provus-alkin-amalgamation evaluation application based on weighted-product-rwa-bhineda mods	2025	Journal of Education and Learning	1	(Suyasa et al., 2025)

These top-cited works illustrate diverse methodological approaches and contexts of implementation ranging from thematic science learning, physics education with AR and comics, to disaster preparedness and ecological literacy. Notably, many studies emphasize the integration of indigenous knowledge into technology-enhanced learning environments, showing a trend towards culturally adaptive digital pedagogy. The most cited study, [Atmojo et al. \(2018\)](#), underscores the importance of integrating science and local cultural values in disaster education. Similarly, [Kurniawan and Kuswanto \(2021\)](#); [Triastari et al. \(2021\)](#). How disaster mitigation and mathematical skills can be enhanced through local wisdom-based models and media. Other influential works include explorations into pandemic pedagogy ([Amelia et al., 2021](#)), mobile science learning using Sasirangan manufacturing ([Amrita et al., 2020](#)), and ecoliteracy enhancement via localized environmental education ([Setiadi et al., 2023](#)). These findings suggest that the intersection of education, technology, and local wisdom is gaining scholarly attention, particularly in the context of enhancing student engagement, critical thinking, and resilience in Southeast Asian educational settings.

2. Most relevant sources

Figure 3 traces the cumulative publication output of the five most prolific venues that have shaped scholarship on local wisdom in school education. The dataset comprises 391 Scopus-indexed records spanning 2009-2025 and includes journal articles, conference papers, book chapters, and conference reviews. Journal of Physics: Conference Series established an unmistakable lead beginning in 2017, when its annual count quadrupled relative to the previous year. By 2020, it had achieved a plateau of steady production, ultimately surpassing 60 cumulative papers by 2025, nearly one-sixth of the field's total corpus. This dominance signals that many studies embed local-wisdom themes within STEM-oriented teaching innovations routinely presented at physics-focused conferences.

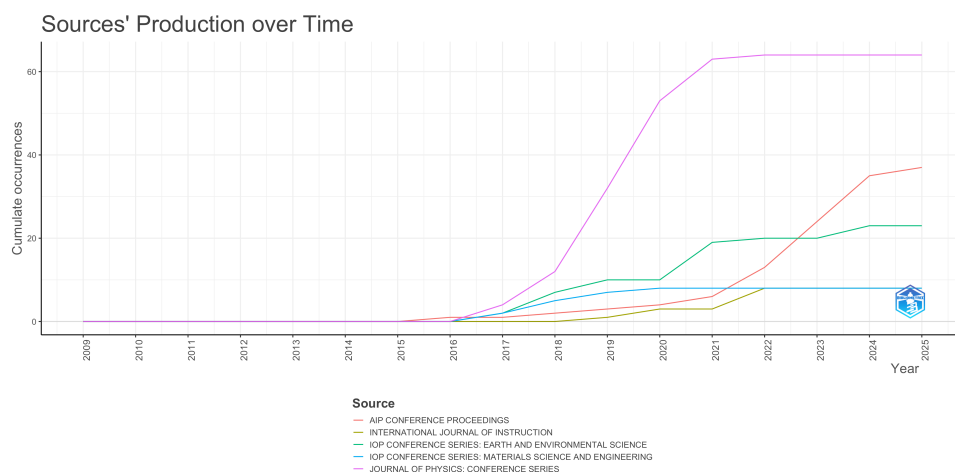


Figure 3. Sources' production over time

Table 2 consolidates the ten venues that have most decisively shaped discourse on local wisdom in school education. Conference proceedings dominate the list, reflecting the field's relatively nascent and multidisciplinary character, yet several peer-reviewed journals display outsized citation influence. The Journal of Physics: Conference Series leads with 65 papers one in every six items in the dataset and 290 citations, confirming its role as the community's principal dissemination hub. Likewise, AIP Conference Proceedings contributes 37 papers, albeit with a modest 38 citations, indicating broad but relatively shallow influence.

Table 2. Top ten publishing research on local wisdom and school education (2009-2025)

Rank	Relevant sources	Document	Citation	Total link strength
1	Journal of physics: Conference series	65	290	2
2	AIP conference proceedings	37	38	5
3	Iop conference series: earth and environmental science	23	103	0
4	International journal of instruction	8	232	10
5	IOP conference series: materials science and engineering	8	21	0
6	International journal of evaluation and research in education	5	73	7
7	Jurnal Pendidikan IPA Indonesia	7	140	5
8	Revista de gestao social e ambiental	6	4	2
9	Journal of Ecohumanism	6	1	8
10	Journal of engineering science and technology	5	53	3

3. *Most influential authors*

Figure 4 presents a three-field plot elucidating the interrelations among countries (left column), prominent keywords (center column), and institutional affiliations (right column) related to research on local wisdom and school education from 2009 to 2025. This bibliometric analysis provides a clear visualization of the geographical, thematic, and institutional dynamics within this research field. Indonesia overwhelmingly dominates research output, being the country with the most significant representation in terms of publications. This is visually evident as Indonesia exhibits strong connections with multiple keywords and various institutional affiliations. Other countries, including Malaysia, China, Australia, the United Kingdom, Thailand, South Africa, Saudi Arabia, and Oman, contribute marginally to comparison, reflecting lesser engagement in this research area. The central thematic keyword, "local wisdom," serves as the most dominant and interconnected keyword, indicative of its broad acceptance and relevance across educational research. Subsequent frequently co-occurring keywords include "character education," "elementary school," "e-module," and

productivity over several years, consistently contributing to the advancement of the discourse surrounding the integration of local wisdom in education. Additionally, authors such as Suparman and Suprpto displayed periods of heightened research activity, with clusters of publications during specific intervals, reflecting focused thematic explorations or research projects. The timeline also highlights significant scholarly output from emerging researchers, such as Andayani and Arifin, around 2020, with each contributing multiple impactful studies within a relatively short span. Overall, the authorship analysis identifies key researchers who have significantly shaped the scholarly landscape. Their persistent contributions, varied in both breadth and thematic focus, demonstrate an active and diverse research community dedicated to exploring the educational applications of local wisdom.

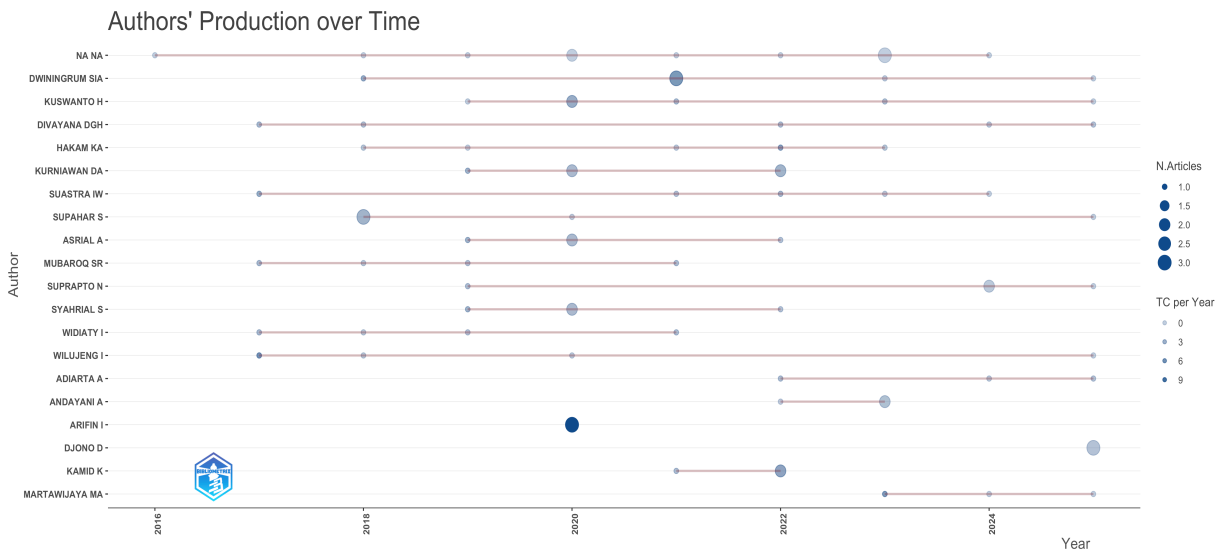


Figure 5. Authors' scholarly production over time

4. Most influential countries

Figure 6 displays the geographical collaboration patterns among corresponding authors publishing research on local wisdom and school education between 2009 and 2025. This visualization distinguishes between single-country publications (SCPs) and multiple-country publications (MCPs). Indonesia is distinctly the leading country, contributing the highest number of publications with over 200 documents, predominantly from single-country collaborations. However, it also presents a significant number of multi-country collaborative works, indicating active international scholarly interactions. Thailand emerges as the second most productive country with a considerable representation of single-country publications. Nevertheless, its multi-country collaborative output remains relatively minimal, suggesting potential areas for fostering increased international partnerships. Malaysia, India, Japan, Australia, Sri Lanka, and the United Kingdom each exhibit relatively lower publication

frequencies. These countries exhibit both single-country and multi-country collaborations, albeit on a smaller scale. Overall, the analysis identifies Indonesia as the central hub for research activity and scholarly exchange on local wisdom and school education.

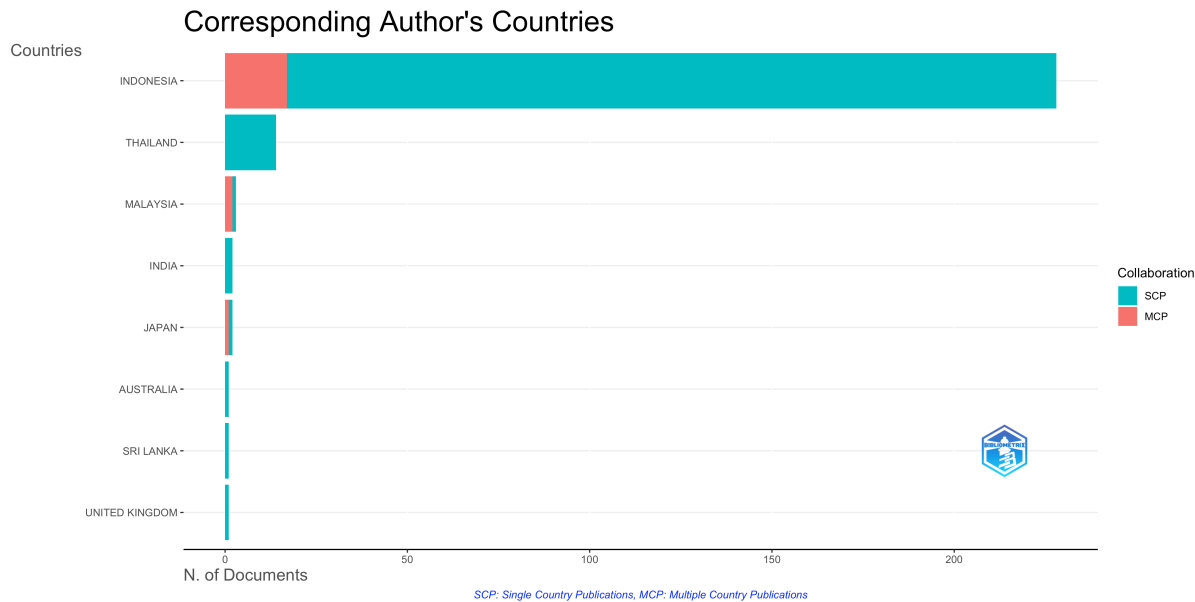


Figure 6. Corresponding author’s countries

Figure 7 depicts the bibliographic coupling among countries involved in research on local wisdom and school education. This bibliographic coupling illustrates the extent and nature of intellectual connections between countries through shared references. Indonesia emerges prominently as the central node within this coupling network, exhibiting extensive bibliographic connections with multiple countries, including Malaysia, Thailand, Saudi Arabia, Oman, the United Kingdom, the United States, Poland, Australia, China, New Zealand, Taiwan, and Austria. This prominent centrality underscores Indonesia’s pivotal role in shaping scholarly discourse and influencing research directions in the domain of local wisdom and education.

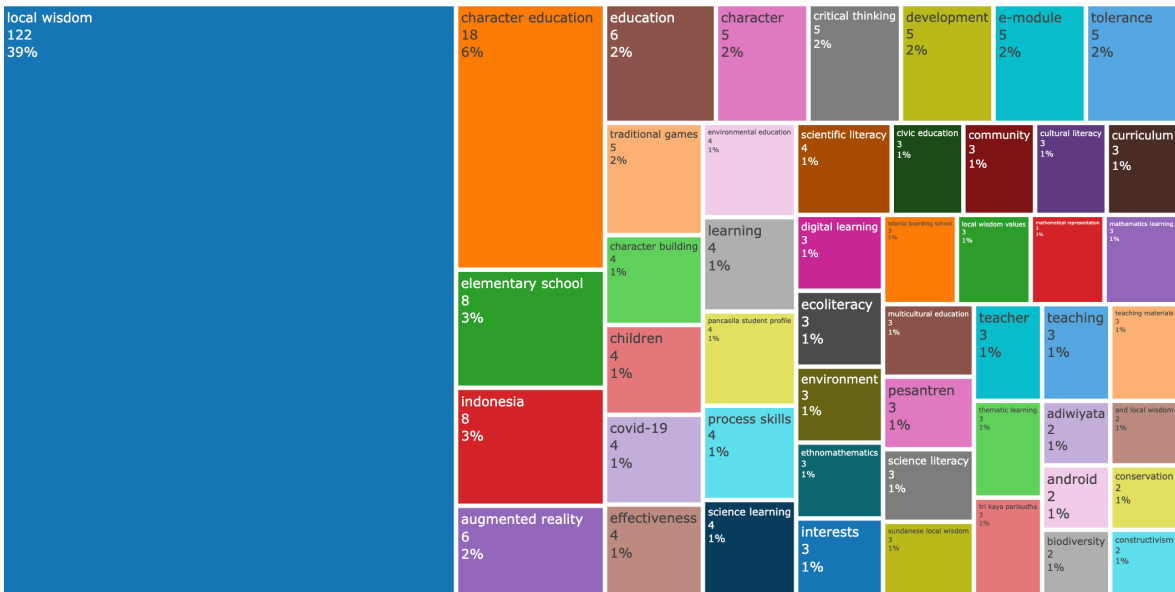


Figure 7. Bibliographic coupling of countries

Malaysia and Thailand form secondary but significant nodes within the network, indicating robust scholarly interactions and mutual citation relationships, particularly Malaysia's strong coupling with Taiwan. Such linkages highlight regional scholarly dynamics and intellectual exchanges. Other countries, including the United Kingdom, the United States, Saudi Arabia, Australia, China, and New Zealand, exhibit moderate bibliographic coupling with Indonesia, indicating valuable yet less intense intellectual connections. Countries such as Poland, Oman, and Austria exhibit minimal bibliographic coupling, highlighting emerging or limited scholarly exchanges within this research context. In summary, the bibliographic coupling network emphasizes Indonesia's central influence and highlights varying levels of international collaboration and intellectual connectivity, reflecting both established and potential avenues for expanding global scholarly collaboration in local wisdom and school education research.

5. Most relevant keywords

Figure 8 illustrates a tree map visualization of authors' keywords, extracted from the bibliometric analysis of 391 documents sourced from the Scopus database, focusing on local wisdom and school education between 2009 and 2025. This visualization highlights the most frequently used keywords by authors, providing insights into prevalent themes and research focuses within this scholarly domain. "Local wisdom" emerges prominently as the most frequently utilized keyword, appearing in 122 documents (39%), clearly denoting its central thematic position and significance in educational research contexts. This dominance underscores researchers' concentrated emphasis on examining the role and integration of cultural and indigenous knowledge within educational practices.



Character education is another significant keyword, appearing in 18 documents (6%), reflecting substantial scholarly interest in exploring moral and ethical dimensions in education facilitated through local cultural contexts. "Elementary school" and "Indonesia" each appear in eight documents (3%), indicating a strong focus on early educational settings and highlighting Indonesia as a crucial geographical context for this research. Additional noteworthy keywords include "augmented reality," "education," "character," "development," "e-module," and "tolerance," each appearing in approximately 2-6 documents (2%), indicating diverse thematic interests ranging from technological integration to ethical and developmental educational aspects. In summary, the tree map highlights a robust thematic diversity in the scholarly literature. The representation of varied educational dimensions, technological aspects, and sociocultural themes demonstrates the rich and multifaceted nature of research within the intersection of local wisdom and school education.

Figure 9 illustrates the keyword co-occurrence network, focusing on local wisdom and school education research from 2009 to 2025. This network visualization identifies and clusters closely related keywords, elucidating central themes and their interconnections. The keyword "local wisdom" is centrally positioned and demonstrates robust connectivity, signifying its foundational role and widespread influence across various thematic clusters. Closely associated keywords include "students," "Indonesia," and "elementary school," indicating the targeted demographic and geographical focus areas that researchers have studied prominently.

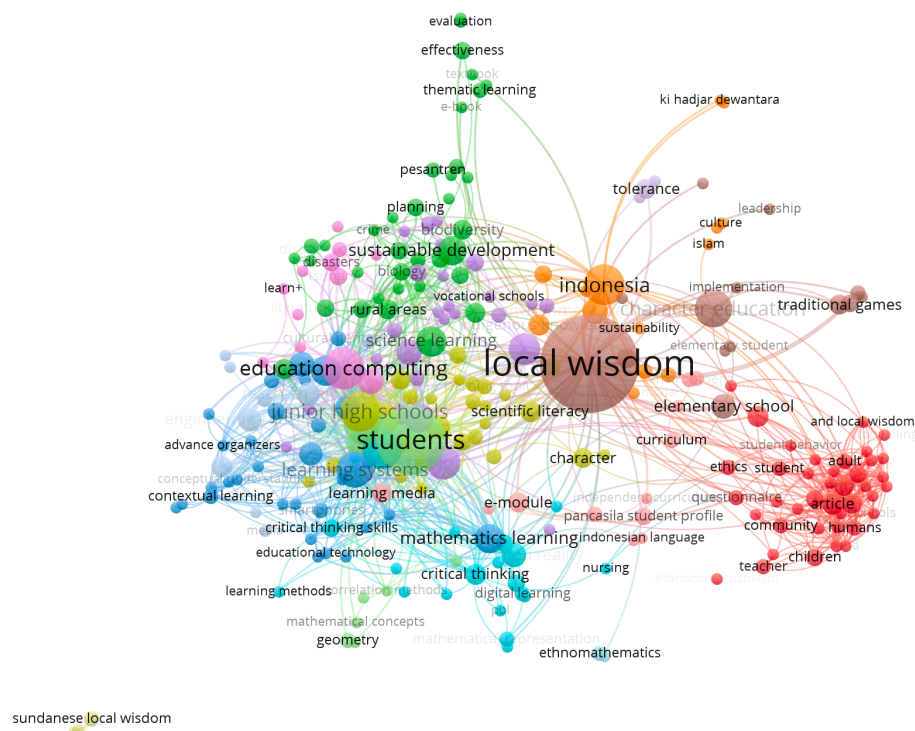


Figure 9. Keywords: co-occurrence analysis by network visualization

Several distinct thematic clusters emerge from the analysis. One prominent cluster, interconnected by keywords such as "traditional games," "culture," "curriculum," and "ethics," highlights the cultural and ethical dimensions in educational research. Another cluster, encompassing terms such as "e-module," "digital learning," "education computing," and "learning systems," highlights the technological integration within educational contexts, reflecting a trend toward leveraging digital solutions to enhance learning. A significant group of keywords, including "critical thinking," "mathematics learning," and "ethnomathematics," reveals an educational focus on cognitive and mathematical skill development contextualized within local cultural knowledge. Furthermore, the cluster featuring "sustainable development," "rural areas," and "biodiversity" indicates an emerging interdisciplinary research area linking educational practices with ecological and sustainability concerns. The network visualization also highlights minor but notable clusters associated with specialized thematic interests such as "vocational schools," "junior high schools," and specific learning methodologies. These clusters offer insights into the diverse educational levels and methodological innovations explored within local wisdom-based education research.

6. *The current research landscape*

Figure 10 illustrates the trends in research topics related to local wisdom and school education. This analysis highlights the temporal prominence and frequency of specific topics in recent scholarly research. The topic "Indonesia" demonstrates significant consistency in terms of frequency and scholarly attention. It underscores the region-specific relevance of local wisdom-based education research. Additionally, the topics "research and development" and "students" display sustained scholarly interest, indicating continuous exploration and emphasis on practical educational improvements and student-centered research within the field. Emerging topics such as "education computing" and "learning systems" reflect a growing scholarly interest from 2018 onwards, highlighting the integration of technological advancements and systematic learning methodologies into the educational landscape, influenced by local wisdom. Similarly, the "junior high schools" and "elementary schools" topics underscore focused research at specific educational levels, emphasizing early educational contexts as critical for embedding local cultural and ethical values. Topics such as "teaching" and "physics learning" emerge with moderate frequency around 2017 and 2018, suggesting periodic scholarly explorations into instructional strategies and discipline-specific applications of local wisdom. Overall, the trend analysis identifies consistent thematic focuses and highlights emerging and recurring interests. It demonstrates the rich interplay between cultural context, educational innovation, and methodological rigor in shaping contemporary scholarly

discourse on local wisdom and school education.

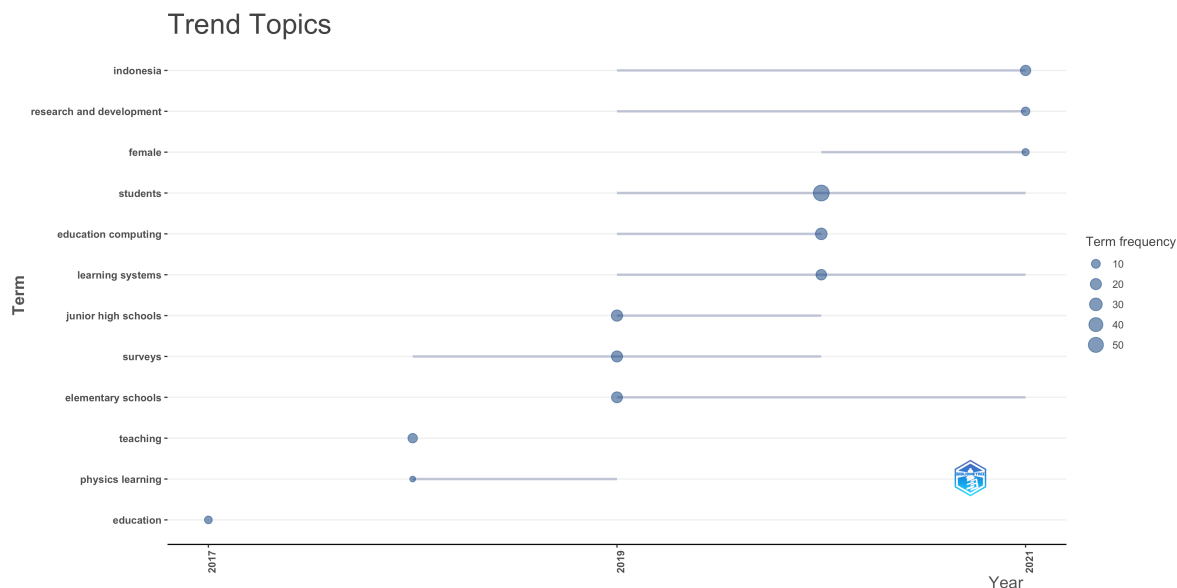


Figure 10. Trend topics of local wisdom

Figure 11 presents a thematic map derived from a bibliometric analysis of 391 documents from the Scopus database. This thematic map is divided into four quadrants based on density (development degree) and centrality (relevance degree). The motor themes quadrant identifies topics with both high centrality and density, indicative of well-developed and extensively researched areas crucial to the field. Keywords such as "students," "education computing," and "junior high schools" prominently appear. These keywords reflect significant scholarly attention and research activity in integrating local wisdom with technological advancements and educational systems targeted toward adolescent students. Basic themes are characterized by their high centrality but lower density. Keywords identified here include "sustainable development," "physics," and "environmental education." These keywords highlight essential interdisciplinary connections between educational practices and broader societal and ecological considerations. The niche themes quadrant comprises specialized research areas characterized by high density but lower centrality. This quadrant encompasses terms such as "engineering and mathematics," "STEM (science, technology)," and "technology," representing focused academic niches exploring the specific integration of local wisdom within technical and scientific education frameworks. Finally, the emerging or declining themes quadrant captures areas with low density and centrality. Keywords in this theme include "digital storage," "primary schools," and "architecture," suggesting potential new avenues for research exploration or areas currently experiencing decreased scholarly emphasis.

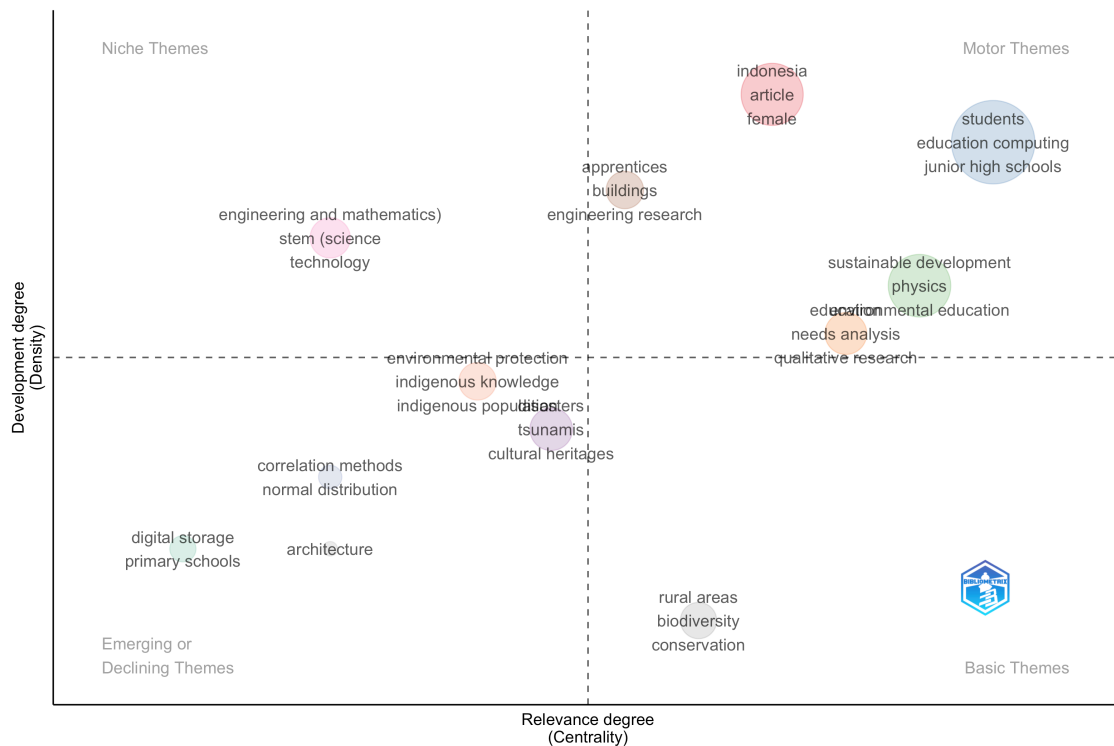


Figure 11. Thematic map of local wisdom and school

Finally, figure 12 presents a thematic keyword evolution heatmap reflecting the trends in scholarly discourse on local wisdom and school-related topics from 2009 to 2025. The data encompass a variety of document types, including journal articles, conference papers, book chapters, and conference reviews. The x-axis of the heatmap represents specific keywords, while the y-axis captures the publication years. A marked increase in thematic concentration is observable beginning in 2016, with a pronounced escalation from 2019 onward. The keyword “local wisdom” demonstrates a particularly steep trajectory, rising from marginal counts in earlier years to peak values of 21, 17, and 24 in 2020, 2023, and 2024, respectively. Similarly, the keyword “students” emerges consistently across the time series, peaking at 13 in 2019 and maintaining a strong presence thereafter. Keywords such as “education computing,” “elementary schools,” “character education,” and “junior high schools” exhibit significant thematic prominence starting in 2018. Thematic clusters related to pedagogy, namely “learning systems,” “teaching materials,” “science learning,” and “mathematics learning,” begin to gain traction in the post-2018 period. This trend indicates a shift in focus from general educational frameworks to more specific disciplinary applications within the broader context of local cultural integration. Overall, the findings reflect a sustained and growing scholarly emphasis on local wisdom in school settings, aligning with global trends in culturally responsive pedagogy and contextualized learning environments.

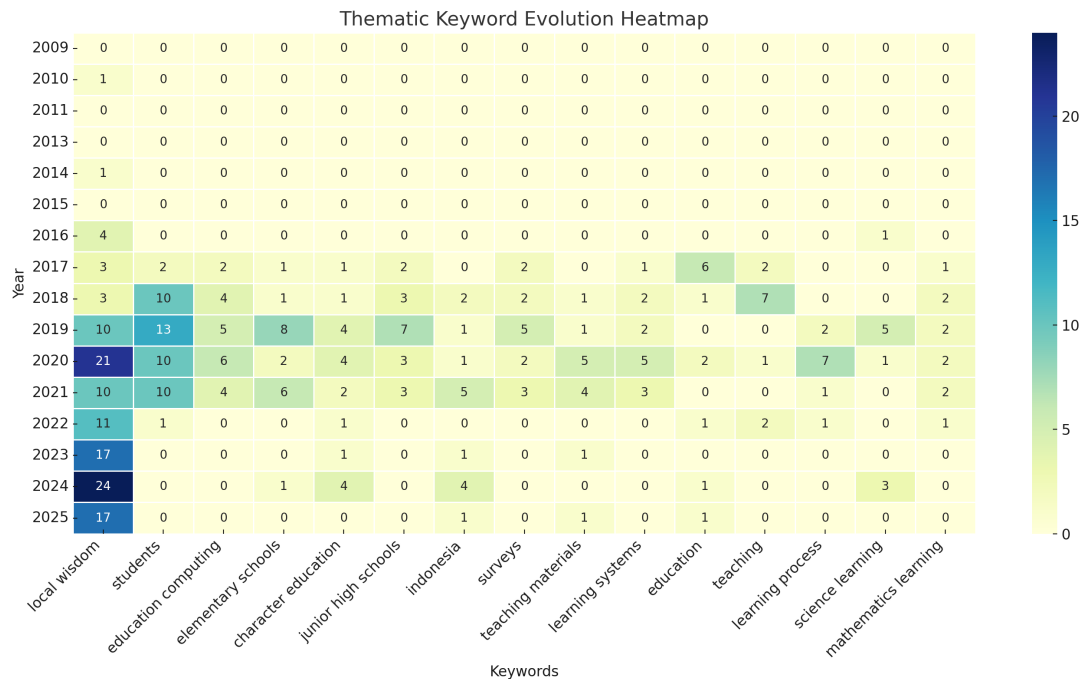


Figure 12. Thematic keyword evolution heatmap

IV. DISCUSSION

The findings from this bibliometric analysis reveal significant trends and developments in research on integrating local wisdom into educational contexts, specifically within school settings, from 2009 to 2025. The analysis reveals a pronounced increase in academic interest and publications, particularly since 2016, indicating a robust and growing scholarly focus on the intersection between local wisdom and formal education systems. This trend aligns with global educational movements that advocate for culturally responsive pedagogies to enhance learning outcomes and foster cultural identity among students (Huda et al., 2024; Patras et al., 2025).

The prominent thematic concentration identified through keyword analysis, notably "local wisdom," "students," "character education," and "education computing," underscores the multidimensional nature of this research area. These findings resonate with prior literature, which emphasizes local wisdom as a critical element in character education, multicultural competencies, and ecological literacy (Lestari et al., 2025; Saaduddin et al., 2024). Additionally, the increased focus on digital and computational tools suggests an emerging recognition of the potential synergy between traditional knowledge systems and contemporary educational technologies, enhancing student engagement and learning outcomes (Maulana et al., 2024; Suparman et al., 2024).

Comparative analysis with prior studies indicates consistent alignment with earlier

qualitative and quantitative research, which has demonstrated the efficacy of integrating local wisdom within curricula to improve students' moral, social, and cognitive skills. For instance, character education models using Si Muntu dramaturgy and Dalihan Na Tolu values have previously shown significant improvement in students' moral character and ethical decision-making (Saaduddin et al., 2024). Similarly, studies involving disaster mitigation education grounded in local wisdom have underscored its effectiveness in enhancing students' practical knowledge and preparedness for environmental hazards (Lestari et al., 2025; Triastari et al., 2021).

However, this study goes further by providing a comprehensive bibliometric landscape, identifying not only prevalent themes but also key contributors, publication sources, influential authors, and geographic distributions. Indonesia emerges prominently as the leading country in scholarly output, reflecting its unique multicultural context and emphasizing its central role in shaping research trajectories in this domain. The findings further highlight several institutions within Indonesia, notably Universitas Negeri Yogyakarta and Universitas Pendidikan Indonesia, as pivotal academic centers contributing significantly to this field.

The analysis of influential authors revealed sustained scholarly contributions from researchers such as Dwiningrum and Kuswanto, whose works have significantly shaped academic discourse around local wisdom integration in education. Their contributions have not only enriched the academic literature but also provided practical frameworks for implementing culturally contextualized learning environments (Amrita et al., 2020; Atmojo et al., 2018; Kurniawan and Kuswanto, 2021; Rahmasari and Kuswanto, 2023). Such scholarly endeavors reinforce the value of contextually and culturally grounded education practices, confirming the relevance and efficacy of local wisdom in addressing educational challenges. Moreover, the bibliometric coupling and international collaboration findings indicate moderate yet meaningful global engagement, suggesting room for greater international scholarly exchange. Enhanced international collaboration could potentially lead to richer, more diverse research insights and stronger methodological rigor, thus broadening the global applicability and impact of local wisdom-based educational research.

The thematic keyword evolution heatmap presented in Figure 12 particularly highlights a dynamic and evolving scholarly interest. The growing prominence of thematic clusters such as “education computing,” “science learning,” and “mathematics learning” reflects a strategic shift from general pedagogical practices toward targeted disciplinary integrations. Such shifts underscore the broader implications of the findings for curriculum development and instructional strategies, particularly in integrating technological innovations within traditional

knowledge frameworks. This approach aligns with previous research advocating interdisciplinary methods and technological integration to foster critical and creative thinking. (Martawijaya et al., 2023; Sadijah et al., 2024; Sari et al., 2020).

Practically, the implications of these findings extend beyond academia into educational policymaking and practice. The systematic mapping provided in this study offers policymakers, educators, and curriculum developers actionable insights to integrate local wisdom within educational contexts more effectively. The data highlight essential areas such as disaster education, character building, multicultural education, and technological integration, which could significantly enhance educational quality and cultural relevance. Furthermore, this research addresses existing gaps identified in earlier literature, particularly the absence of comprehensive bibliometric studies within this field. The systematic and quantitative approach adopted in this analysis provides a robust and reliable foundation for future research initiatives. It is imperative for future studies to investigate the effectiveness of specific local wisdom practices across varied educational contexts, possibly employing mixed methods to achieve richer insights. Ultimately, this research makes a significant contribution to the field by synthesizing fragmented findings into a coherent and comprehensive bibliometric landscape. It confirms the relevance and educational significance of integrating local wisdom, underscoring its potential to enhance student learning experiences and educational outcomes comprehensively. Additionally, this study sets a foundation for future scholarly endeavors, offering clear directions for further research and practical implementation, ultimately supporting the advancement of culturally responsive and effective educational practices.

V. CONCLUSION

This bibliometric study revealed a significant growth in scholarly interest concerning the integration of local wisdom in school education from 2009 to 2025. The analysis of 391 Scopus-indexed documents identified key trends, including a steady rise in publications since 2016, with Indonesia emerging as the most prominent contributor. The research highlighted the dominant themes of character education, culturally responsive pedagogy, and digital integration. Leading institutions like Universitas Negeri Yogyakarta and Universitas Pendidikan Indonesia were also found to play a central role in advancing this field. Keyword analysis and thematic mapping further illustrated the expanding scope of local wisdom in addressing educational priorities such as ecological literacy, technological innovation, and multicultural education.

Despite its strengths, the study has several limitations. It exclusively relies on the Scopus database, potentially omitting relevant research indexed elsewhere. The analysis is also limited to English-language publications, which may underrepresent local-language scholarship. Future research should explore broader databases, include non-English sources, and adopt mixed-method approaches to assess the practical impact of local wisdom-based education in diverse contexts. This study contributes to the field by offering a data-driven overview of research trends, identifying influential scholars and institutions, and mapping emerging themes. It highlights the importance of local wisdom in enriching educational practices and lays the groundwork for more globally connected, culturally inclusive, and evidence-based educational strategies.

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REFERENCES

- Amelia, R., Dwiningrum, S. I. A., & Mustadi, A. (2021). Pandemic pedagogy in the era of digital transformation. *ACM International Conference Proceeding Series*, 30, 1-7. <https://doi.org/10.1145/3516875.3516911>
- Amrita, P. D., Haroky, F., & Kuswanto, H. (2020). Developing local wisdom-based mobile science learning in manufacturing sasirangan fabric to improve ICT literacy facility of junior high school students. In H. Habiddin, S. Majid, I. Suhadi, N. Farida, & I. W. Dasna (Eds.), *AIP Conference Proceedings*, 2215 (1), 040002. <https://doi.org/10.1063/5.0000684>
- Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959–975. <https://doi.org/10.1016/j.joi.2017.08.007>
- Aria, M., Le, T., Cuccurullo, C., Belfiore, A., & Choe, J. (2023). OpenalexR: An R-tool for collecting bibliometric data from openalex. *R Journal*, 15(4). <https://doi.org/10.32614/RJ-2023-089>
- Atmojo, S. E., Rusilowati, A., Dwiningrum, S. I. A., & Skotnicka, M. (2018). The reconstruction of disaster knowledge through thematic learning of science, environment, technology, and society integrated with local wisdom. *Jurnal Pendidikan IPA Indonesia*, 7(2), 204–213. <https://doi.org/10.15294/jpii.v7i2.14273>
- Bancong, H. (2024). The past and present of thought experiments' research at glancy: Bibliometric review and analysis. *Discover Education*, 3(142). <https://doi.org/10.1007/s44217-024-00246-z>
- Dwiningrum, S. I. A., Sumunar, D. R. S., Haryanto, Sitompul, N., Setyawan, S. L. H. P., Sholekhah, E., Aswasulasikin, & Nahdi, K. (2021). Student knowledge about disaster in vocational school and high school: A case study in Lombok, Indonesia. *IOP Conference*

Series: Earth and Environmental Science, 630(1), 012020. <https://doi.org/10.1088/1755-1315/630/1/012020>

- Eck, N. J. V., & Waltman, L. (2017). Citation-based clustering of publications using CitNetExplorer and VOSviewer. *Scientometrics*, 111, 1053–1070. <https://doi.org/10.1007/s11192-017-2300-7>
- Huda, M., Saeful, A., Rahim, H., Rosyada, D., Zuhdi, M., & Muttaqin, S. (2024). The implementation of multicultural education in Indonesia: Systematic literature review. In Rahiem, M.D.H. (Ed.), *Religion, Education, Science and Technology towards a More Inclusive and Sustainable Future: Proceedings of the 5th International Colloquium on Interdisciplinary Islamic Studies (ICIIS 2022)*. <https://doi.org/10.1201/9781003322054-13>
- Kurniawan, H. D., & Kuswanto, H. (2021). Improving students' mathematical representation and critical thinking abilities using the caka media based on local wisdom. *International Journal of Interactive Mobile Technologies*, 15(2), 72–87. <https://doi.org/10.3991/ijim.v15i02.11355>
- Lestari, W., Dwiningrum, S. I. A., Azhari, I., & Damanik, I. H. (2025). Evaluating the effectiveness of local wisdom-based disaster mitigation education in primary schools. *Edelweiss Applied Science and Technology*, 9(5), 2074–2091. <https://doi.org/10.55214/25768484.v9i5.7380>
- Martawijaya, M. A., Haris, A., Hasyim, M., & Wahdah, N. (2024). Affirmation the dimension of physics literacy of local wisdom-based in SMAN 3 Wajo. In R. A. Razak, A. M.M.A.B., S. Z. A. Rahim, M. F. Rosli, J. S, & M. F. M. Tahir (Eds.), *AIP Conference Proceedings*, 2799(1), 020125. <https://doi.org/10.1063/5.0182058>
- Martawijaya, M. A., Rahmadhanningsih, S., Swandi, A., Hasyim, M., & Sujiono, E. H. (2023). The effect of applying the ethno-stem-project-based learning model on students' higher-order thinking skill and misconception of physics topics related to lake Tempe, Indonesia. *Jurnal Pendidikan IPA Indonesia*, 12(1), 1–13. <https://doi.org/10.15294/jpii.v12i1.38703>
- Maulana, A., Subyantoro, S., Yuniawan, T., & Pristiwati, R. (2024). Development of electronic media assisted language learning modules with cultural literacy. *Ingenierie Des Systemes d'Information*, 29(4), 1283–1295. <https://doi.org/10.18280/isi.290404>
- Nanda, A. R., Nurnawaty, Mansida, A., & Bancong, H. (2025). A bibliometric analysis of trends in rainfall-runoff modeling techniques for urban flood mitigation (2005–2024). *Results in Engineering*, 26, 104927. <https://doi.org/10.1016/j.rineng.2025.104927>
- Patras, Y. E., Japar, M., Rahmawati, Y., & Hidayat, R. (2025). Integration of culturally responsive teaching approach, local wisdom, and gamification in pancasila education to develop students' multicultural competence. *Educational Process: International Journal*, 14, e2025045. <https://doi.org/10.22521/edupij.2025.14.45>
- Rahmasari, A., & Kuswanto, H. (2023). The effectiveness of problem-based learning physics pocketbook integrating augmented reality with the local wisdom of catapults in improving mathematical and graphical representation abilities. *Journal of Technology and Science Education*, 13(3), 886–900. <https://doi.org/10.3926/jotse.1962>
- Saaduddin, S., Novalinda, S., Alamo, E., Laksono, M. A., & Pramayoza, D. (2024). Traditional dramaturgy of the si muntu performance as a means of character education. *Revista de Gestao Social e Ambiental*, 18(9), e06577. <https://doi.org/10.24857/rgsa.v18n9-073>
- Sadijah, C., Anwar, L., Hidayah, I. R., Abdullah, A. H., & Cahyowati, E. T. D. (2024). Mathematics Learning Models Based on Local Wisdom of Malang to Support Critical and Creative Thinking of Secondary School Students. In D. Rahmadani, A. D. Utami, I. Rofiki, A. D. Pahrany, L. W. Aeli, M. Solikhin, & R. F. Suwarman (Eds.), *AIP Conference Proceedings* 3235 (1), 030025. <https://doi.org/10.1063/5.0234944>

- Sari, P. F., Nikmah, S., Kuswanto, H., & Wardani, R. (2020). Development of physics comic based on local wisdom: Hopscotch (engklek) game android-assisted to improve mathematical representation ability and creative thinking of high school students. *Revista Mexicana de Fisica E*, 17(2), 255–262. <https://doi.org/10.31349/RevMexFisE.17.255>
- Setiadi, H. W., Dwiningrum, S. I. A., & Mustadi, A. (2023). Portrait of ecoliteracy competence in elementary school students: Relationship of ecoliteracy competence on environmental sustainability in indonesia. *Environment and Ecology Research*, 11(6), 993–1001. <https://doi.org/10.13189/eer.2023.110610>
- Suparman, S., La'ia, H. T., Makur, A. P., Turmudi, T., Juandi, D., Helsa, Y., & Masniladevi. (2024). Development of using sumput digital game to stabilize students' achievement emotions in mathematics. *Qubahan Academic Journal*, 4(4), 156-177. <https://doi.org/10.48161/qaj.v4n4a808>
- Suyasa, W. A., P., Divayana, D. G. H., Ariawan, I. P. W., Andayani, M. S. L., Wiradika, I. N. I., & Adiarta, A. (2025). Field trial of Provus-Alkin-amalgamation evaluation application based on Weighted-Product-Rwa-Bhineda mods. *Journal of Education and Learning*, 19(1), 495–505. <https://doi.org/10.11591/edulearn.v19i1.21114>
- Triastari, I., Dwiningrum, S. I. A., & Rahmia, S. H. (2021). Developing disaster mitigation education with local wisdom: Exemplified in Indonesia schools. In A. Shafie, bin I. H, N. Nayan, E. Vannamettee, P. Cheewinsiriwat, Y. Lopez, M. null, & S. R. Giyarsih (Eds.), *IOP Conference Series: Earth and Environmental Science*, 884(1), 012004. <https://doi.org/10.1088/1755-1315/884/1/012004>
- Visser, M., van Eck, N. J., & Waltman, L. (2021). Large-scale comparison of bibliographic data sources: Scopus, Web of Science, Dimensions, Crossref, and Microsoft Academic. *Quantitative Science Studies*, 2(1), 20–41. https://doi.org/10.1162/qss_a_00112
- Wijayanti, Y. (2025). Enhancing students' cultural identity through history education based on local wisdom of Kagaluhan values. *Educational Process: International Journal*, 14, e2025075. <https://doi.org/10.22521/edupij.2025.14.75>

About the Authors

	Syamsidar Saleng, S.Pd., M.Pd is a doctoral student in the Education Study Program at Universitas Muhammadiyah Makassar. She earned her master's degree in physics education from Universitas Negeri Makassar, Indonesia. Her research interests include the development of educational technology, particularly the integration of Learning Object Materials into Learning Management Systems (LMS) to support digital-based instruction. She also focuses on the design and development of interactive student worksheets for high school students. In addition, her work explores the integration of local wisdom into teaching practices, aiming to contextualize learning and strengthen cultural relevance in the classroom. Email: syamsidars@unismuh.ac.id ORCID ID: https://orcid.org/0009-0000-9980-2211
	Dr. Ishaq, S.Pd., M.Pd. is a lecturer in the Physics Education Department, Universitas Muhammadiyah Makassar, Indonesia. He obtained his doctoral degree in Educational Technology from Universitas Negeri Malang. His research focuses on learning technologies, particularly the development of ICT-based media to enhance the effectiveness of physics instruction. He promotes a heutagogical approach to foster student independence and actively develops innovative instructional materials such as visual media and computer-based applications. He is also engaged in research on teacher competencies in relation to teacher certification. Email: ishaqmadeamin@unismuh.ac.id ORCID ID: https://orcid.org/0000-0003-2983-2532
	Prof. Dr. Eny Syatriana, M.Pd. is a professor in English Education Department, Universitas Muhammadiyah Makassar, Indonesia. She earned her doctoral degree in English Education from Universitas Negeri Makassar. Her research focuses on literacy development in English language learning and contextual, competency-based curriculum design. She is particularly interested in integrating reading, writing, and digital literacy into English instruction, developing literacy-based teaching materials, and designing curricula that promote active, communicative, and needs-based learning. Email: enysatriana@unismuh.ac.id ORCID ID: https://orcid.org/0000-0002-4412-9186