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A Bibliometric Analysis of Writing Skills in Elementary Education: Trends, Research Gaps, and Directions for Expository Writing, PWIM, and Environmental Literacy

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Elementary school,
PWIM,
Literacy environment,
Learning to write

Abstract

This study aims to analyze trends, structures, and intellectual directions in the development of study-learning writing texts in elementary school through a bibliometric approach. Research data were obtained from 308 Scopus-indexed articles published between 2016 - 2025 and analyzed using *Bibliometrix* and *Biblioshiny*. The results show a significant increase in publications; however, it is still dominated by general themes, such as *writing skills* and basic literacy, so that Not yet Lots leads to the specification of the expository text genre. Keyword analysis and thematic mapping reveal the existence of three main clusters, namely literacy basics, technology education, and aspects psychopedagogical, which are still naturally fragmented. In addition, research finds that the use of innovative learning models, especially *the Picture Word Inductive Model* (PWIM), remains very limited, and the integration of a literacy environment has not yet become a main focus in studies of writing. Among global contributors, countries such as Turkey, Indonesia, and the United States are the most productive, even though international collaboration remains low. Research has identified a gap between quantitative and qualitative substantive research, particularly regarding genre-based differentiation, learning model innovation, and contextual relevance. Therefore, this research offers directions for development in the form of an integration approach, a genre-based PWIM model, and a literacy environment for learning to write multimodal, contextual, and transformative text exposition. These findings can contribute theoretically and practically to the development of learning and writing at school, more relevant to the demands of the 21st century.

1. Introduction

Writing is one of the main pillars of literacy and plays a strategic role in the development of cognitive, communication, and critical thinking skills (Graham et al., 2019). At the elementary school level, skills function not only as means of expression but also as a foundation for mastery of various disciplines (Bazerman et al., 2017). One of the most complex skills in writing is expository writing, which demands the ability to organize ideas into a logical, well-supported argument based on facts and build coherence in discourse (Hyland, 2019).

In a global context, attention to learning to write. Keep going, experience improvement, along with demands for 21st-century literacy (OECD, 2020). Data from Scopus shows a significant improvement in publication-related learning writing, especially in basic education. However, some large-scale studies still focus on common writing skills and have not yet explicitly examined the development of expository writing as a specific academic genre.

From a pedagogical perspective, the use of structured learning models is an important factor in improving the effectiveness of writing instruction (Graham, 2018). One model with potential significance is the Picture Word Inductive Model (PWIM), which emphasizes using visual stimuli to develop vocabulary and construct inductive texts. This model was assessed as effective in supporting learning-based, concrete experiences, especially for elementary school students (Calhoun, 1999). Thus, the implementation of PWIM in context-based learning to write expository text has not yet been widely explored in empirical studies.

Apart from the learning model aspect, integrating literacy into the environment also becomes an issue in contemporary education. The literacy environment is not only knowledge-oriented but also encompasses dimensions, attitudes, and actions for a sustainable environment (Isquith et al., 2015; UNESCO, 1977). The integration of a thematic environment into writing instruction can increase the

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relevance of learning while fostering students' awareness. However, studies that integrate the learning of expository writing with a literacy environment remain very limited.

For understanding comprehensive development and direction study in this field, an analytical data-based analysis, bibliometrics allows mapping the structure of knowledge, identification of trends, as well as exploration of the gap study systematically (Donthu et al., 2021). With a tool like Bibliometric Analysis, the relationship among concepts, authors, and theme studies can be visualized more deeply.

Although studies on writing skills in elementary school have developed quickly, many large-scale studies still focus on descriptive approaches or on testing the effectiveness of learning models, partially. Until now, there has been no comprehensive research framework that integrates intellectual dynamics and thematic aspects, and there is a conceptual gap in understanding how to write expository texts using a bibliometric approach. In addition, integration among the approach genre-based learning model, innovative approaches such as the Picture Word Inductive Model (PWIM), and the literacy environment has not yet been analyzed within a single systematic framework. Therefore, this research contributes by combining science mapping-based bibliometric analysis to identify patterns of development, thematic structure, and the direction of transformation in study learning and in writing that is more integrative, contextual, and multidimensional.

Based on the background behind said, this research aims to: (1) analyze the trend of publication learning writing at elementary school, (2) identify the structural theme of research, and (3) reveal the gap in the study related to the integration of PWIM and the literacy environment in learning to write text exposition.

Literature review

Study on writing skills in education base No can be released from various runway theoretical explanations, essentially writing as a complex, multidimensional, and contextual process. From a cognitive perspective, writing is understood as a mental process that involves a series of high-level thinking activities, such as planning, organizing ideas, translating ideas into language, and ongoing recursive revisions. The model developed by Linda Flower and John R. Hayes emphasizes that writing is not a linear process but rather a dynamic, problem-solving activity influenced by interactions among memory term length, context tasks, and the writer's communicative objectives. Development is the latest in theory; this also emphasizes the importance of regulation, self, and metacognitive strategies in increasing the quality of writing, so that learning to write needs to be designed to push awareness and reflective students into the thinking process (Flower et al., 1981; Graham et al., 2019).

On the other hand, the constructivist social perspective views writing as a practice inseparable from context, interaction, and culture. According to Lev Vygotsky (1978), understanding is language-mediated and develops through social interaction. In this context, learning to write focuses not only on the product-focused end but also on the collaborative process, discussion, and possible return; students build meaning together (Hyland, 2019). Thus, writing becomes a means of negotiation, involving social, cultural, and contextual dimensions.

Furthermore, genre theory provides a more framework-specific framework for understanding practice writing as goal-oriented, communicative, and socially conventional activities. Every type of text, including expository text, has a structure, rhetoric, and characteristics that are linguistically distinctive and necessary for students to understand so that they can produce effective writing (Hyland, 2019). An approach that is genre-based allows teachers to explicitly teach the structure of text, communicative functions, and use appropriate language, so that they can increase the quality of student writing significantly (Derewianka & Jones, 2016). In this context, learning to write expository text becomes important because it helps students compile an argument that is logical, systematic, and grounded in facts.

Different from the oriented approach structure, theory expressivism emphasizes writing as a means of expressing oneself and personal reflection. Approach: This gives room for students to develop their individual voice, creativity, and emotional involvement in writing (Elbow, 1973). Although often associated with a creative approach to writing, this is still relevant in an educational setting because it can increase students' motivation and intrinsic motivation. However, in an academic context, expressivism needs to be integrated with the cognitive approach and genre to produce writing that is not only expressive but also structured and communicative.

Besides the theoretical runway study, writing skills also include the ability to write what is necessary, developed in students. Skills write: No single nature, but rather consists of various types like narrative, expository, persuasive, descriptive, creative, analytical, academic, and technical writing. Narrative functioning for developing ability storytelling and imagination students, while writing exposition demands the ability to think logically and systematically in conveying information (Graham & Perin, 2007). Meanwhile, writing persuasively focuses on the ability to build convincing arguments, and writing

descriptively emphasizes the ability to describe objects in detail. On the other hand, writing that is analytical, academic, and technical demands a higher level of cognitive functioning because it involves the ability to analyze, synthesize, and use structured, formal language (Bailey, 2017). Diversity type skills. This shows that learning to write needs to be tailored to each type of text, in accordance with its purpose and characteristics.

In context-based implementation learning, the use of appropriate learning models is a key factor in increasing the effectiveness of writing instruction. Learning model functioning as a framework for the conceptual integration of goals, strategies, and activities, enabling systematic learning. One of the models that has relevance tall in learning writing at elementary school is *the Picture Word Inductive Model* (PWIM) developed by Calhoun (1999). This model uses visual stimuli, such as pictures, to help students identify vocabulary, build concepts, and gradually compile sentences and paragraphs. PWIM is based on the principle of constructivism, which emphasizes active, exploratory, and concrete learning experiences.

Further research shows that an approach that integrates learning with visual, contextual, and participatory elements can increase student involvement and improve the quality of their writing (Graham et al., 2019). In context education, 21st-century learning writing is also necessary, integrated with contextual issues, such as literacy environment, to increase relevance and meaningful learning. This integration allows students not only to develop linguistic skills but also to develop awareness of the environment and social life.

Question Study

Study this aim to analyze trends, structures, knowledge, and gaps in related learning, and write an expository text for an elementary school over the last decade (2016–2025). In addition, this research aims to identify potential developments in learning models based *on the Picture Word Inductive Model* (PWIM) and the integration of a literacy environment as a direction for future research.

RQ1 : How does the trend publication study relate to learning and writing text exposition at elementary school in the 2016–2025 period?

RQ2 : What are the most dominant keywords and how? What is the relevance of studying how to write text exposition at elementary school?

RQ3 : How to map thematic and cluster research that is formed in study learning, write text exposition based on the analysis of bibliometrics?

RQ4 : Which are the most influential authors, journals, and publishers in studying and writing text exposition at elementary school?

RQ5 : Which countries and institutions are the most productive? In studying how to write text exposition at an elementary school?

RQ6 : To what extent has the learning model, especially *the Picture Word Inductive Model* (PWIM), been used in the study of learning written text exposition?

RQ7 : How is the position and level integration of the literacy environment in the study of learning to write text exposition at the elementary school?

RQ8 : What is the gap? Research and direct future development in learning to write expository text that integrates PWIM and the literacy environment?

2. Method

Study this use quantitative, bibliometric-based analysis for map development, intellectual structure, and trend study in the field of learning; write expository text at the elementary school level. Analysis was conducted using the *Bibliometrix* and *Biblioshiny* packages in the *RStudio environment,* which enable systematic exploration of connections among keywords, authors, and thematic trends (Donthu et al., 2021).

2.1. Method 2 Sources and Search Strategy

Data obtained from the selected Scopus database is due to its own coverage breadth and credibility in the publication of international scientific publications. Search process done using the following formulation:

Table 1. Inclusion criteria for bibliometric analysis

Scopus Databae	**ALL**
Time period	2016-2025
Search Field	TITLE-ABS-KEY
Search Keyword	"expository writing" OR "expository text" OR "academic writing" OR "writing skill" OR "writing ability" AND "elementary school" OR "primary school" OR "primary education" OR "elementary education"

Document type	Article
Language	English

2.1.1. Procedure Data Selection

Stage identification, sample study. This consists of 308 articles, research sourced from the Scopus database. The search process is conducted using a Scopus account, where researchers experience limitations in access, so they cannot browse articles directly in the database and can only search by author.

Next, at the stage screening, carried *out* deletions, duplications, and reviews based on the title and abstract to ensure suitability for the research focus. In this process, as many as 308 articles were stated as relevant for the stage.

At the eligibility stage, the article was analyzed in greater depth based on the text, considering the set inclusion criteria, such as the type of publication, the relevance of the topic, and suitability for the basic educational context. Articles that do not fulfil the criteria are eliminated at this stage.

Stage end, namely inclusion, resulting in 308 articles used as the main dataset for the bibliometric analysis. The PRISMA diagram presented gives a description of the systematic process regarding the data selection process carried out in this study.

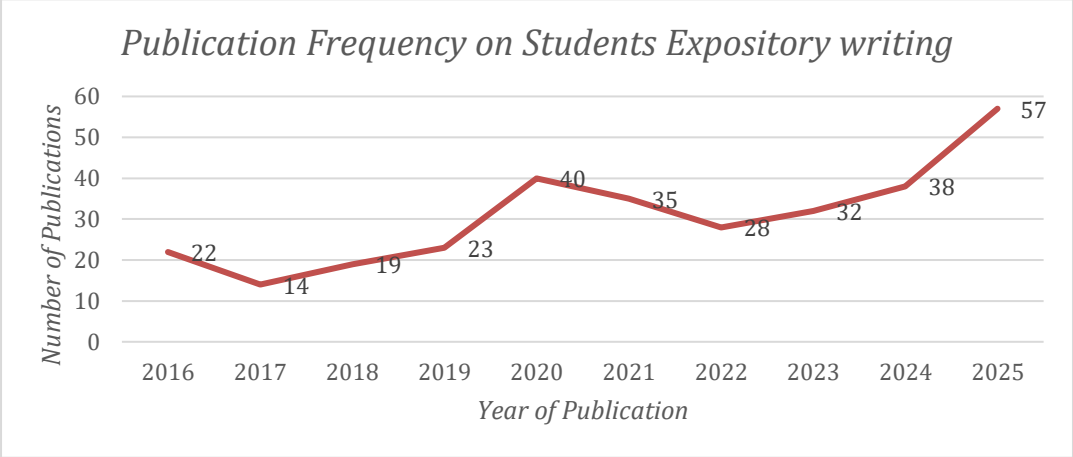


Figure 1. Number Publication about Skills Write Exposition Student

Table 2. Most Frequently Used Articles References

Publication Year	*Publisher*	*SJR*	*Best Q.*	*Document Title*	*Cited*
S. Wollscheid (2016)	*Computers and Education*	*4,424*	*Q1*	*"The impact of digital devices vs. Pen(cil) and paper on primary school students' writing skills - A research review"*	112
G.-J. Hwang (2020)	*British Journal of Educational Technology*	*3,380*	*Q1*	*"From experiencing to expressing: A virtual reality approach to facilitating pupils descriptive paper writing performance and learning behavior engagement"*	108
H.Ç. Sarica (2016)	*Computers and Education*	*4,424*	*Q1*	*"The effect of digital storytelling on visual memory and writing skills"*	100
F. De Smedt (2016)	*Reading and Writing*	*1,206*	*Q1*	*"Student, teacher and class-level correlates of Flemish late elementary school children's writing performance"*	91
De Smedt, Fien (2017)	*Reading Research Quarterly*	*1,592*	*Q1*	*"Cognitive and Motivational Challenges in Writing: Studying the Relation With Writing Performance Across Students' Gender and Achievement Level"*	76

Publication Year	*Publisher*	*SJR*	*Best Q.*	*Document Title*	*Cited*
C.-N. Liao (2016)	*Computers and Education*	*4,424*	*Q1*	*"The effect of online summary assessment and feedback system on the summary writing on 6th graders: The LSA-based technique"*	61
M. Li (2022)	*British Journal of Educational Technology*	*3,830*	*Q1*	*"Promoting deep writing with immersive technologies: An SVVR-supported Chinese composition writing approach for primary schools"*	58
A. Yamaç (2016)	*International Electronic Journal of Elementary Education*	*0.284*	*Q3*	*"The effect of digital storytelling in improving the third graders writing skills"*	53
Kirnan & Wong (2016)	*Early Childhood Education Journal*	*0.961*	*Q1*	*"The Impact of a Therapy Dog Program on Children's Reading Skills and Attitudes toward Reading"*	51
J. Bonaventure (2021)	*International Journal of Education and Practice*	*0.226*	*Q3*	*"Using Padlet as a Technological Tool for Assessment of Students Writing Skills in Online Classroom Settings"*	46

Table 3. 10 Publishers about Skills Write Exposition Student

Sources	*Articles*
Reading and Writing	13
Education And Information Technologies	7
Communication Sciences And Disorders	6
Computers and Education	6
International Electronic Journal Of Elementary Education	5
Universal Journal Of Educational Research	5
Education Sciences	4
Frontiers in Education	4
International Journal Of Bilingual Education And Bilingualism	4
International Journal Of Instruction	4

Table 4. Productive Countries about Skills Write Exposition Student

Country	Freq
Turkey	61
Indonesia	57
USA	57
Spain	49
China	42
Malaysia	28
Australia	23
Chile	15
United Kingdom	15
Italy	13

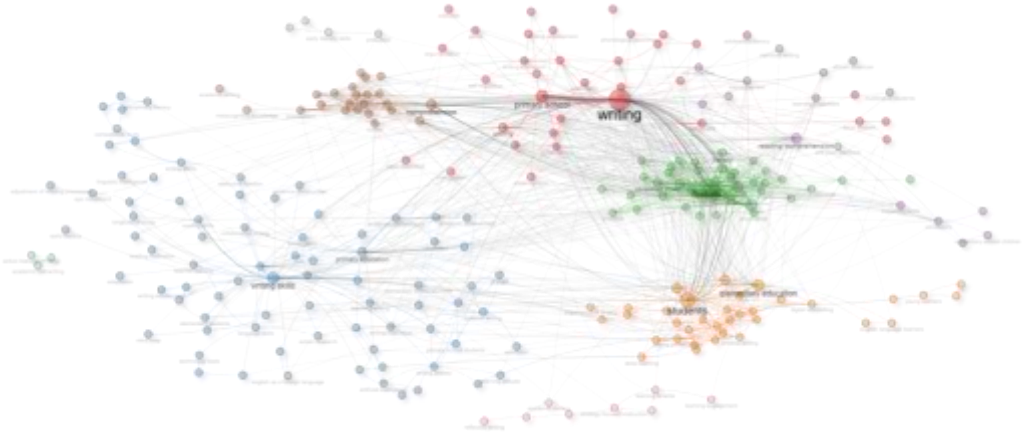


Figure 2. Keyword Relationships in Research Articles Skills Write Exposition Student

Table 5. Most Used Keywords in Related Articles with Study Skills Write Exposition Student

Words	*Occurrences*
writing	56
writing skills	35
primary school	27
primary education	21
reading	19
reading comprehension	18
students	17
elementary school	16
elementary education	15

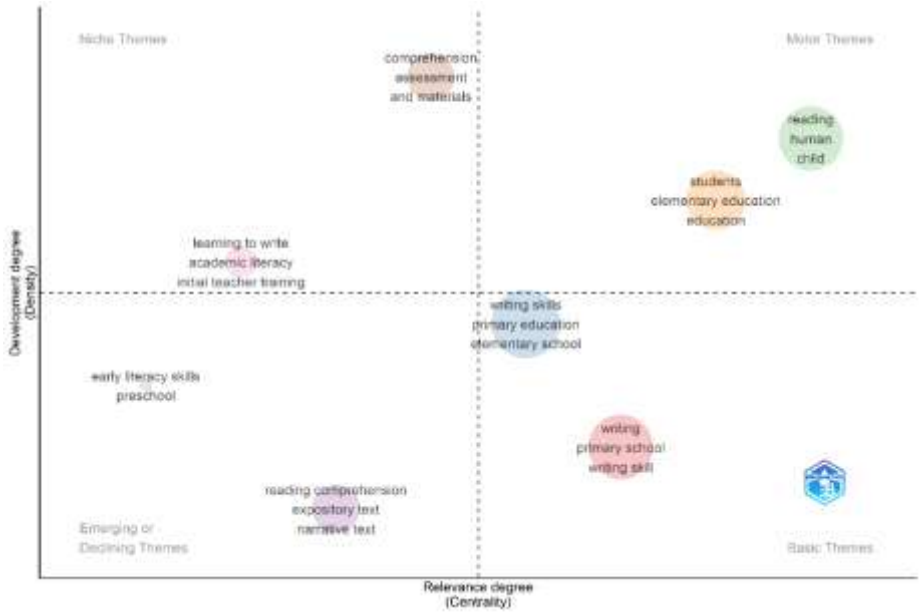


Figure 3. Thematic Map Study Skills Writing in Elementary Education Based on Analysis Bibliometrics

3. Results and Discussion

3.1. Publication Trends and Research Dynamics (RQ1)

Analysis results of bibliometrics show a significant improvement in the number of publications related to learning and writing at elementary school over the last decade. Findings: This indicates that writing skills are positioned as a competence essential to the 21st-century framework of literacy, which functions not only as a means of communication but also as a medium for constructing knowledge and developing critical thinking. Improvement. This is in line with a global agenda that places literacy as an indicator of the main quality of education (OECD, 2020). In a quantitative way, trend publications show a relatively linear growth pattern with significant improvement post-2020. Phenomenon: This can be associated with accelerated digital transformation in education during the COVID-19 pandemic, which prompted exploration of various approaches to learning-based technology, including those in writing instruction. However, the increased quantity of publications does not automatically reflect depth or innovation in research approach. Analysis more clearly shows that growth tends to be linear and not yet accompanied by a transformational paradigm in learning writing. In other words, even as the number of studies increases, their development remains within the framework of conventional conceptual frameworks. This indicates stagnation in epistemology, where research replicates the same approach. There is a need to develop a newer, contextual, and adaptive model or framework.

3.2. Keywords Dominance and Structure Relatedness (RQ2)

Analysis frequency and co-occurrence of keywords show that the term "writing" is the most dominant keyword, followed by "writing skills", "primary school", and "reading comprehension". The study still focused on strengthening students' literacy base, particularly in the context of context-based education. Structure-relatedness between keywords indicates a strong relationship among skills, reading, and writing. This indicates that learning to write exposition cannot be separated from the ability to understand text, so that both of them form A unity of competence literacy academic findings. This strengthens the perspective that writing exposition is a complex cognitive process involving integration, understanding, analysis, and production of text. On the other hand, the limitations of keyword variations show that the exploration topic study is still relatively narrow. Related keywords with innovation pedagogical, such as learning models, certain or approach-based context, are still not yet dominant. This indicates an opportunity to expand the coverage study in a more directed, contextual, and innovative direction.

3.3. Thematic and Cluster Maps Research (RQ3)

Based on field analysis, mapping, thematic, and structural studies, this is divided into several clusters, with a main focus that reflects the evolving domain of study. Referring to the approach *of science mapping* (Donthu et al., 2021), clusters can be categorized as follows:

1. Cluster literacy basics, which focuses on skills writing and reading as the foundation for the main learning.
2. Cluster technology education, which includes the use of digital media such as *digital storytelling* and *virtual reality.*
3. Cluster psychopedagogical, which highlights aspects of students' motivation, involvement, and cognitive factors.

Based on the visualization map's thematic structure, research can also be understood through four main themes, namely *motorbike themes, basic themes, niche themes,* and *emerging or declining themes.* In the *motor themes quadrant,* themes like *reading, students, child,* and *elementary education* show a high level of centrality and density, indicating that study in this area has matured and become a driving force in field study. This indicates that writing skills at school are closely related to the development of reading and to the characteristics of educated participants.

In the quadrant *of basic themes,* themes like *writing, writing skills,* and *primary school* own-level relevance are tall but have relatively low density. Condition: This shows that themes become the foundation of the main research; it still needs further development to carry on the conceptual and methodological. While that, quadrant *niche themes* filled by themes like *academic literacy, learning to write,* and *initial teacher training,* which have level development tall but relatedness low, so that tend to be specialists and not yet integrated widely in network study. As for the quadrant *of emerging or declining themes,* themes such as *early literacy skills, preschool,* and related *reading* comprehension with *expository* and *narrative texts* are still developing or may decline. Although the themes remain relevant as a basis for developing writing skills, especially in the context of beginning literacy.

Thematic maps show that the cluster literacy base remains theme-dominant (*motor themes*), while the cluster technology starts to develop as theme potential (*emerging themes*). However, integration between clusters remains limited, so the study is somewhat partial. In a way, overall, results map the thematic. This strengthens the findings that study skills writing in elementary school is still dominated by basic, general themes, with limited integration among aspects of literacy, pedagogy, and innovative learning. This is a big opportunity for developing further research, integrative and multidimensional, especially with connected skills, writing, understanding, reading, and an innovative approach to learning in A conceptually complete framework. Findings: This indicates that the field study is still in the stage of developing a field, where *opportunities* for integrating multidisciplinary approaches are still wide open. Therefore, it is necessary to conduct research that more comprehensively integrates the cognitive, pedagogical, and contextual aspects.

3.4. Most Influential Authors, Journals, and Publishers (RQ4)

Analysis citation shows that the most influential articles are generally related to integration technology in learning writing, such as using *digital storytelling* and *virtual reality.* The number of citations in articles shows that innovation-based technology has a significant impact on development studies. Among the side-source publications, journals such as *Reading and Writing, Education and Information Technologies,* and *Computers & Education* are the main contributors in this field. Domination journals show that studying learning and writing exposition is on the slice between field literacy and technology education. Findings. This is in line with the draft *intellectual structure* in bibliometrics (Donthu et al., 2021), which emphasizes the importance of analyzing sources and citations in understanding the development of a field of science. Thus, it can be concluded that developments influence the direction of this trend in educational technology.

3.5. Most Productive Countries and Institutions (RQ5)

Analysis results show that Turkey, Indonesia, and the United States make the largest contributions to publications. Indonesia's contribution shows an improvement in attention to developing literacy in elementary school in the national context. However, international collaboration is still relatively limited, which is indicated by the low level of co-authorship across countries. According to Donthu et al. (2021), international collaboration is an important indicator of increased research quality and impact. Therefore, the increase in network collaboration is both a challenge and an opportunity for the development of research in this field.

3.6. Use of the PWIM Learning Model (RQ6)

Analysis shows that the use of learning models, especially *the Picture Word Inductive Model* (PWIM), remains very limited in the study of expository writing. Most studies still use general approaches, such as *process writing* and *genre-based approaches.* In fact, theoretical PWIM has the potential to help students develop ideas through visual stimuli and enrich vocabulary. Lack of research related to PWIM shows an existence gap between potential theoretical and implementation empirical in context learning write exposition.

3.7. Literacy Integration Environment (RQ7)

Analysis results show that the integration of a literacy environment into the study of writing expository texts is still very limited. Related keywords with environmental literacy or ecoliteracy almost do not appear in the map's bibliometrics. Findings. This shows that the study still focuses on general aspects of writing skills without linking them to global contextual issues. In fact, expository text has its own potential as a medium for developing students' critical awareness of environmental issues.

3.8. The gap Research and Future Directions (RQ8)

Based on the overall results analysis, there are a number of gaps in this study. First, there is an imbalance between growth and innovation in research. Second, the use of learning models, such as PWIM, remains limited. Third, the integration literacy environment has not yet become the main focus of research. Fourth, international collaboration is still low.

Referring to the framework, *future research directions* in studies of bibliometrics (Donthu et al., 2021), future research can focus on:

1. development of learning models, innovative PWIM-based,

2. integration literacy environment in learning to write exposition,
3. utilization of digital technology in contextual, and
4. strengthening collaboration, multidisciplinary, and international.

Thus, future research is expected to produce contributions that are not only nature descriptive but also transformative in the development of learning and writing at the school level.

4. Conclusion

Analysis results of bibliometrics to study learning write text exposition at elementary school, the period 2016–2025, show that development publication experience consistently improves, but is not yet fully accompanied by progress in conceptual and innovation significant pedagogical perspectives. Referring to the perspective analysis of bibliometrics that emphasizes not only productivity but also the structure of intellectual and thematic domains (Donthu et al., 2021), the study's findings reveal several crucial points:

Findings map the thematic strengthening results of the study. Still dominated by *basic themes* like *writing* and *writing skills* that have relevance tall. However, the conceptual framework is not yet developed, whereas *motorcycle themes* are more developed. Lots are dominated by general issues like *reading* and the characteristics of students. On the other hand, important themes like teacher training, literacy, and literacy beginning are still in their niches and *emerging,* which shows that there is not yet optimal integration across research domains.

First, the dominant themes and limitations of the focus study remain clear. The study is dominated by the theme of general *writing skills,* literacy, and learning language, which shows that the study is still at the macro level and not yet. Lots lead to genre specifications, in particular, text exposition. In fact, from a genre pedagogy perspective, each type of text has its own characteristics, rhetoric, structure, and demands different cognitive skills (Hyland, 2019). Conditions: This indicates that learning to write is not yet fully oriented toward developing competence in specific, context-dependent communication.

Second, fragmentation in the use of learning models becomes important to others. Learning models, innovative like *the Picture Word Inductive Model* (PWIM), are still very limited in their use and not yet integrated systematically in map research. This shows that the development of learning models remains sporadic and has not yet established a strong tradition of scientific knowledge. In fact, PWIM has potential big in supporting learning, writing visually and constructivist-based, which is appropriate with the characteristics of cognitive students in elementary school (Calhoun, 1999). Thus, there is a gap between the potential theoretical and the empirical implementation of the learning model.

Third, integration of a literacy environment in learning to write text exposition is still very minimal. Findings: This shows an existence mismatch between the global demands of education and the existing practice in research. In the framework *of Education for Sustainable Development,* the literacy environment should become an integral part of the learning process, including the development of speaking skills (UNESCO, 2020). Limitations: This indicates that learning to write is still not yet fully contextual and relevant to real-life issues for students.

In a way, the overall findings of this study confirm the existence of a gap between the development of quantitative and qualitative substantive research, which includes limitations in genre differentiation, low exploration of innovative learning models, and a lack of integration of the context and literacy environment.

In addition, based on the distribution theme in the map thematic, it is visible that integration between skills, reading, writing, and pedagogical innovation is still not yet systematic. Condition: This shows that the direction of study is to move from a partial approach to a more integrative and multidimensional approach.

Based on the findings, this research gives significant theoretical and practical implications. theoretical, required development framework, conceptual integration approach, genre-based learning model, innovative, such as PWIM, and literacy environment in one comprehensive unity. Through a practical results study, this opens an opportunity to design multimodal, contextual, and student-centered learning models for writing exposition, so that not only do they increase writing skills but they also develop critical and ecological awareness.

Thus, research contributes not only to mapping the existing research landscape but also offers a direction for the development of a more strategic and transformative approach to innovation learning and writing at the school level in the future.

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All authors have equal contributions to the paper. All the authors have read and approved the final manuscript.

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