

# Bibliometric Mapping of Global Research Trends in Curriculum Integration Education

**Shidiq Agung Sutrisno**

Department of Islamic Religious Education, Faculty of Tarbiyah and Teacher Training, Yogyakarta State Islamic University, Yogyakarta, Indonesia

Jl. Laksda Adisucipto, Papringan, Caturtunggal, Depok District, Sleman Regency, Special Region of Yogyakarta 55281

**Corresponding author**

[shidiqagungsutrisno33@gmail.com](mailto:shidiqagungsutrisno33@gmail.com)

**Abstract:** This research aims to map the development and research trends in "curriculum integration education" through an analysis of Scopus-indexed publications. A bibliometric methodology was employed to examine all relevant literature within the Scopus database from 1946 to 2026. The data were analyzed using Excel for statistical purposes and R/R-Studio alongside VOSviewer for keyword co-occurrence and citation network visualizations. The results, derived from 11,607 publications that satisfied the inclusion criteria, reveal a substantial annual growth rate of 13.99%, with a peak in scholarly output observed in 2025. Analysis by country affiliation established the United States as the leading contributor to the field. At the individual level, the most productive researchers were identified as Kustati and Moore, T.J. It is important to acknowledge the study's limitation of relying solely on Scopus data, thereby excluding potential insights from other databases. Nonetheless, this investigation provides a comprehensive overview of the domain, offering valuable insights for academics interested in curriculum integration education. The findings elucidate the field's dynamic growth and intellectual structure, thereby establishing a foundation for recommending focused and informed directions for future research.

**Keywords:** Bibliometric Mapping, Curriculum Integration Education, Network Analysis, Research Trends, Scopus.

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## Introduction

The 21st-century globalization era demands the education sector to adapt to social dynamics (Ul Hassan, Murtaza, and Rashid 2025), technological advancements, and increasingly complex labor market demands (Wolhuter and Niemczyk 2023). The main challenge faced is producing graduates who not only possess deep disciplinary mastery but also have critical and creative thinking skills (Patel, Pua, and Kok 2024), and the ability to solve multidimensional problems (Anggraeni et al. 2023). In response to this challenge, educators and policymakers are transforming the curriculum approach paradigm from an isolated and rigid model towards a more holistic and contextual approach (Hamami and Nuryana 2022).

The concept of curriculum integration has emerged as a strategic innovation (Moss and Godinho 2019). In essence, curriculum integration is

an effort to connect and unify various disciplines by breaking down traditional barriers between subjects (Sun et al. 2023). The goal is to ensure that knowledge is no longer fragmented but becomes a unified whole that is meaningful and relevant to students' real lives (Schroeder 2022). Its manifestations are highly diverse, ranging from simple models such as the connected curriculum to complex approaches like the transdisciplinary approach, which examines real-world issues, as seen in the STEAM approach and Education for Sustainable Development (Baumber 2022).

Along with the strengthening discourse on curriculum integration (Perales and Aróstegui 2024), the volume of academic research in this field has also experienced significant growth (Roehrig et al. 2021). Thousands of scientific publications have been produced to explore its effectiveness, implementation models, and application challenges (Wang et al. 2023). However, this academic

information explosion has created new challenges for researchers and practitioners (Handley et al. 2025). It has become increasingly difficult to obtain a comprehensive overview of the development of this field of study, including identifying research trends, key actors, and untouched knowledge gaps (Lautenschlager and Tzempelikos 2021).

The researchers deemed that conventional narrative literature review methods are no longer adequate to handle the scale and complexity of such a large volume of publication data (Sukhera 2022). Therefore, a more systematic, objective, and measurable approach is required. Bibliometric analysis emerges as a powerful methodology for quantitatively mapping the intellectual landscape of a field of study (Donthu et al. 2021). Through co-occurrence keyword analysis, citation analysis, and network visualization techniques, this approach can reveal knowledge structures, trends, and collaboration patterns that are not easily identified manually (Du et al. 2024).

Although several bibliometric studies have touched upon general educational aspects, specific and in-depth mapping of the "Curriculum Integration Education" field remains very limited. It is this gap that forms the basis for conducting this research. Generally, this study aims to map the global research development and trends in "Curriculum Integration Education" through a comprehensive analysis of Scopus-indexed publications.

More specifically, the objectives of this study are to: (1) analyze temporal trends in publication growth; (2) identify main contributors based on country, institutional affiliation, and author; (3) map the intellectual structure and main research themes through keyword analysis; and (4) analyze collaboration patterns and the most influential documents.

To maintain focus and manageability, this research has several limitations. First, the data source relies solely on the Scopus database, thus publications from other repositories are not included. Second, the search strategy uses the specific key phrase "curriculum integration education," which may potentially miss variations in terminology. Third, the analysis is limited to English-language journal articles to ensure data consistency.

Nevertheless, this research is expected to provide significant benefits. For academics, the study results will present a comprehensive visual map to understand the research landscape and identify research gaps. For practitioners and policymakers, these findings can serve as data-driven considerations in curriculum development and teacher training programs. Overall, this research is expected to provide a clear roadmap for the future development of the "Curriculum Integration Education" field.

## Materials and Methods

This study employed a bibliometric analysis approach (Nobanee et al. 2021). Data were obtained using Boolean search operators to query the Scopus database for publications between 1927 and 2023. The search was conducted on 16 September 2025 at 10:15 WIB. Researchers utilized R and RStudio, VOSviewer, and Microsoft Excel to analyze citations, report content, and map networks (Lim and Kumar 2024).

The researcher employed 3 steps in processing the dataset.

Langkah ke-1, peneliti akan melakukan evaluasi literatur tentang topik terkait untuk memastikan studi yang relevan dilakukan pada mata pelajaran bibliometric (Lyu, Liu, and Yao 2023). Similarly, literature review is useful for determining appropriate key phrases that appear to represent the study's scope (Ninkov, Frank, and Maggio 2022).

Step 2, at this stage the researcher used the Boolean operator IDENTIFY-TITLE-ABS-KEY ("curriculum integration education") to search Scopus which yielded 8,017 documents. Then filtering was conducted with the Boolean operator TITLE-ABS-KEY ("curriculum integration education") AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (SUBJAREA, "SOCI")) AND (LIMIT-TO (LANGUAGE, "English")) to obtain the most relevant social technology articles in the form of journal article reports, where the source files are the best journals and most effective articles in English, producing a final report of 6,935.

Step 3, involved assessing the final document search results using the Scopus Analyzer tool and R

software along with RStudio (Khan et al. 2022). The objectives were to identify the consistent volume of documents over a 12-month period, categorize documents by journal, and identify authors, affiliations, countries, as well as specific contexts or disciplines. Subsequently, a community-level analysis of documents was conducted using visualization through VOSviewer (Huang et al. 2022), along with information processing using Microsoft Excel (Wang and Chai 2018). Complete details regarding this research procedure are presented in Figure 1.1 below:

Figure 1.1 Research Process

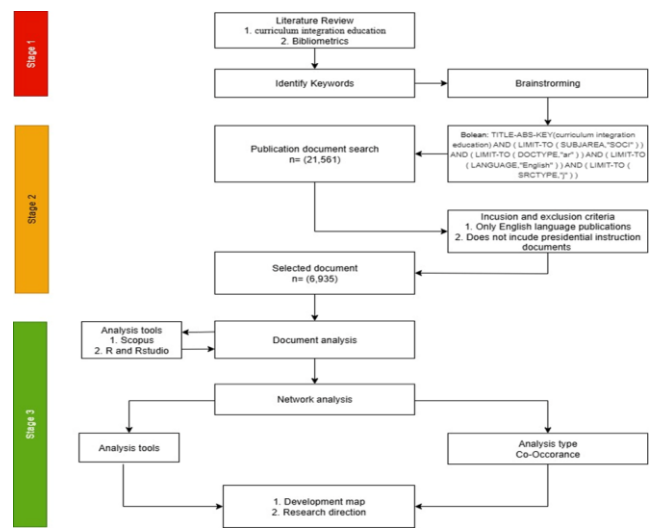


Table 1.1 provides an overview of the 6935 documents collected over 72 years. The dataset includes 29932 authors, 2 single-authored documents, 13.99% international co-authorship rate, and an average of 15.02 citations per document.

## Results and Discussion

### Result-1 (Document Analysis)

Table 1.1  
RESEARCH INFORMATION

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	1952:2026
Sources (Journals, Books, etc)	1454
Documents	6935
Annual Growth Rate %	1.5
Document Average Age	8
Average citations per doc	15.02
References	0
DOCUMENT CONTENTS	
Keywords Plus (ID)	7419
Author's Keywords (DE)	18685
AUTHORS	
Authors	29932
Authors of single-authored docs	2
AUTHORS COLLABORATION	
Single-authored docs	2
Co-Authors per Doc	9.7
International co-authorships %	13.99
DOCUMENT TYPES	
article	6935

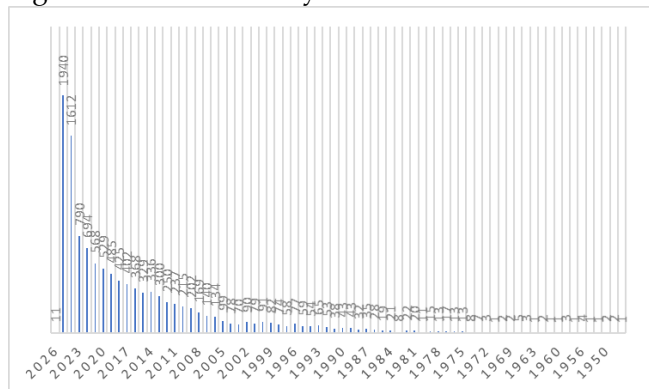
### Documents by Year

Figure 1.2 Documents by Year illustrates the publication evolution in "curriculum integration

education" research spanning the years 1946 to 2026. The initial publication appeared in 1946, followed by a period of stagnation from 1946 to 1972, before

demonstrating significant growth between 1973 and 2026. The data recorded a publication peak in 2025 with 1,940 scientific works, followed by a decline in 2026 with only 11 scientific works.

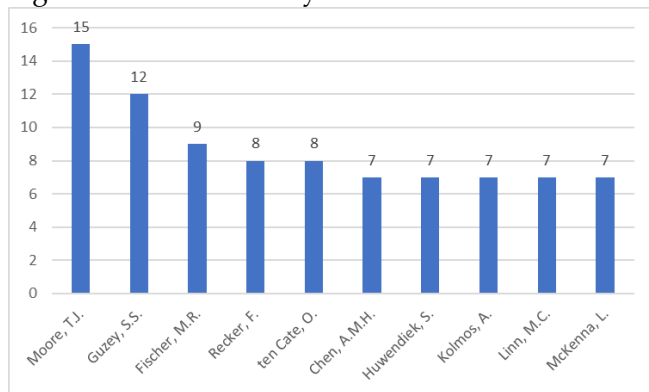
Figure 1.2 Documents by Year



Most Relevant Authors

Figure 1.3 illustrates the ten most influential authors in publications concerning "curriculum integration education." The data show that Moore, T.J. is the most productive author with 15 publications each. The next rank is occupied by Guzey, S.S. with 12 publications each, followed by Fischer, M.R. with 9 publications. Subsequently, Recker, F. and ten Cate, O. each contributed 8 publications, while Chen, A.M.H., Huwendiek, S., Kolmos, A., Linn, M.C., and McKenna, L. complete the list with 7 publications each.

Figure 1.3 Documents by Author



Documents by Affiliation

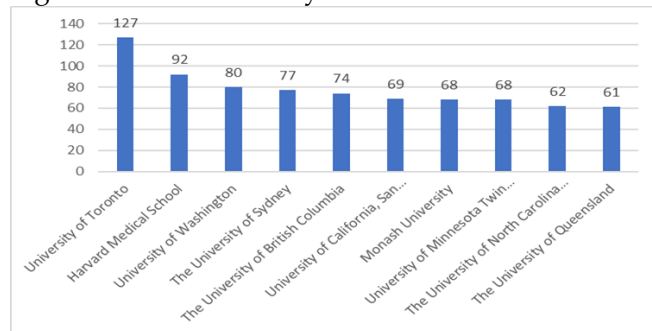
Figure 1.4 Documents by Affiliation presents an insightful overview of the ten most influential affiliations in publications addressing "curriculum integration education." The figure clearly shows the University of Toronto leading with 127 publications, underscoring this institution's significant contribution to advancing understanding of the

subject. Following closely, Harvard Medical School demonstrates notable prominence with 92 publications, indicating its crucial role in evaluation and principles-focused research. The University of Washington also makes substantial contributions with 80 publications, while The University of Sydney follows with 77 publications.

Further down the ranking, The University of British Columbia contributes 74 publications, followed by the University of California, San Francisco with 69 publications. Both Monash University and the University of Minnesota Twin Cities share the same publication count of 68, while The University of North Carolina at Chapel Hill and The University of Queensland complete the list with 62 and 61 publications respectively.

Figure 1.4 effectively illustrates the diverse distribution of remarkable contributions from various affiliations in developing knowledge about relevant evaluation methods and principles, thereby enhancing our comprehension of this academic domain.

Figure 1.4 Documents by Affiliation



Documents by Country

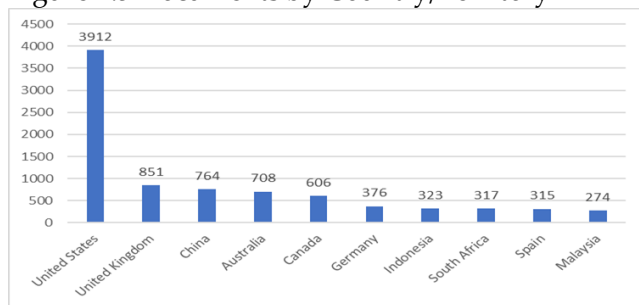
Figure 1.5 Documents by Country/Territory visualizes the publication distribution on the theme of "curriculum integration education" by country and continent. The data reveal that the United States dominates significantly with the highest number of publications, totaling 3,912 documents. The subsequent positions are occupied by the United Kingdom with 851 documents and China with 764 documents, solidifying the crucial role of these three countries in developing literature related to curriculum integration evaluation and principles.

Other countries making notable contributions include Australia (708 documents) and Canada (606 documents). Meanwhile, Germany and Indonesia also contributed with 376 and 323 documents

respectively. The participation of countries from other regions is also evident, such as South Africa with 317 documents and Spain with 315 documents, further affirming the global nature of research on this theme. Malaysia also participates in this academic discourse by producing 274 documents.

Overall, the figure illustrates a broad geographical distribution of publications, highlighting the key roles of various national and continental entities in advancing knowledge in the field of "curriculum integration education".

Figure 1.5 Documents by Country/Territory



Documents by Source

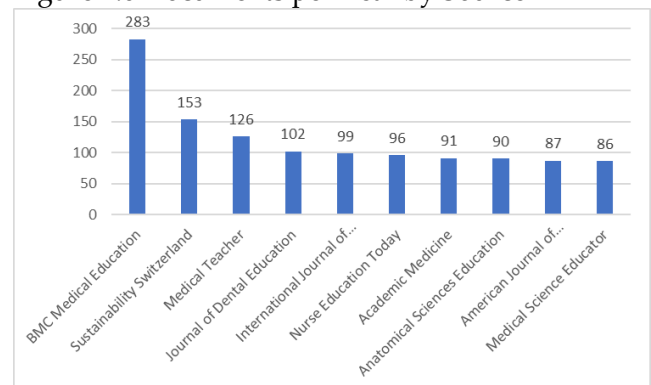
Figure 1.6 "Documents per year by source" provides a comprehensive overview of publication distribution patterns by source, focusing on the exploration of the "curriculum integration education" theme. In this publication landscape, BMC Medical Education leads with 283 documents, an outstanding achievement that solidifies its dominant role in the knowledge repository of medical education. The subsequent position is occupied by Sustainability Switzerland with 153 documents, demonstrating its strong commitment to the same literature. Significant contributions also come from Medical Teacher with 126 documents and Journal of Dental Education with 102 documents.

Furthermore, International Journal of Engineering Education contributes 99 documents, while Nurse Education Today adds 96 documents.

Academic Medicine follows with 91 documents, succeeded by Anatomical Sciences Education with 90 documents, American Journal of Pharmaceutical Education with 87 documents, and finally Medical Science Educator with 86 documents.

Figure 1.6 demonstrates that various sources from different continents play significant roles in advancing global understanding of "curriculum integration education," proving that this topic represents a shared concern that transcends geographical boundaries.

Figure 1.6 Documents per Year by Source



Most Global Cited Document

Data analysis revealed that the paper with the highest total citations is PA, 2012, COMPUT. EDUC. with 1,232 citations. Furthermore, among the studied papers, PA, 2012, COMPUT. EDUC. was identified as having the highest Tc per Year value of 88.00. Interestingly, the analysis results demonstrate a positive correlation between Total Citations (TC) and Tc per Year, indicating that papers with higher TC tend to have higher Tc per Year values as well. However, based on the available data, a clear relationship is observed between the paper's publication year and Total Citations (TC). This suggests that the publication year may significantly influence the number of citations a paper receives.

Table 1.2  
Most Globally Cited Documents

Paper	Total Citations	TC per Year
PA, 2012, COMPUT. EDUC.	1232	88.00
GR, 1992, ACAD. MED.	1175	34.56



Table 1.3  
Research Keywords

Keyword	Occurrences	Cluster
1. Human	1601	1
2. Homans	1371	
3. Procedures	409	
4. Clinical Competence	378	
5. Nursing Education	339	
1. Curriculum	1935	2
2. Education	1325	
3. Teaching	830	
4. Curricula	573	
5. Learning	515	
1. Medical Education	851	3
2. Female	559	
3. Male	525	
4. Adult	416	
5. Medical Student	388	
1. Article	1008	4
2. Human Experiment	248	
3. Qualitative Research	145	
4. Simulation	104	
5. Skill	113	

In an analysis of research in the field of "curriculum integration education," 4 clusters could be identified from the provided keywords. Cluster 1 is associated with "Human," "Homans," "Procedures," "Clinical Competence," and "Nursing Education." Cluster 2 highlights "Curriculum," "Education," "Teaching," "Curricula," and "Learning." Cluster 3 emphasizes "Medical Education," "Female," "Male," "Adult," and "Medical Student." Cluster 4 pertains to "Article," "Human Experiment," "Qualitative Research," "Simulation," and "Skill." This explanation is based on the occurrence patterns of keywords within each cluster and attempts to provide a general interpretation of the theme represented by each cluster.

### Discussion

This bibliometric study has been assessed by the researcher as successfully mapping the global research landscape in the field of "curriculum integration education" for over seven decades. The interpretation of the key findings not only answers

the research questions but also reveals the broader dynamics shaping this scholarly field. The annual publication growth of 13.99% and the peak productivity in 2025 are strong indicators that curriculum integration has evolved from a mere pedagogical discourse into a global imperative. This surge can be attributed to 21st-century external pressures, including labour market demands for graduates with complex skills and global advocacy from frameworks such as the Sustainable Development Goals (SDGs), which intrinsically require interdisciplinary and holistic curriculum approaches (Alimehmeti, Fia, and Paletta 2024).

The dominance of the United States as the leading contributor, followed by the United Kingdom, Australia, and Canada, reflects a geopolitical knowledge map wherein countries with established research funding systems and traditions of educational innovation lead knowledge production. However, the emergence of Indonesia and Malaysia within the top ten global contributors indicates a significant shift. This phenomenon demonstrates that the discourse of curriculum

integration is being actively adopted and contextualized beyond traditional knowledge centers, opening opportunities for contributions of local and indigenous perspectives to a global discourse historically dominated by the West.

The intellectual structure of this field, as revealed by the keyword network analysis, is supported by four main, interconnected pillars. The first cluster, centered on the themes "Human" and "Clinical Competence," affirms that health professions education, particularly medicine and nursing, has functioned as the most fertile living laboratory for developing and applying integration models. The second cluster, containing foundational keywords such as "Curriculum" and "Teaching," represents the theoretical and policy domain that underpins all integration practices. The third cluster, focusing on "Medical Education" and demographic aspects, highlights the importance of the learner's context in the integration process. Meanwhile, the fourth cluster, featuring "Qualitative Research" and "Simulation," reflects the methodological evolution in evaluating and innovating curriculum integration practices. The existence of these four clusters demonstrates a constant dialectic between theory and practice, continually refined through methodological innovation.

Further analysis through an overlay visualization reveals the evolution of research themes over time. Keywords such as "Sustainability" and "Higher Education," which have emerged in recent years, signify a shift in research focus towards contemporary issues and higher education contexts. Conversely, the density map identifies under-researched areas, such as "Pharmacy Student" and "Nursing Education Research," indicating potential knowledge gaps to be explored in the future. On the other hand, the finding of a low international collaboration rate (13.99%) reveals a paradox: although the topic is global in nature, research collaboration remains highly limited. This highlights an urgent need to build more inclusive and cross-border research networks to democratize knowledge production in this field.

Despite providing a comprehensive map, this study has several limitations. The sole reliance on the Scopus database may introduce bias and miss significant contributions indexed in other

repositories. Furthermore, the search strategy using specific key phrases may not capture the full spectrum of terminology in this broad field. Notwithstanding these limitations, the interpretation of these findings provides a solid foundation for the future development of this scholarly field.

## Conclusions

Overall, this bibliometric mapping study has successfully reconstructed the intellectual landscape and global development trends in the field of "Curriculum Integration Education" over more than seven decades. Based on an analysis of 6,935 Scopus-indexed documents, it can be concluded that this field has experienced remarkably significant growth with an annual rate of 13.99%, reaching its peak in 2025. This dynamic confirms that curriculum integration is no longer merely a pedagogical discourse but has evolved into a global response and strategic imperative to meet the demands of the 21st century for creating holistic, critical graduates capable of solving complex problems.

The main conclusions of this study, which also serve as the answers to the research questions, are as follows. First, in terms of productivity and contributors, the United States holds the position as the research epicenter, followed by the United Kingdom, China, and Australia. Meanwhile, the emergence of Indonesia among the top ten global contributors marks a geographical shift in knowledge and the potential contribution of local perspectives. At the institutional level, the University of Toronto and Harvard Medical School are recorded as the most productive affiliations, while Moore, T.J. and Guzey, S.S. are the most influential authors. Second, regarding the intellectual structure, a keyword network analysis reveals four main pillars that form this field: (1) integration within health professions education (medicine and nursing) centered on clinical competence; (2) foundations of curriculum theory and pedagogy; (3) a focus on learner context and demographics in medical education; and (4) methodological innovations in research and evaluation, including the use of simulation. Third, a

temporal trend analysis shows an evolution of research focus from foundational topics towards contemporary issues such as "Sustainability" and "Higher Education." However, the still low rate of international collaboration (13.99%) reveals a paradox where a topic of global nature is being studied within a collaboration network that remains limited.

Based on the key findings above, this study formulates several practical recommendations aimed at specific stakeholders.

First, for Researchers and Academics. It is recommended to conduct more in-depth exploration of areas that remain "low density" according to the density map, such as research on curriculum integration in the fields of pharmacy, specific nursing education, and vocational education contexts. Furthermore, it is crucial to actively build and strengthen international collaboration, not only with research centers in North America and Europe but also with researchers from countries with high productivity growth such as Indonesia and Malaysia. Such collaboration is expected to democratize knowledge production and enrich perspectives by incorporating local values and indigenous knowledge into the global discourse on curriculum integration.

Second, for Education Practitioners (Teachers, Lecturers, and Curriculum Developers). The research cluster findings that are particularly strong in medical education and STEAM can serve as an idea bank and empirical reference for adopting and adapting proven integration models. Practitioners are encouraged not only to focus on interdisciplinary content integration but also to consider demographic aspects and learner contexts, as revealed in the research clusters. The implementation of integration models should be accompanied by rigorous evaluation, considering the mixed-methods methodology that appears to be developing in research trends to comprehensively measure its impact.

Third, for Funding Agencies and Education Policy Makers (Ministries, Donor Institutions). These parties are advised to design funding programs and policies that specifically encourage collaborative research across institutions and

countries. Such policies should be designed to reduce the collaboration gap identified in this study. Additionally, policy-making institutions are recommended to use these findings as scientific evidence (evidence-based policy) in formulating more flexible and holistic national curriculum frameworks, as well as supporting professional development programs for teachers and lecturers focused on strengthening their capacity to design and implement integrated learning.

Ultimately, this study not only provides a clear roadmap for the future academic development of "Curriculum Integration Education" but also serves as a call for all stakeholders to engage more collaboratively, inclusively, and contextually in realizing the very essence of curriculum integration itself.

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