

Bibliometric computational mapping analysis of *Sekolah Indonesia Luar Negeri (SILN)* and learning difficulties using VOSviewer

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ABSTRAK

Penelitian ini mengkaji perkembangan penelitian mengenai sekolah Indonesia luar negeri (SILN) dan kesulitan belajar melalui pendekatan bibliometrik dengan analisis pemetaan komputasional menggunakan VOSviewer. Penelitian ini bertujuan untuk dapat mengetahui pengembangan penelitian dan juga menjadi penelitian dasar. Data artikel dari database Google Scholar diambil menggunakan aplikasi publish or perish reference manager. Artikel dicari berdasarkan Judul dan abstrak sebagai proses pencarian dengan mengacu pada kata kunci "Sekolah Indonesia Luar Negeri" dan "Kesulitan Belajar" menggunakan VOSviewer. Masa studi yang digunakan sebagai bahan kajian adalah artikel terindeks Google Scholar selama 10 tahun terakhir (2013 s/d 2023). Hasil penelitian menunjukkan bahwa penelitian memiliki 7 cluster. Sebanyak 983 artikel relevan diterbitkan pada rentang tahun 2013 hingga 2023. Hasil penelitian menunjukkan bahwa peluang untuk penelitian pada sekolah Indonesia luar negeri dan kesulitan belajar masih sangat tinggi karena belum ada penelitian langsung yang meneliti dan kemungkinan dikaitkan dengan istilah lain.

ABSTRACT

The development of research at *Sekolah Indonesia Luar Negeri (SILN)* and learning challenges are investigated in this study using a bibliometric approach and VOSviewer for computational mapping analysis. The purpose of this study is to learn more about research advancements as well as fundamental research. The article data were downloaded with the publish or perish reference manager application from the Google Scholar database. By VOSviewer to look up the keywords "Learning Difficulties" and "Sekolah Indonesia Luar Negeri," the search process is guided by the article's title and abstract. Articles from the last ten years (2013 to 2023) that Google Scholar has indexed are the study period used as study material. The study's findings indicate the seven clusters. A total of 983 pertinent articles published between 2013 and 2023 were found through the search results. The study's findings suggest a great chance to research learning difficulties in Indonesian schools abroad because the topic has not been directly studied and may be related to others.

INTRODUCTION

Among the regulations to regulate the implementation of *Sekolah Indonesia Luar Negeri* (henceforth, Overseas Indonesian Schools) are by the Minister of Foreign Affairs and the Minister of Education and Culture ([Kemendikbud](#)) Number 191/81/01 and Number 051/U/1981 in 2015. These regulate the status of teacher employment, teacher assignment processes, awards and teacher competency development, school funding, provision and maintenance of school facilities and infrastructure, non-formal education, procedures for feelings, requirements for educators and students, guidance and supervision of educators and students, and facility support by Indonesian schools for the learning process in various Indonesian communities ([Kemendikbud, 2015](#)).

Currently, fourteen overseas Indonesian schools are in ten countries: Bangkok (Thailand); Davao (Manila); The Hague (Netherlands); Jeddah, Mecca, and Riyadh (Saudi Arabia); Johor Bahru, Kota Kinabalu, and Kuala Lumpur (Malaysia); Cairo (Egypt); Moscow (Russia); Singapore (Singapore); Tokyo (Japan); and Yangon (Myanmar). In addition, the Ministry of Education and Culture has also developed distance/online learning through the Distance Education program by taking advantage of developments in information technology and media. The concept of Distance Education is through virtual classes on the Learning House portal, which can be used by educators or students starting from Early Childhood Education (PAUD), Elementary School (SD), to High/Vocational High School (SMA/SMK) ([Kumparan, 2019](#)).

This opens up opportunities regarding the learning process that can be chosen by overseas Indonesian students, whether to have a formal school or to take part in a distance education program. Therefore, an in-depth study is crucial regarding the learning process that can be chosen by Indonesian students abroad. In addition, it is necessary to consider the learning difficulties that will arise.

Bibliometric analysis is an analytical technique that can be used to assess developments in research trends ([Al Husaeni & Nandiyanto, 2022](#)). Bibliometric research is applied to several fields, such as education ([Marín et al, 2019](#); [Hallinger & Chatpinyakoo, 2019](#); [Segura et al, 2020](#); [Ragahita & Nandiyanto, 2022](#); [Wirzal, & Putra, 2022](#); [Riandi, Permanasari, & Novia, 2022](#)). Specifically, it is in the education field that leads to an analysis of bold learning trends that use technology ([Djeki et al, 2022](#); [Zhang, et al, 2022](#); [Rojas et al, 2023](#)). Apart from being in the world of education, bibliometric analysis can be used in other fields, such as social media ([Zyoud et al, 2018](#)) and psychological well-being ([Hendriks et al, 2019](#)). However, research on the completion of bibliometric processing has yet to be found with the theme of Overseas Indonesian Schools, as well as completing specific learning in the context of learning difficulties for students who study abroad with the learning process from their country of origin. So, the researchers focused on research for the last ten years (2013-2023). The researchers used the VOSviewer program to perform bibliometric analysis of articles indexed by Google Scholar through hacking research. The researcher's goal is to provide fundamental research so that other researchers can choose a study topic relevant to learning disabilities and *Sekolah Indonesia Luar Negeri* (SILN).

METHOD

For the data selection of *Sekolah Indonesia Luar Negeri* (SILN) and Learning Difficulties, this study uses publications in Google Scholar-indexed journals with the Publish or Perish application. Google Scholar was selected for its free search engine that enables users to look up scientific literature from varied sources. Since the topic of this article is still uncommon, additional search service databases like Scopus, WOS, DOAJ, and ERIC need a subscription to find more articles. For the data selection of *Sekolah Indonesia Luar Negeri* (SILN) and Learning Difficulties, this study uses publications in Google Scholar-indexed journals with the Publish or Perish application. Google Scholar was selected because it is a free search engine that enables users to look up scientific literature from varied sources. Since the topic of this article is still uncommon, additional search service databases like Scopus, WOS, DOAJ, and ERIC need a subscription to find more articles.

Detailed information for searching for articles and using the VOSviewer is in the literature ([Al Husaeni & Nandiyanto, 2022](#); [Pertz et al, 2018](#)). [Figure 1](#) illustrates the various steps by researchers to conduct a library search and a Google Scholar data search.

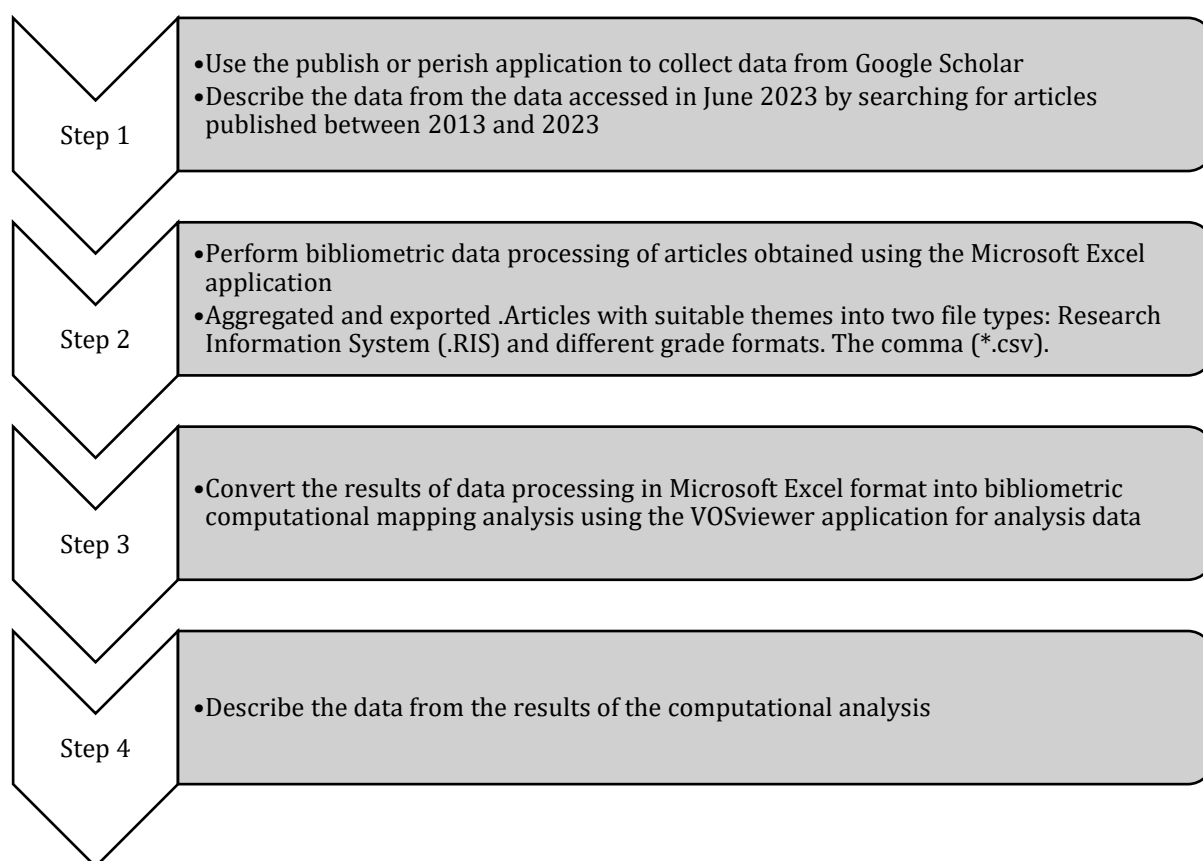


Figure 1. Method stages

A bibliometric map and a fractional calculation method—a fractionated link weight—VOSviewer was also utilized for trend visualization and assessment (Pertz et al, 2020). By building a source map in the primary analytic data set that illustrates the relationship between publication sources based on how frequently they are cited, the network structure of scientific journals in the field of mind and brain technology is investigated. The method of fractionated recalculation was three references to documents or journals plus one citation to sources or journals as the minimum requirements. It was determined how strong the citation connections were overall with other journals (Hamidah et al, 2020).

Using bibliographical data for analysis, maps based on network visualization of titles and keywords in *Sekolah Indonesia Luar Negeri (SILN)* and Learning Difficulties were constructed using critical analytical data. Afterward, the researchers mapped out the articles from the database. Three types of mapping publications from the mapping results are (1) network visualization, (2) density visualization, and (3) network-based overlay visualization (co-citation) between already-existing items. The frequency of the keyword is configured to appear at least five times. To create bibliometric maps, the theme eliminated 107 terms and keywords that needed to be more pertinent.

RESULT

Searching Results for Publication Data

Search results for "published or perish" in the Google Scholar database yielded 983 articles that fit the requirements for research topics on learning difficulties and *Sekolah Indonesia Luar Negeri (SILN)*. The articles with the most citations over the previous ten years, from 2013 to 2023, are displayed in Table 1. A description of the author, title, year, journal, publisher, citation count, linked articles, and associated URLs is also included. The researcher selected ten papers from the highest authorities accumulated each year as the sample. There are 24715 total sources from all the pieces used in this study and 2471,5 citations on average annually.

Table 1. Publication of Learning Difficulties and Sekolah Indonesia Luar Negeri (SILN)

No	Author(s)	Title	Years	Citation
1	Purwanto, et al, (2020)	Studi eksploratif dampak pandemi COVID-19 terhadap proses pembelajaran online di sekolah dasar.	2020	1718
2	Pakpahan & Fitriani (2020)	Analisa pemanfaatan teknologi informasi dalam pembelajaran jarak jauh di tengah pandemi virus corona covid-19.	2020	843
3	Mustofa, et al (2019)	Formulasi model perkuliahan daring sebagai upaya menekan disparitas kualitas perguruan tinggi.	2019	745
4	Gunawan, (2020)	Variations of models and learning platforms for prospective teachers during the COVID-19 pandemic period.	2020	545
5	Mungkasa, (2020)	Bekerja dari rumah (working from home/WFH): menuju tatanan Baru era pandemi Covid 19.	2020	475
6	Abidin, et al (2020)	Efektivitas pembelajaran jarak jauh pada masa pandemi covid-19	2020	471
7	Hutagaol, (2013)	Pembelajaran kontekstual untuk meningkatkan kemampuan representasi matematis siswa sekolah menengah pertama	2013	334
8	Iftitah, & Anawaty (2020)	Peran orang tua dalam mendampingi anak di rumah selama pandemi Covid-19	2020	330
9	Marinda, (2020)	Teori perkembangan kognitif Jean Piaget dan problematikanya pada anak usia sekolah dasar.	2020	279
10	Setiawan, (2019)	Efektivitas pembelajaran biologi berorientasi literasi saintifik.	2019	227

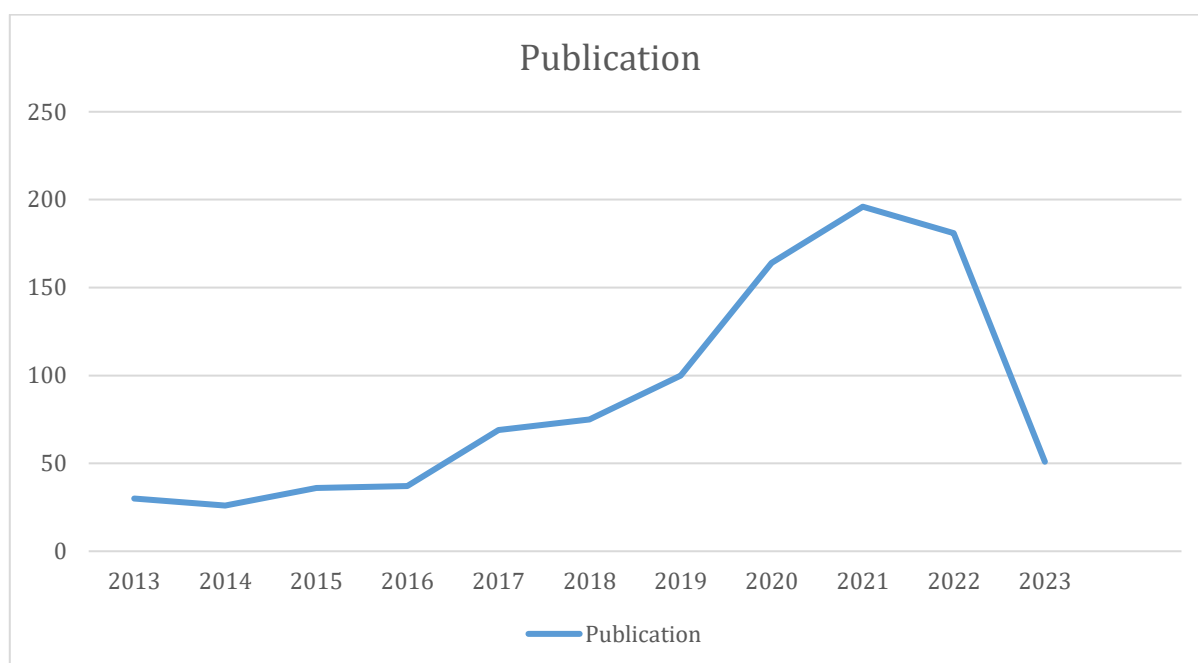
Development of Research in the Field of Overseas Indonesian School (SILN) and Learning Difficulties

Table 2 displays the evolution of research on learning difficulties and Overseas Indonesian Schools (SILN) in journals that Google Scholar has indexed. There are 983 articles from 2013 to 2023 in the research results on learning difficulties and Overseas Indonesian Schools (SILN). There were 30 articles published in 2013, 25 articles in 2014, 36 articles in 2015, 37 articles in 2016, 69 articles in 2017, 75 articles in 2018, 100 articles in 2019, 164 articles in 2020, 196 articles in 2021, 181 articles in 2022, and 69 articles in 2023. These findings suggest a dearth of research on learning difficulties and Overseas Indonesian Schools (SILN). But, over the past ten years, it has tended to decline. Figure 2 illustrates how the erratic research findings in recent years have risen from the year before. After 2019, though, the trend seems to be rising.

In Figure 2, research on overseas Indonesian schools and learning difficulties increased rapidly with the research above in 2019, which occurred in 2013, and 2018 research still tends to be a little on average of 30 articles per year. 2022 will be the pinnacle of research development. In 2023, the research has exceeded the initial average of articles in 2013, where there are currently 68 articles, and it is still possible to grow until the end of 2023.

Table 2. Advancement of the Field's Research of Learning Difficulties and *Sekolah Indonesia Luar Negeri (SILN)*

Year	Publication
2013	30
2014	26
2015	36
2016	37
2017	69
2018	75
2019	100
2020	164
2021	196
2022	181
2023	69
Total	983

**Figure 2. The evolution of research on learning difficulties and SILN over the past ten years, from 2013 to 2023.**

Visualization of *Sekolah Indonesia Luar Negeri (SILN)* and Learning Difficulties Topic Areas Using VOSviewer

Computational mapping uses the VOSviewer application to analyze data from previously obtained articles. From the computational mapping results, 107 items were found, which were mapped into 7 clusters, namely:

1. Cluster 1, *abk, di smp negeri, islam, kesulitan dalam, kesulitan dalam mengikuti, maka, masa pandemi covid, mengalami kesulitan belajar, menuli, merupakan Pendidikan, negeri, [ada, Palembang, pekanbaru, Pendidikan, penelitian ini, peserta, sekolah dasar negeri, sekolah luar biasa, sln, smp negeri.*
2. Cluster 2, *anak, analysis, berdasarkan, dalam, dalam belajar, dalam proses, dengan, di sekolah, difficulty, hal ini, hubungan, kesulitan belajar, kesulitan belajar matematika, kesulitan belajar siswa, kesulitan belajar yang dialami, proses, sd negeri, sma negeri, untuk*

3. Cluster 3, *bagi, Bahasa Indonesia, dari, di Indonesia, guru, ini, karena, menjadi, model, namun, negara, pembelajaran, Pendidikan Indonesia, pengembangan, penggunaan, secara, sehingga, sekolah dasar, sulit.*
4. Cluster 4, *baik, beberapa, belajar, dan, kegiatan, masa pandemi, mengalami, minat, pengaruh, sekolah, selain, siswa, smk negeri, terhadap, tua, untuk belajar, yang*
5. Cluster 5, *covid, education, learning, pandemic, penelitian, research, role, salah, semarang, student, study.*
6. Cluster 6, *dalam pembelajaran, dialami, factor, factor factor, jika, kela, kesulitan, luar negeri, sdn, studi, studi kasus.*
7. Cluster 7, *hal, juga, rendah, seperti, yang mengalami kesulitan belajar*

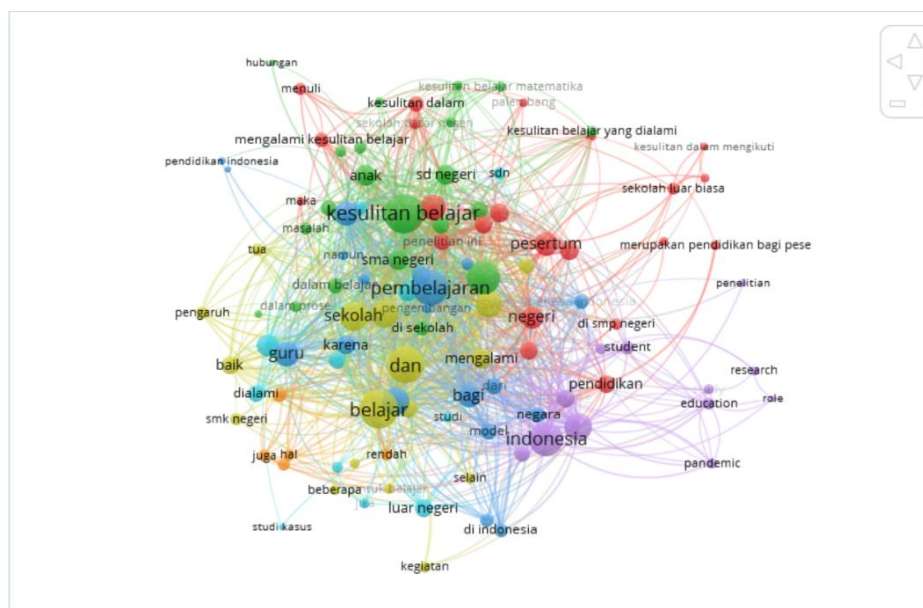
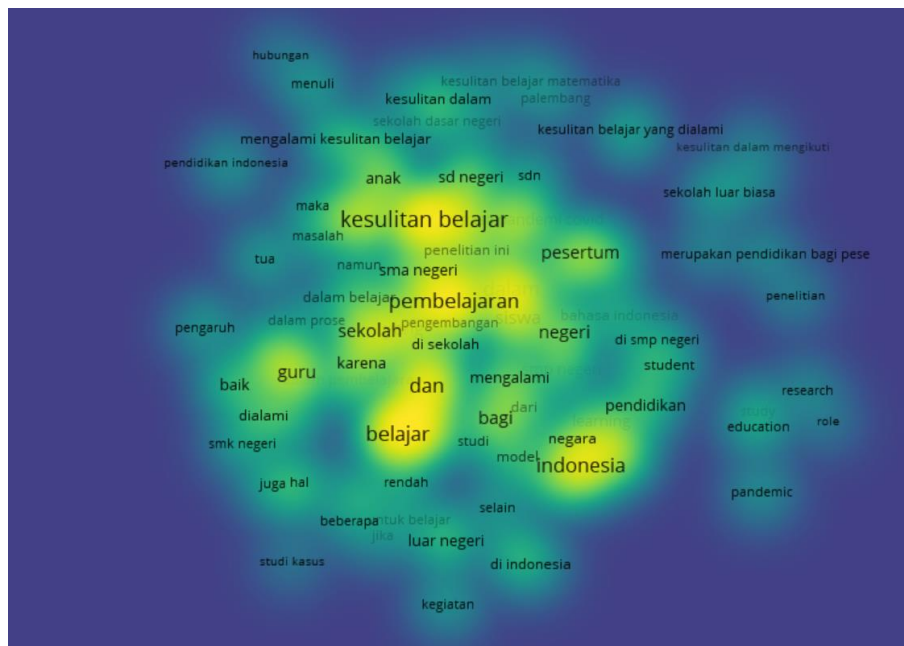




Figure 7. Learner network visualization

Figure 8. Learning difficulty overlay visualization

DISCUSSION

Visualization

A visualization of the extracted term density is in [Figure 3](#). According to [Pertz et al \(2020\)](#), the term density is quantified in terms of occurrence and co-occurrence in terms of size and color. Studying the relationship between learning challenges and Indonesian schools overseas: bibliometric analysis and scientific landscape visualization. The more the term appears frequently, the brighter the yellow color and the larger the circle diameter of the term label ([Waltman & Van Eck, 2012](#)). The intensity of the problem color is closest to red; the more tribal

incidents there were during that period and the more relationships there were with nearby tribes (Nandiyanto et al, 2021). Stated differently, Figure 6 lists the domain areas of learning challenges and overseas Indonesian schools that have been thoroughly studied, with a research emphasis on learning and learning difficulties.

Network visualization

A term map produced by describing clusters of closely related terms in a network visualization is in Figure 4. Certain periods occur more frequently in larger circles (Nandiyanto & Al Husaeni, 2021) and the closer two words/circles are to one another (Pertz et al, 2020). There may be a positive correlation between the label circle's size and the terms in the abstract and title; the label size will increase with the number of times the duration is found. Word clusters with similar meanings are indicated by color (Pertz et al, 2020). As a result, Figure 4's network visualization illustrates research on learning challenges and overseas Indonesian schools that examine the relationships between terms in a connected network. Two areas of clusters in network visualization can be used to analyze learning difficulties and overseas Indonesian schools. This learning difficulty in the first term is associated with cluster 2 and has a total linkage strength of 361 with 84 links and 144 occurrences (refer to Figure 6). As shown in Figure 7, the second term is a learner that is part of cluster 3 and has a total link strength of 315 links and 113 events.

Overlay visualization

An overlay visualization of learning challenges and research on Indonesian schools abroad is in Figure 8. Color variations signify advancements in research throughout time (Pertz et al, 2020). The novelty of research on related terms is illustrated by this visualization overlay (Hamidah, Sriyono, & Hudha, 2020). Figure 8 demonstrates that from 2019 to 2021, the learning difficulties tribe was the primary focus of the overlay visualization. This visualization indicates that studies on learning disabilities have been around for a long time, but the figure suggests no relationship to educational institutions overseas. This implies that not much has changed between 2019 and 2021 and the few studies in this field.

Contributions of research

Theoretically, this study can be a starting point for further research for the few overseas Indonesian universities. Learning disabilities could be a very interesting research topic. With a practical understanding of handling problems in overseas Indonesian schools, especially about learning difficulties, future research can refer to this research.

CONCLUSION

This study aims to carry out a computational mapping analysis of bibliometric data on research articles on learning difficulties and Overseas Indonesian Schools (SILN). The Google Scholar database was used to retrieve data via publication or expiration. Using titles and abstracts as their main keywords and the theme of Overseas Indonesian School (SILN) and Learning Difficulties, the researchers narrowed the search results to gather data. A total of 983 pertinent articles published between 2013 and 2023 were found through the search results. The results show that research on key Sekolah Indonesia Luar Negeri (SILN) and Learning Difficulties decreased from 2019-2022. The results show that the opportunities for research on Sekolah Indonesia Luar Negeri (SILN) and Learning Difficulties are still very high. One of the study's limitations is that additional search database sources, like the Scopus, WOS, DOAJ, and ERIC databases, have not been added to Google Scholar to improve the likelihood of collecting more articles. Other databases should be searched as part of the research recommendations. In addition, future researchers can look into Sekolah Indonesia Luar Negeri (SILN) using factors other than learning disabilities.

Author contributions

The first and second authors of the research designed and finalized the manuscript. The current author is responsible for data analysis, interpretation, and discussion of results.

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Conflict of interest

The authors declare that there is no potential conflict of interest.

Data availability statement

All data are available from the authors.

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