ASEAN Journal of Community and Special Needs Education

Journal homepage: https://ejournal.bumipublikasinusantara.id/index.php/ajcsne

Bibliometric Analysis for Understanding the Correlation Between Chemistry and Special Needs Education Using VOSviewer Indexed by Google

*Muhammad Roil Bilad**

Universiti Brunei Darussalam, Brunei Darussalam
*Correspondence: E-mail: roil.bilad@ubd.edu.bn

ABSTRACTS

The "core science" is another name for chemistry. Special education is a type of instruction tailored to the needs of children who are eligible for such services. The goal of this study is to combine mapping analysis with the use of a VOSviewer. The application Publish or Perish is used to locate articles that are relevant to the search phrase. The keyword in this research is "chemistry" and "special education." Between 2017 and 2021, 1000 items were relevant. The number of "chemistry" and "special education" publications decreased in 2017, 2018, 2019, and 2020, according to the search results. In 2021, however, it fell once more. The findings of this study are likely to aid scholars in conducting research and selecting research topics.

ARTICLE INFO

Article History:
Submitted/Received 19 Jan 2021
First revised 25 Feb 2022
Accepted 02 Mar 2022
First available online 10 Mar 2022
Publication date 01 Mar 2022

Keyword:
Bibliometric,
Chemistry,
Special needs education.

1. INTRODUCTION

Chemistry is also known as the "central science". Because chemistry connects physics with Banyak peneliti masa lalu telah menggunakan VOSviewer untuk melakukan penelitian bibliometrik, termasuk:other natural sciences like geology and biology, it is known as the "central science" (Ali & Khan, 2017). The science of matter and its properties is referred to as chemistry. Organic, inorganic, physical, analytical, and biochemical are the five primary categories of chemistry (Ünak, 2016). Examples of chemistry in everyday life are discoloration of leaves, food digestion, common salt, ice floating on water, tears while chopping onions, sunscreen, medicines, hygiene.

Special education is a type of instruction that is specifically tailored to meet the requirements of kids who are eligible for special education services (Riccomini *et al*., 2017). Special education is provided to parents at no cost and includes the related services that students require to participate in their educational program (Smith, 2005).

Many researchers have conducted research using VOSviewer to conduct bibliometric research, including: Digital learning (Al Husaeni & Nandiyanto, 2022), computer science (Al Husaeni & Nandiyanto, 2023a), vocational school (Al Husaeni & Nandiyanto, 2023b), high school (Al Husaeni & Nandiyanto, 2023c), covid-19 research (Hamidah, 2020), scientific publications (Mulyawati & Ramadhan, 2021), chemical engineering (Nandiyanto *et al*., 2021), materials research (Nandiyanto & Al Husaeni, 2021), special needs education (Al Husaeni *et al*., 2023a), publication of techno-economic education (Ragadhita & Nandiyanto, 2022), engine performance (Setiyo *et al*., 2021), dataset portrays decreasing number of scientific publications (Nandiyanto *et al*., 2020a), application in robotic hand systems (Castiblanco *et al*., 2021), research effectiveness in a subject area among top class universities (Nandiyanto *et al*., 2020b), educational research (Al Husaeni *et al*., 2023b), management bioenergy (Soegoto *et al*., 2022), magnetite nanoparticle (Nugraha, 2022), nanocrystalline cellulose production research (Fauziah, 2022), nano metal-organic frameworks synthesis (Shidiq, 2023), titanium dioxide nanoparticle synthesis (Nugraha & Nandiyanto, 2022), nanocrystalline cellulose (Maulidah & Nandiyanto, 2022), carbon nanotubes (Aldhafi & Nandiyanto, 2021), nano-sized agricultural waste brake pads (Deni & Nandiyanto, 2022).

The goal of this study is to combine mapping results using the VOSviewer tool to undertake a special education bibliometric chemistry study. This study is expected to aid and serve as a reference for researchers in conducting and determining topics for future research, particularly in the field of “chemistry” and “special education” keywords.

2. METHODS

The article data used for this study is based on research from publications that have been visited in Google Scholar-indexed journals. The utilization of Google Scholar is because it is a free resource. You can utilize the Scopus database in addition to Google Scientist, but Scopus is charged since it is a little difficult to access. In our next investigation, however, we will use the Scopus database. In data management, the Publish or Perish program is employed.

According to the title, keywords, and abstract requirements, the keyword "Special education” and “Chemistry” used to search for data is published or erased. As a result, 1000 articles were obtained and evaluated based on the chosen topic. The publications chosen were published between 2017 and 2021. After that, the articles are stored in *.ris format. In addition, the data is visualized and analyzed using a bibliometric map. Data from the prepared database source is then visualized in three ways: network visualization, overlay visualization, and density visualization.

DOI:
p- ISSN 2828-3236 e- ISSN 2828-3309

3. RESULTS AND DISCUSSION

3.1. Research Development in the Field of Chemical Engineering Special Needs

Figure 1 depicts the structure of the research frequency curve for the term "chemistry" and "special education." In 2017, 2018, and 2019, the number of students enrolled in "chemistry" and "special education" fell. Then, it rose again in 2020, before dropping again in 2021.

In 2017, 2018, and 2019 the number of article publications discussing the keywords used decreased. In 2017 the number of articles published was 204 articles, then it fell to 200 articles in 2018 and fell again to 199 articles in 2019. In 2020 the number of publications regarding used keywords increased by 69 articles to 268 articles. However, in the following year, it decreased significantly to 129 articles.

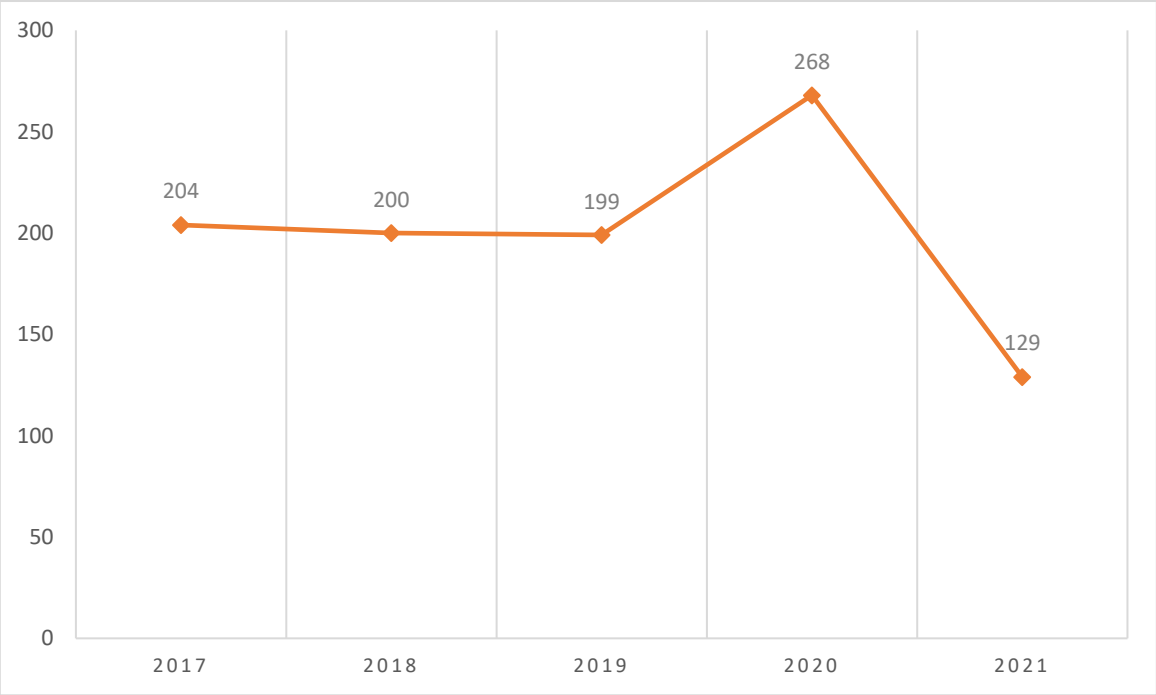

Figure 1. Developmental level of research on "chemistry" and "special education".

3.2. Clusters Resulting from The Vosviewer Mapping with The Keyword of Chemical Engineering Special Needs

The minimum number of relationships between terms in VOSviewer is set at least two. Based on the findings of mapping using VOSviewer with the keyword "chemistry" and "special education", there are five clusters. Each cluster has a unique color that indicates the cluster's type. Each cluster is a circle of varying sizes. The size of the circle is determined by the frequency. The larger the circle, the more frequently the word is used in research.

The following is an explanation of the five clusters:

(i) Cluster 1 has 34 items marked in red color.

(ii) Cluster 2 has 25 items that are marked in green color.

DOI:
p- ISSN 2828-3236 e- ISSN 2828-3309

(iii) Cluster 3 has 24 items marked in blue color.

(iv) Cluster 4 has 21 items marked in yellow color.

(v) Cluster 5 has 21 items marked in violet color.

3.3. Visualization Chemical Engineering Special Needs Topic Area Using VOSviewer

VOSviewer supports three types of visualizations: (i) Network visualization (**Figure 2**), (ii) Overlay visualization (**Figure 3**), (iii) Density visualization (**Figure 4**). **Figure 2** illustrates the clusters of each of the issue areas studied as a network representation. In this work, the term "chemical special reduction" is employed. The geometry of the overlay visualization is depicted in **Figure 3**. In overlay visualization, we can obtain which year the study of the terms that we are looking for is most prevalent. The keyword here is "chemistry special education." The density visualization method is shown in **Figure 4**. Using density visualization, we can visualize how frequently the phrase will be used in research. The color of a phrase can be used to determine how frequently it is used. The more frequently a phrase is used, thus, the darker color can be gained.

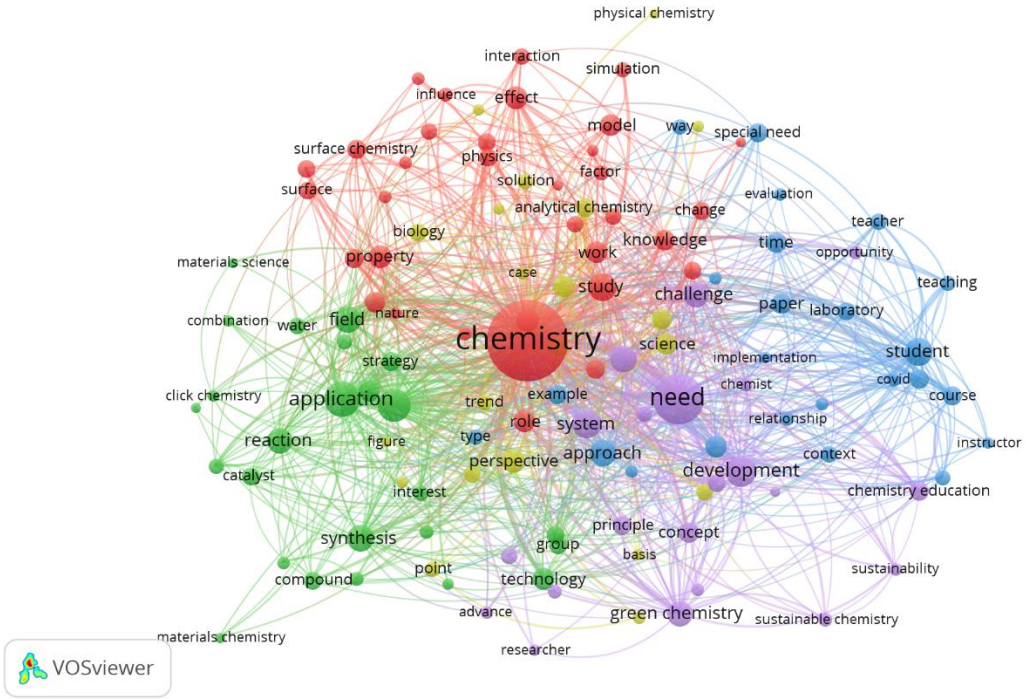

Figure 2. Network visualization of chemistry special education keyword.

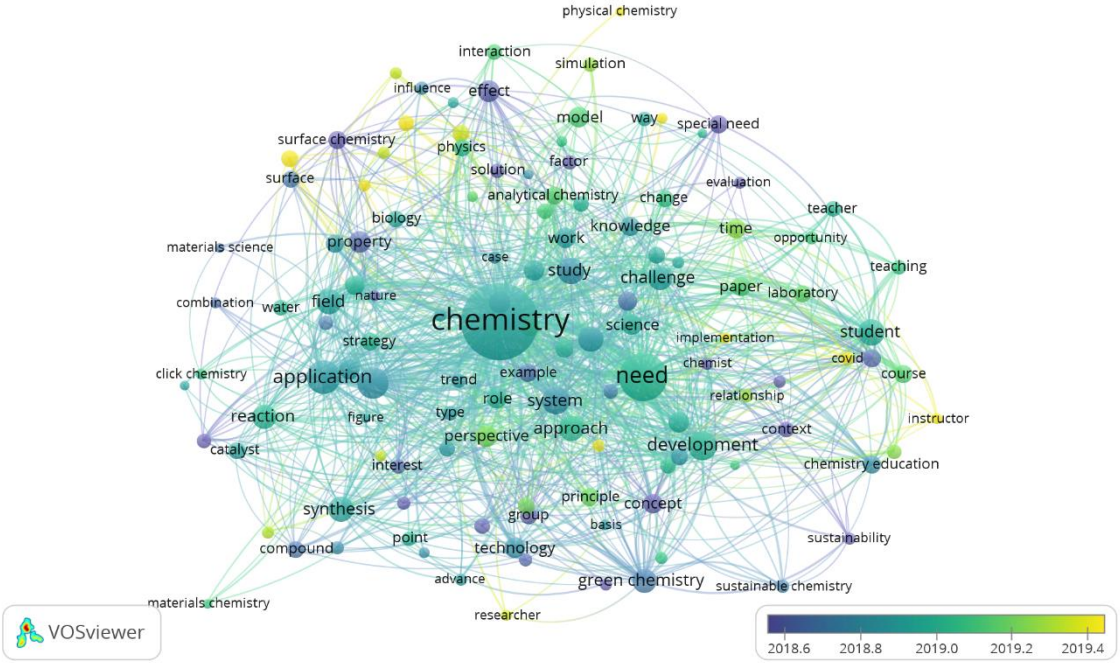

Figure 3. Overlay visualization of chemistry special education keyword.

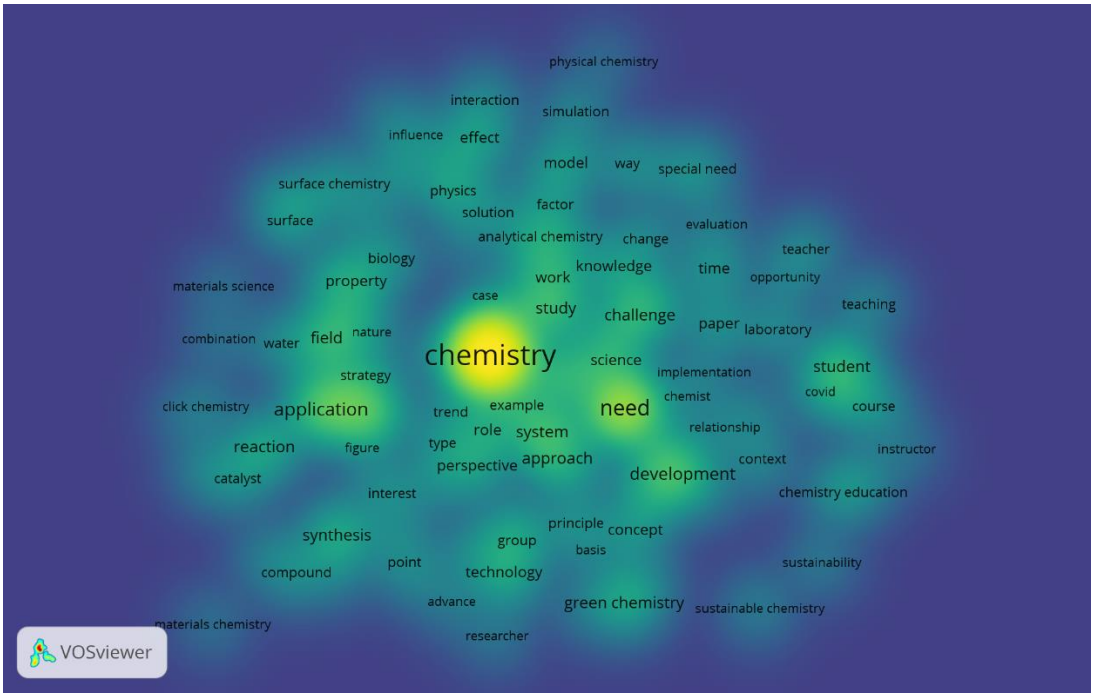

Figure 4. Density visualization of chemistry special education keyword.

4. CONCLUSION

The goal of this study is to merge high school mapping with VOSviewer software. The data for this study was gathered using the publish or perish reference manager application. The keyword "Chemistry" and "Special Education" is used to filter the information received. One of the bibliographic data used in this study was the topic, title, keyword, and abstract. We discovered 1000 articles from 2017 to 2021 that were relevant. According to the findings of

DOI:
p- ISSN 2828-3236 e- ISSN 2828-3309

this study, the number of articles produced between 2017-2021 about high school declined from 2017 to 2018, while the number of articles published on keywords utilized increased in 2019. However, it will begin to drop again in 2021. More than 1000 citations have been found in some of the publications obtained. When you search for the term "chemistry special education," we can find five clusters, each with a different number of items. Each cluster is identified by a different colored circle. The size of the circle denotes how frequently the term is used or not.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

6. REFERENCES

Al Husaeni, D. F., and Nandiyanto, A. B. D. (2022). Bibliometric using Vosviewer with Publish or Perish (using google scholar data): From step-by-step processing for users to the practical examples in the analysis of digital learning articles in pre and post Covid-19 pandemic. ASEAN Journal of Science and Engineering, 2(1), 19-46.

Al Husaeni, D. F., and Nandiyanto, A. B. D. (2023a). Mapping visualization analysis of computer science research data in 2017-2021 on the google scholar database with vosviewer. International Journal of Informatics Information System and Computer Engineering, 3(1), 1-18.

Al Husaeni, D. N., and Nandiyanto, A. B. D. (2023b). A bibliometric analysis of vocational school keywords using vosviewer. ASEAN Journal of Science and Engineering Education, 3(1), 1-10.

Al Husaeni, D. N., and Nandiyanto, A. B. D. (2023c). Bibliometric analysis of high school keyword using VOSviewer indexed by google scholar. Indonesian Journal of Educational Research and Technology, 3(1), 1-12.

Al Husaeni, D. N., Nandiyanto, A. B. D., and Maryanti, R. (2023a). Bibliometric Analysis of Special Needs Education Keyword Using VOSviewer Indexed by Google Scholar. Indonesian Journal of Community and Special Needs Education, 3(1), 1-10.

Al Husaeni, D.F., Nandiyanto, A.B.D., and Maryanti, R. (2023b). Bibliometric Analysis of Educational Research in 2017 to 2021 using VOSviewer: Google Scholar indexed Research. Indonesian Journal of Teaching in Science, 3(1), 1-8.

Aldhafi, A., and Nandiyanto, A.B.D. (2021). A Bibliometric Analysis of Carbon Nanotubes Synthesis Research Using Vosviewer. International Journal of Research and Applied Technology (INJURATECH), 1(2), 76-81.

Ali, H., and Khan, E. (2017). Environmental chemistry in the twenty-first century. Environmental Chemistry Letters, 15(2), 329-346.

Castiblanco, P. A., Ramirez, J. L., and Rubiano, A. (2021). Smart materials and their application in robotic hand systems: A state of the art. Indonesian Journal of Science and Technology, 6(2), 401-426.

Deni, S., and Nandiyanto, A. B. D. (2022). Bibliometric Analysis of Nano-Sized Agricultural Waste Brake Pads Research during 2018-2022 Using Vosviewer. International Journal of Sustainable Transportation Technology, 5(1), 12-18.

Fauziah, A. (2022). A Bibliometric Analysis of Nanocrystalline Cellulose Production Research as Drug Delivery System Using VOSviewer. Indonesian Journal of Multidiciplinary Research, 2(2), 333-338.

Hamidah, I., Sriyono, S., and Hudha, M. N. (2020). A Bibliometric analysis of Covid-19 research using VOSviewer. Indonesian Journal of Science and Technology, 5(2), 209-216.

Maulidah, G. S. and Nandiyanto, A. B.D. (2022). A Bibliometric Analysis of Nanocrystalline Cellulose Synthesis for Packaging Application Research Using VOSviewer. Open Global Scientific Journal, 1 (1), 1-7.

Mulyawati, I. B., and Ramadhan, D. F. (2021). Bibliometric and visualized analysis of scientific publications on geotechnics fields. ASEAN Journal of Science and Engineering Education, 1(1), 37-46.

Nandiyanto, A. B. D., Al Husaeni, D. N., and Al Husaeni, D. F. (2021). A bibliometric analysis of chemical engineering research using vosviewer and its correlation with covid-19 pandemic condition. Journal of Engineering Science and Technology, 16(6), 4414-4422.

Nandiyanto, A. B. D., and Al Husaeni, D. F. (2021). A bibliometric analysis of materials research in Indonesian journal using VOSviewer. Journal of Engineering Research, 9(ASSEEE Special Issue), 1-16.

Nandiyanto, A. B. D., Biddinika, M. K., and Triawan, F. (2020a). How bibliographic dataset portrays decreasing number of scientific publication from Indonesia. Indonesian Journal of Science and Technology, 5(1), 154-175.

Nandiyanto, A. B. D., Biddinika, M. K., and Triawan, F. A. R. I. D. (2020b). Evaluation on research effectiveness in a subject area among top class universities: a case of Indonesia's academic publication dataset on chemical and material sciences. Journal of Engineering Science and Technology, 15(3), 1747-1775.

Nugraha, E. R. and Nandiyanto, A. B.D. (2022). Bibliometric Analysis of Titanium Dioxide Nanoparticle Synthesis Research for Photocatalysis Using Vosviewer. Open Soil Science and Environment, 1(1), 8 – 14.

Nugraha, S. A. (2022). Bibliometric Analysis of Magnetite Nanoparticle Production Research During 2017-2021 Using Vosviewer. Indonesian Journal of Multidiciplinary Research, 2(2), 327-332.

Ragahita, R., and Nandiyanto, A. B. D. (2022). Computational Bibliometric Analysis on Publication of Techno-Economic Education. Indonesian Journal of Multidiciplinary Research, 2(1), 213-220.

Riccomini, P. J., Morano, S., and Hughes, C. A. (2017). Big ideas in special education: Specially designed instruction, high-leverage practices, explicit instruction, and intensive instruction. Teaching Exceptional Children, 50(1), 20-27.

DOI:
p- ISSN 2828-3236 e- ISSN 2828-3309

Setiyo, M., Yuvenda, D., and Samue, O. D. (2021). The Concise latest report on the advantages and disadvantages of pure biodiesel (B100) on engine performance: Literature review and bibliometric analysis. Indonesian Journal of Science and Technology, 6(3), 469-490.

Shidiq, A. P. (2023). A Bibliometric Analysis of Nano Metal-Organic Frameworks Synthesis Research in Medical Science Using VOSviewer. ASEAN Journal of Science and Engineering, 3(1), 31-38.

Smith, T. E. (2005). IDEA 2004: Another round in the reauthorization process. Remedial and Special Education, 26(6), 314-319.

Soegoto, H., Soegoto, E. S., and Luckyardi, S. (2022). A bibliometric analysis of management bioenergy research using vosviewer application. Indonesian Journal of Science and Technology, 7(1), 89-104.

Ünak, T. (2016). What is exactly the scope of nuclear chemistry and its educational position between other chemistry branches. Advances in Chemical Engineering and Science, 7(1), 60-75.

DOI:
p- ISSN 2828-3236 e- ISSN 2828-3309