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Correlation between Process Engineering and Special Needs from Bibliometric Analysis Perspectives

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ABSTRACTS

Process engineering is largely concerned with the manufacturing of finished goods from beginning to end. People with physical disabilities require specialized care or assistance, such as because of a handicap. The goal of this study is to integrate mapping analysis with the use of the VOSviewer program. The application Publish or Perish is used to locate articles that are relevant to the search phrase. The important phrase in this study is "process engineering specific needs." According to the search results, there were 961 relevant articles published between 2017 and 2021. Every year, the number of publications on "process engineering special demands" has declined and increased.

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1. INTRODUCTION

Process engineering is primarily concerned with the production of end-to-end products. Process engineering is a relatively recent subject that supports the long-term technological and economic development of enterprises around the world (Spanos *et al.*, 2022). Process engineers play a significant role in many industries, particularly in the manufacturing sector, by designing, controlling, and running the chemical or biochemical processes and equipment that are used to transform raw materials into valuable products (Bramsiepe *et al.*, 2012).

People with physical disabilities are those who require specialized care or assistance, such as because of a disability (Dolan, 2013). Disability is a condition that makes it difficult for a person to carry out daily tasks or interact with others (Devile & Kastenholz, 2018). Children with exceptional needs can be caused by two types of factors: internal and external. Internal influences are caused by children's persistent defects. External influences, on the other hand, are due to temporary incapacity (Maryanti *et al.*, 2021).

Previous researchers have done a lot of research on bibliometrics using VOSviewer, including: Digital learning (Al Husaeni & Nandiyanto, 2022), computer science (Al Husaeni & Nandiyanto, 2023a), vocational school (Al Husaeni & Nandiyanto, 2023b), high school (Al Husaeni & Nandiyanto, 2023b), covid-19 research (Hamidah *et al.*, 2020), scientific publications (Mulyawati & Ramadhan, 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, 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, 2021), 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 bibliometric study on special needs process engineering. This study is expected to aid and serve as a reference for researchers in researching and deciding on research subjects, particularly those pertaining to process engineering special needs.

2. METHODS

This study's data articles are based on research that was published in a Google Scholar-indexed journal. Because Google Scholar is a free resource. Other than Google Scholar, you could use Scopus databases, however, Scopus costs a price to access them. However, we will employ the Scopus database in our next investigation. In data management, publish or perish applications are used.

The keyword "process engineering special needs" is used to search data for papers that have been published, in accordance with the title, keywords, and abstract requirements. 961 articles matched the selected topic based on the search results. The article will be published between 2017 - 2021. The article is then saved in *.ris format. Bibliometric maps are used to show and analyze data. After that, the data from the prepared database source is visualized in three different ways: network visualization, overlay visualization, and density visualization.

3. RESULTS AND DISCUSSION

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

Figure 1 shows the shape of the development research curve with the keywords "process engineering special needs" shown in Figure 1. On the curve, it can be seen that the research "process engineering special needs" has an unstable development. in 2017 the number of publications regarding the keywords used was 217 articles, this increased in the following year to 231 articles. However, in 2019 it decreased again to 180 articles and increased again in 2020 to 190 articles. Finally, in 2021, it decreased again to 143 articles.

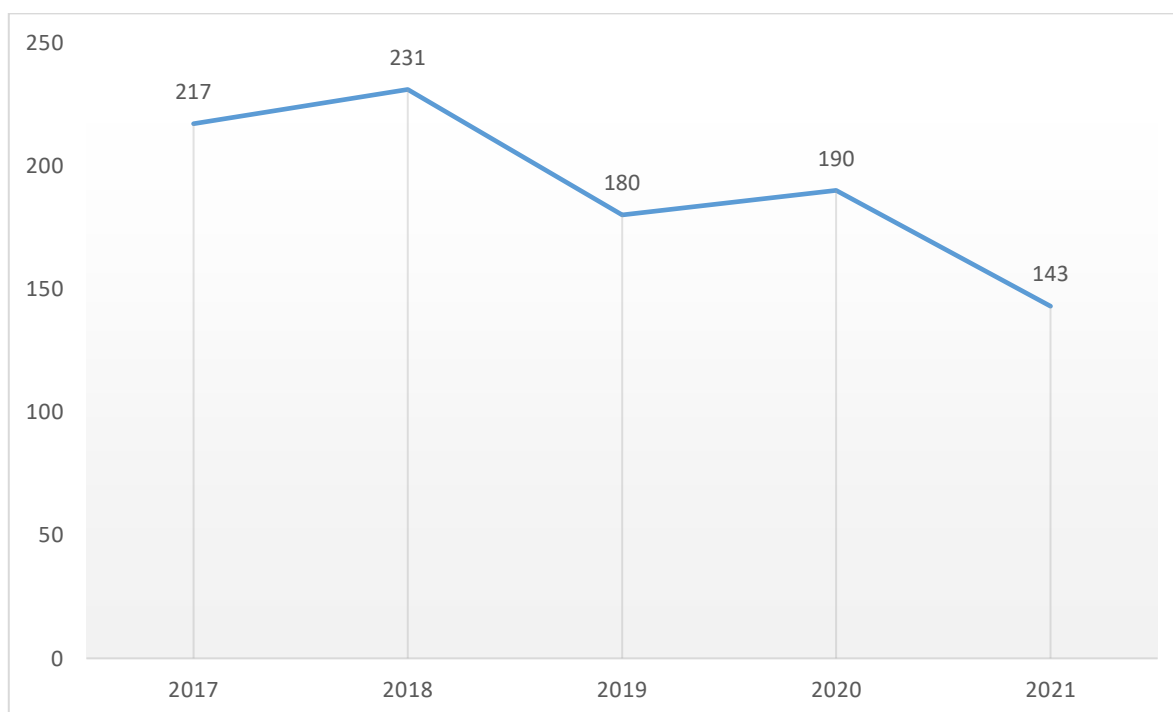


Figure 1. Developmental level of research on process engineering special needs.

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

In VOSviewer, the minimum number of relationships between terms is set to at least two. The number of clusters obtained based on the results of mapping using VOSviewer with the sentence "Special Needs for Chemical Engineering" is 9 clusters. Each cluster has a different color, the color indicates the type of each cluster. Each cluster is a different circle. The size of the circle is determined by the size of the frequency of use of the terms in the circle. The more often the term is used, the larger the circle will be. Vice versa, the less often the term is used, the smaller the circle size.

The following is an explanation of the 9 clusters.

- (i) Cluster 1 has 99 items marked in red.
- (ii) Cluster 2 has 75 items which are marked in green.
- (iii) Cluster 3 has 70 items marked in dark blue.
- (iv) Cluster 4 has 35 items marked in yellow.
- (v) Cluster 5 has 31 items marked in violet.
- (vi) Cluster 6 has 25 items marked in blue.
- (vii) Cluster 7 has 21 items marked in orange.

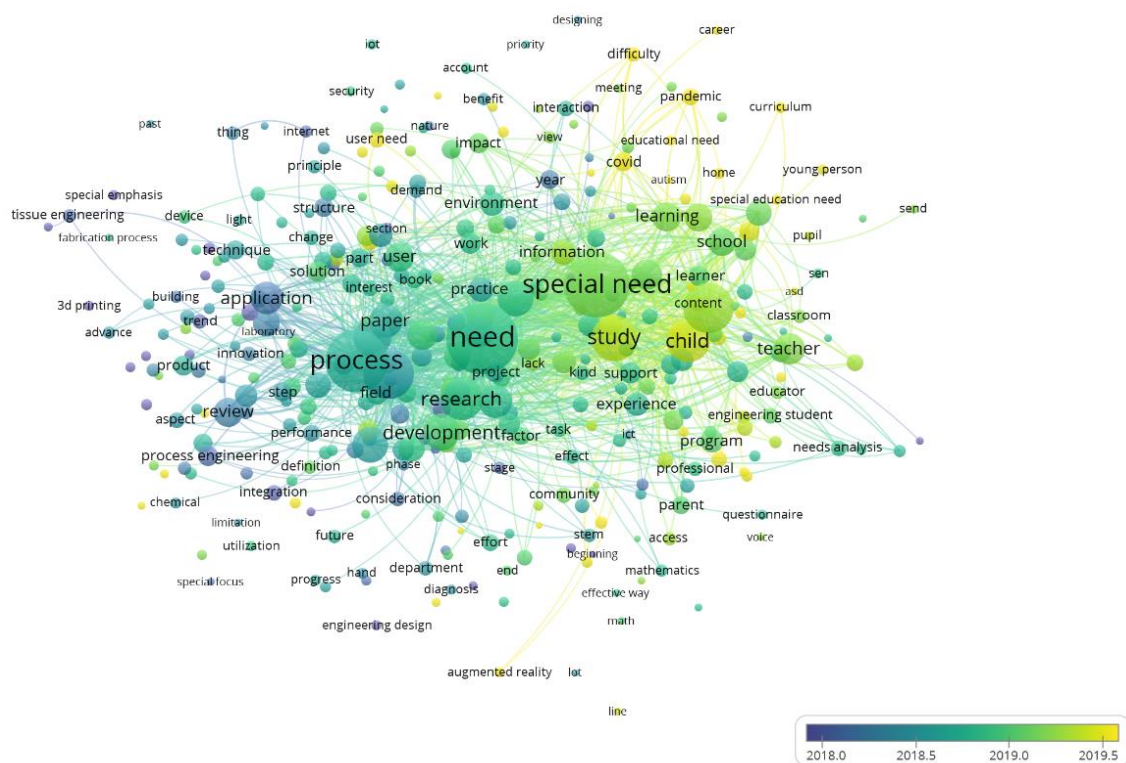


Figure 3. Overlay visualization of process engineering special needs keyword.

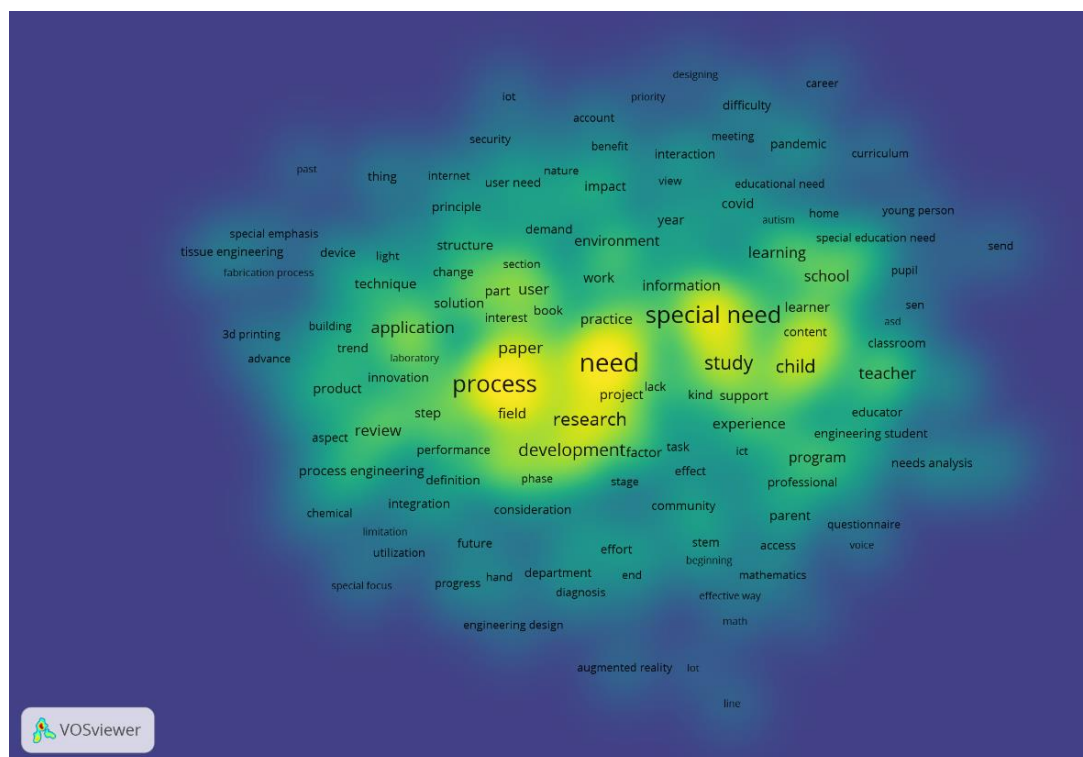


Figure 4. Density visualization of process engineering special needs keyword.

4. CONCLUSION

process engineering specific needs." The Publish or Perish reference application was used to collect data for this study. The information received is filtered using the phrase "special needs process engineering." Topics, titles, keywords, and abstracts were employed in all other bibliographical analyses in this study. Based on our search results, we found 961 relevant publications published between 2017 and 2021. According to the findings in this study, the number of articles on "process engineering special needs" decreased in 2017, 2019, and 2021. However, it also increased in 2018 and 2020. A search for the term "process engineering special needs" yields 9 different clusters. Each cluster is identified by circles of different sizes. Whether or not a term is used as a research theme is indicated by the size of each circle.

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.

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