Bibliometric Analysis of Special Needs Education Keyword Using VOSviewer Indexed by Google Scholar

Dwi Novia Al Husaeni, Asep Bayu Dani Nandiyanto*, Rina Maryanti

Universitas Pendidikan Indonesia, Bandung, Indonesia
* Correspondence: E-mail: nandiyanto@upi.edu

A B S T R A C T

Special needs education is a field of study that focuses on providing educational services to children with special needs who have learning and developmental challenges. The goal of this research is to combine mapping analysis with the VOSviewer app. The Publish or Perish application is used to find publications that are relevant to the keywords that have been entered. The term "Special Needs Education" was utilized in this study as a keyword. According to the search results, 400 relevant articles were published between 2017 and 2021. The number of publications published on "Special Needs Education" has declined every year, according to the research findings. This study should aid researchers in conducting and determining the research theme.

A R T I C L E   I N F O

1. INTRODUCTION

Special needs education is a scientific subject that examines educational services customized to all children who have learning and developmental challenges as a result of temporary or permanent special needs (Hasselbring & Glaser, 2000). At the primary and secondary levels, special education is the provision of education for students with disabilities or unusual intelligence that is held either inclusively (joining regular schools) or in the form of special education units.

At the primary and senior school levels, special education is provided. Children with exceptional needs are separated into two categories: Children with temporary (temporary) special needs and children with permanent special needs (Koster et al., 2010). External circumstances, whereas children with long-term special needs are produced by specific diseases (Koster et al., 2010).

In Indonesia, the special education system has experienced a paradigm shift from a medical perspective to a social perspective. Initially, special education looked at children in terms of limitations. Education designs how to heal and treat internal obstacles and problems. So that special education in Indonesia is known as Special Education (PLB). Along with the change in paradigm to a social perspective, educators view children in terms of their optimized potential. Therefore, the name of special education changed to special education. The paradigm shift in the view of special education has made changes to the special education system in Indonesia. The Indonesian government provides opportunities for all children to be able to get education in school, as well as for students with special needs (Maryanti *et al.*, 2021).

According to Maryanti *et al.* (2021) Children with permanent special needs include:

(i) Children with visual impairments (tunanetra). Children with visual impairments are children who have visual impairments so they need special educational services in their education and life. Children with visual impairment are divided into two categories, namely children with low vision (low vision) and blind children (blind).

(ii) Children with hearing impairments (tunarungu). Children with hearing impairments are children who lose part or all of their hearing power so they experience problems communicating verbally (Al-Rowaily et al., 2012).

(iii) Children with intellectual disabilities (tunagrahita). Children with intellectual disabilities are children who have below average intelligence, have problems in adaptive behavior, so they have difficulty completing tasks in everyday life.

(iv) Children with physical / mobility impairments (tunadaksa). Children with limb / physical impairments are children who have permanent disabilities or disabilities in the limbs or neurological disorders in the brain.

(v) Children with emotional and behavioral disorders (tunalaras). Children with emotional and behavioral disorders are children who show deviant behavior at moderate, severe or very severe levels that occur at the age of children and adolescents that occur due to disruption of emotional and social development.

(vi) Children with specific learning disorders. Children with specific learning disorders are children who have problems in the learning process caused by disorders in a basic psychological, central nervous system dysfunction, and / or neurological disorders.

(vii) Autistic. Autistic children are children who experience disturbances in interaction, communication and social behavior. They are known to be more immersed in their own world.

(viii) Attention deficit hyperactivity disorder (ADHD). Attention deficit hyperactivity disorder children are children who have trouble concentrating and have hyperactive behaviors.

Many reports on bibliometrics and special needs education have been carried out. These studies include research on bibliometrics (Al Husaeni & Nandiyanto, 2022; Al Husaeni & Nandiyanto, 2023; Al Husaeni & Nandiyanto, 2023; Al Husaeni & Nandiyanto, 2023; Hamidah et al., 2020; Mulyawati & Ramadhan, 2021; Nandiyanto et al., 2021; Nandiyanto & Al Husaeni, 2021), practicum effectiveness in special needs education (Buli-Holmberg & Jeyaparathaban, 2016), special needs education in europe (Meijer et al., 2004) and special needs education in vocational (Szymanski et al., 1990; Hirvonen, 2011; Hakala, 2010). No one has looked into bibliometrics in the context of special education in any of these papers.

By merging the results of mapping with VOSviewer software, this project aims to undertake bibliometric research on special needs schooling. This study is meant to aid and serve as a reference for researchers performing and deciding on research topics, particularly those relating to special education.

2. METHODS

The article data used in this study is based on research from publications that have been published in Google Scholar-indexed journals. The utilization of Google Scholar is due to the fact that it is a free resource. You can utilize the Scopus database in addition to Google Scholar, but, Scopus is charged since it is a bit difficult to access. In our next investigation, however, we will use the Scopus database. In data management, the Publish or Perish program is employed. The research conducted by Al Husaeni and Nandiyanto (2022) provides detailed information about VOSviewer and library search.

According to the title, keywords, and abstract requirements, the keyword "Special Needs Education" is used to search for published or published data. 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.

3. RESULTS AND DISCUSSION
3.1. Research Development in the Field of Special Needs Education

Figure 1 depicts the form of the research curve from 2017 to 2021 for the keyword "Special Needs Education." Over the previous five years, the growth of research using the term "Special Needs Education" has slowed. The form of the downward slope reflects this decline. There were 157 articles in 2017, and 98 articles in 2018, before declining to 68 articles in 2019, 59 articles in 2020, and 18 items in 2021. The average publication of articles relevant to the keyword "Special Needs Education" in the last five years, namely from 2017-2021 is 80 articles per year. The data can be seen in **Table 1.**
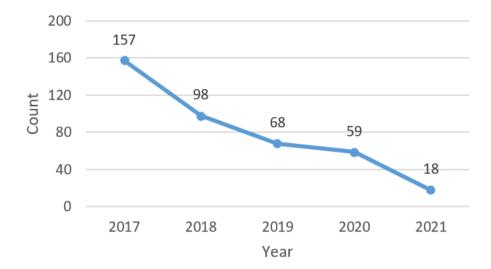
Figure 1. Developmental level of research on special needs education.

Table 1. Average publication of articles in 2017-2021.

Year	Count
2017	157
2018	98
2019	68
2020	59
2021	18
Total	400
Average	80

3.2. Clusters Resulting from the VOSviewer Mapping with the Keyword of Special Needs Education

In VOSviewer, the minimum number of relationships between terms is set to two (Al Husaeni & Nandiyanto, 2022; Al Husaeni & Nandiyanto, 2023). The number of clusters created based on the results of mapping using VOSviewer with the phrase "Special Needs Education" is 13. Each cluster has a distinct hue that denotes the cluster's kind. Each cluster is a different-sized circle. The frequency of the circle determines its size (Al Husaeni & Nandiyanto, 2023). The word is used more frequently as the circle size grows greater. The word is used less frequently as the circle size gets smaller.

The following are the thirteen clusters derived from the VOSviewer mapping with the keyword "Special Needs Education".

(i) Cluster 1 which is marked in red has 72 items, the 72 items are absence, addition, age, age group, ASD, assessment, assistance, association, blended learning, care, caregiver, child, day, des, difference, disaster, education, emergency, employment, enrolment, Europe, European social survey, evaluation, example, experience, further education, gap, gender, demography, group, health belief, health care, high education, higher education sector, highest level, home, importance, home, importance, interest, intervention, Ireland, item, level, life, number, opportunity, oral health status, order, parent, parental education, parental involvement, patient, perception, person, practitioner, quality, regard, region, risk, scale, social determinant, special care, special module, special needs student, special training, systematic review, thrust, training, transition, validity, young adult and youth.

(ii) Cluster 2 which is marked in dark green has 59 items, the 59 items are activity, actor, administrator, analysis. Attention, brazil, case study, category, cause, collaboration, condition, conference, coronavirus, country, covid, culture, design thinking, difficulty, effect, future direction, goal, headmasters leadership, heist, higher education institution, higher education system, highlight, an important element, issue, job, job satisfaction, Latin America, leadership, learning process, lifelong learning, literature, Malaysia, meta-analysis. Notion, pandemic, practice, promotion, review, role, Salamanca statement, society, special condition, special education, special education leadership, special education teacher, special need student, sustainability, sustainability initiative, sustainability development, task, task load, understanding, variety, world, and young generation.

(iii) Cluster 3 which is marked in dark blue has 59 items, the 59 items are 21st century, 21st century education, ability, adult education, career, childhood education, communication, complexity, concept, content, continuous professional development, curriculum, disabled student, distance education, domain, e-learning, early childhood, early childhood education, etc, education today, elementary school, engagement, extent, forefront, framework, ICT, inclusive pedagogy, Indonesia, learner, learning, line, literacy, mainstream education, mathematics, mathematics education, mobile learning, motivation, nature, necessity, Norwich, opinion, power, primary education, problem, realistic mathematics education, robotic, science education, serious game, social medium, special focus, start, stem education, strength, teacher education program, theme, total, and use.

(iv) Cluster 4 which is marked in yellow has 48 items, the 58 items are academic achievement, active learning, advocate, application, basis, business, change, contextual factor, current education, discipline, driver, early year, education sector, emphasis, engineering, engineering education, equity, faculty, future, governance, health education, implication, interprofessional education, light, math, medicine, multicultural education, novel coronavirus, online learning, outbreak, outcome, overview, part, past, period pharmacist, pharmacy education, potential, profession, report, response, schooling, special education student, special effort, special emphasis, special skill, stem, supply, teacher self-efficacy, teaching mathematics, today, trend, virtual reality, vulnerable population, way, wellbeing, and workforce.

(v) Cluster 5 which is marked in purple has 51 items, the 51 items are acceptance, action, area, aspect, attempt, attitude, barrier, call, commitment, compulsory education, concern, data science education, debate, decade, diversity, effort, evidence, fact, factor, failure, field, general education teacher, inclusion, inclusive education, inclusive learning environment, inclusive school, institution, kind, knowledge, lack, leader, medical education, music, post-secondary education, preservice, professional, programmed, quest, responsibility, scholar, school district, science, scope, section, sector, self-efficacy, special knowledge, special needs education, teacher, term, and theory.

(vi) Cluster 6 which is marked in blue has 51 items, the 51 items are academic, access, adoption, chemistry education, China, classroom, classroom practice, college, comprehensive school, conceptual framework, constraint, crisis, digital competence, distance, education field, education policy, efficiency, empirical evidence, era, focus, Germany, high school, idea, implementation, innovation, instruction, meaning, ministry, model, national education policy, peer, percent, performance, placement, policy, primary school, retention school, self-determination, service training, special education class,

special education school, special school, Sweden, system, teachers experience, teaching, test, type, universal design, and upper secondary school.

(vii) Cluster 7 which is marked in orange has 46 items, the 46 items are article, author, big data, biology, challenge, collection, context, contribution, dilemma, end, European journal, future research, higher education, history, hospitality, hospitality management, initial call, insight, intellectual disability, international journal, journal, journal special issue, management, management education, paper, perspective, physical education, priority, prime, process, provision, psychology, responsible management, rest, set, social justice, social science, solution, special science, solution, special issue, synthesis, tension, topic, vital role, woman and work.

(viii) Cluster 8 which is marked in brown has 39 items, the 39 items are approach, awareness, benefit. Center, creativity, family, identity, initiative, integrated stem education, language, mathematical education, need, new approach, non-formal education, nurse. Organization, participant, partnership, pattern, point, protective factor, question, race, range, reason, research, scientist, scoping review, service teacher, simulation, source, stress, support, systematic literature review, teacher education, technology, tool, transdisciplinarity, and wider range.

(ix) Cluster 9 which is marked in pink has 36 items, the 36 items are autism, basic education, case, course, degree, demand, dental education, department, educator, environment, expectation, girl, government, India, international perspective, investigation, law, mainstream school, online education, post, pre-service teacher, public education, rate, reality, service, social participation, special education service, special educator, special need, special needs child, state, student, Tanzania, United States, urgency, and US department.

(x) Cluster 10 which is marked in beige has 34 items, the 34 items are bachelor, differentiation, disability, education Centre, education student, educational experience, efficacy, England, everything, general education, health, IEP, kid, mainstream, one, participation, physics, population, pupil, relation, relationship, researcher, secondary education, Sen, sense, skill, social skill, something. Special education need, special education system, special educational need, special reference, traditional education, and view.

(xi) Cluster 11 which is marked in green has 28 items, the 28 items are adult, college education, comparison, definition, development, direction, education development, flipped classroom, formal education, growth, health professional education, human resource, impact, increase, individual, instructor, investment, nation, orientation, publication, return, school education, self, situation, strategy, time, value, and year.

(xii) Cluster 12 which is marked in light blue has 23 items, the 23 items are adolescent, basic, class, computer, critical thinking, educational process, Finland, global perspective, guidance, habit, information, information technology, integration, lesson, mean, modern approach, principle, resource, special attention, special support, study, subject and university education.

(xiii) Cluster 13 which is marked in light yellow has 21 items, the 21 items are capacity, choice, digital age, education system, effectiveness, entrepreneurship education, improvement, initial teacher education, literature review, mindfulness, place, positive attitude, potential area, program, series, social impact bond, Spain, special interest, staff, success, and university.

3.3. Visualization Special Needs Education Topic Area Using VOSviewer

VOSviewer can present network visualization (**Figure 2**), overlay visualization (**Figure 3**), and density visualization (**Figure 4**) in three different ways (Al Husaeni & Nandiyanto, 2022). In network visualization, relationships are represented by a network or a line that connects two terms (Nandiyanto & Al Husaeni, 2021; Al Husaeni & Nandiyanto, 2022; Al Husaeni & Nandiyanto 2023).
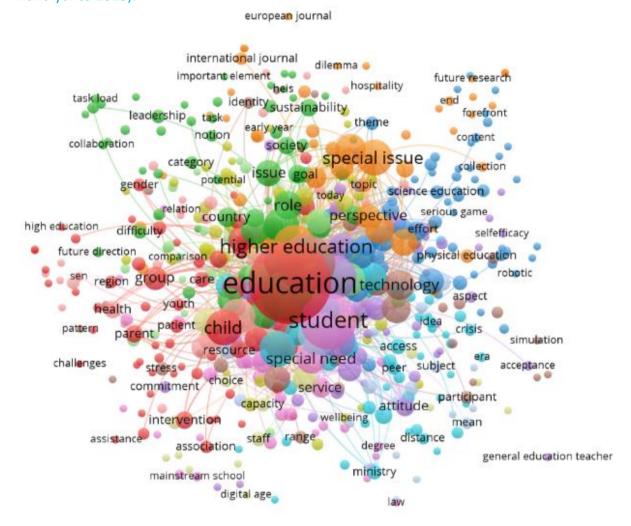

Figure 2. Network Visualization of Special Needs Education Keyword.

In the form of network visualization, **Figure 2** depicts the clusters of each topic area explored (Al Husaeni & Nandiyanto, 2023). The term "Special Needs Education" was utilized in this study as a keyword.

Figure 3 depicts the overlay visualization's shape. We can see the year that research on the terms we're looking for is most common in the overlay visualization. In May of 2018, the keyword "Special Needs Education" was extensively investigated. **Figure 4** depicts the density visualization method. We can see how frequently the term will be used in research using density visualization. The hue of a phrase can be used to assess how frequently it is used. The deeper the term's hue, the more frequently it is used.
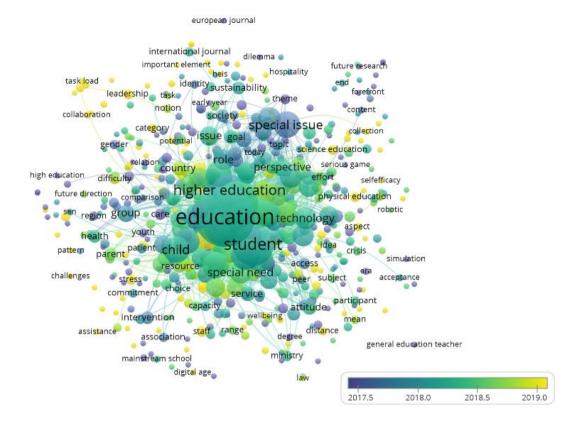
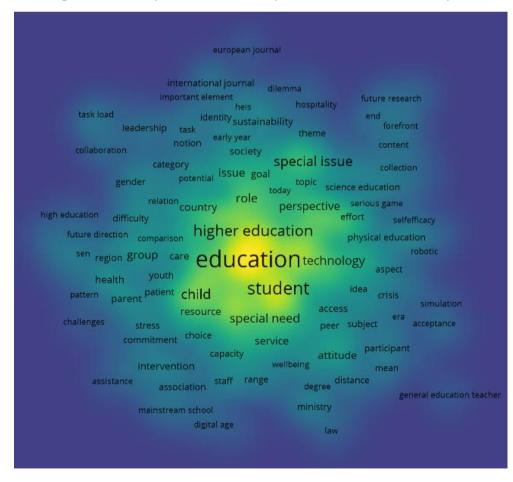**Figure 3.** Overlay Visualization of Special Needs Education Keyword.

Figure 4. Density Visualization of Special Needs Education Keyword.

4. CONCLUSION

The goal of this study is to combine the VOSviewer application's mapping with the terms "Special Needs Education." The data for this study was gathered using the Publish or Perish reference manager tool. The keyword "Special Needs Education" was used to filter the information received. Some of the bibliographic data used in this study included topics, titles, keywords, and abstracts. We found 400 relevant articles published between 2017 and 2021 based on our search results. According to the findings of this study, the number of papers on "Special Needs Education" has declined year after year. A search using the phrase "Special Needs Education" yielded 13 clusters, each with its own set of entries. Each cluster is marked with a circle of a different size. The size of each circle indicates how often or not the term is used.

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. (2023). 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. (2023). 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. (2023). Bibliometric analysis of high school keyword using VOSviewer indexed by google scholar. *Indonesian Journal of Educational Research and Technology, 3*(1), 1-12.

Buli-Holmberg, J., and Jeyaprathaban, S. (2016). Effective practice in inclusive and special needs education. *International Journal of Special Education, 31*(1), 119-134.

Hakala, K. (2010). Discourses on inclusion, citizenship and categorizations of 'special' in education policy: The case of negotiating change in the governing of vocational special needs education in Finland. *European Educational Research Journal, 9*(2), 269-283.

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.

Hasselbring, T. S., and Glaser, C. H. W. (2000). Use of computer technology to help students with special needs. *The Future of Children*, *10*(2), 102-122.

Hirvonen, M. (2011). From vocational training to open learning environments: vocational special needs education during change. *Journal of Research in Special Educational Needs, 11*(2), 141-148.

Koster, M., Pijl, S. J., Nakken, H., and Van Houten, E. (2010). Social participation of students with special needs in regular primary education in the Netherlands. *International Journal of Disability, Development and Education, 57*(1), 59-75.

Maryanti, R., Nandiyanto, A. B. D., Hufad, A., and Sunardi, S. (2021). Science education for students with special needs in Indonesia: From definition, systematic review, education system, to curriculum. *Indonesian Journal of Community and Special Needs Education, 1*(1), 1-8.

Meijer, C., Soriano, V., and Watkins, A. (2004). Special needs education in Europe. *Special Educational Needs and Inclusive Education: Inclusive Education, 2*, 331.

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.

Szymanski, E. M., Hanley-Maxwell, C., and Asselin, S. (1990). Rehabilitation counseling, special education, and vocational special needs education: Three transition disciplines. *Career Development for Exceptional Individuals, 13*(1), 29-38.