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Mapping The Trends Of Inclusive Education In Higher Education: A Bibliometric Review Using R Software

Khaerun Nisa [1] , Mayu Syahwela [2] , Awaluddin Tjalla[3], Iva Sarivah[4], Syarifah Halifah[5]
[1] Research and Education Evaluation, Pascasarjana Universitas Negeri Jakarta, Indonesia, kn.khaerunnisa@gmail.com
[2] Research and Education Evaluation, Pascasarjana Universitas Negeri Jakarta, Indonesia, mayu.syahwela@mhs.unj.ac.id
[3]Research and Education Evaluation, Pascasarjana Universitas Negeri Jakarta, Indonesia, awaluddin.tjalla@gmail.com
[4]Research and Education Evaluation, Pascasarjana Universitas Negeri Jakarta, Indonesia, ivasarifah@unj.ac.id.
[5]Early Childhood Education, IAIN Parepare, Indonesia,syarifahhalifah@iainpare.ac.id

Email Correspondence :kn.khaerunnisa@gmail.com

Abstract

Inclusive education within higher education plays a pivotal role in nurturing diversity and equity, ensuring equal opportunities for individuals with diverse abilities and backgrounds. The primary objective of this article is to trace the trends in the integration of inclusive education in higher education, encompassing the development of studies and identifying key components such as primary journals, authors, affiliations, countries, documents, and trending topics within the field. The methodology employed involves bibliometric analysis through the utilization of R software, utilizing Scopus data spanning from 2013 to 2023. The findings of this analysis reveal fluctuating growth in scholarly publications addressing inclusive education in higher education. Notably, the Sustainability Journal in Switzerland emerges as a prolific publisher, and the University of Nottingham stands out as the most productive affiliate. The United States is highlighted as the most productive country, with the article titled "Sustainability Strategy in Higher Education Institutions: Lessons Learned from a Nine-Year Case Study" by Ramisio et al. being the most cited. This research delineates the landscape of inclusive education in higher education, emphasizing existing challenges and opportunities, particularly within the context of Islamic higher education. While acknowledging inherent limitations, the study proposes addressing them through the inclusion of broader metadata sources and an extended publication timeline. The uniqueness of this research lies in its pioneering exploration of inclusive education in higher education through bibliometric analysis.

Keywords : *Bibliometric Analysis, Higher Education, Inclusive Education*

Abstrak

Pendidikan inklusi di pendidikan tinggi sangat penting untuk menciptakan lingkungan belajar yang beragam dan adil, serta memastikan kesempatan yang sama bagi individu dengan beragam kemampuan dan latar belakang. Pendekatan ini memperkaya pengalaman pendidikan secara keseluruhan, menumbuhkan kesiapan global siswa untuk menghadapi masyarakat yang beragam. Artikel ini bertujuan untuk menelusuri tren integrasi pendidikan inklusi di perguruan tinggi, mencakup pengembangan riset dan identifikasi komponen utama seperti jurnal utama, penulis, afiliasi, negara, dokumen, dan topik yang sedang tren dalam bidang tersebut. Metodologi yang digunakan melibatkan analisis bibliometrik dengan menggunakan perangkat lunak R, dengan memanfaatkan data Scopus dari tahun 2013 hingga 2023. Temuannya menunjukkan bahwa pertumbuhan publikasi ilmiah tentang implementasi pendidikan inklusi di pendidikan tinggi mengalami fluktuasi. Sustainability Journal (Swiss) muncul sebagai penerbit artikel paling produktif mengenai topik ini, dan Universitas Nottingham adalah afiliasi paling produktif. Amerika Serikat menonjol sebagai negara paling produktif, dan artikel berjudul “Strategi Keberlanjutan di Institusi Pendidikan Tinggi: Pelajaran dari Studi Kasus Sembilan Tahun” oleh Ramisio dkk. memegang keunggulan sebagai yang paling banyak dikutip. Penelitian ini menguraikan pendidikan inklusi dalam pendidikan tinggi bagi para peneliti yang berminat, menekankan tantangan saat ini dan peluang potensial dalam menerapkannya, khususnya dalam pendidikan tinggi Islam. Artikel ini mengakui keterbatasan yang dapat diatasi melalui sumber metadata yang lebih luas dan jangka waktu publikasi yang lebih lama. Lebih lanjut, kebaruan dari penelitian ini adalah belum ada

peneliti sebelumnya yang mengeksplorasi pendidikan inklusi di perguruan tinggi dengan menggunakan analisis bibliometrik.

Kata kunci : Analisis Biobliometrik, Pendidikan Tinggi, Pendidikan Inklusi

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1. Introduction

Inclusive education in higher education is an issue that is increasingly gaining global attention due to the importance of creating an inclusive and welcoming educational environment for all individuals (Anshory, 2018; Choy, 2017; Clouder, 2019; Dalton, 2019; Kaliisa, 2019; Rillotta, 2020; Tilak, 2015). The presence of inclusive education in tertiary institutions is very important in modern society because it represents the basic principle of human rights, which is the right of every individual to receive education without discrimination.(Hewett, 2017, 2020). This includes all students, including those who have disabilities or special conditions (Bartz, 2020). Integrating students with special needs into the higher education system reflects the university's commitment to equality and justice, and according to Gairín and Suárez in 2014(Moriña, 2017)this is the hallmark of a quality university. In the context of inclusive education at universities, it can be defined as a model that proposes an educational model in which all students can learn, participate, and be accepted as valuable members of the university.

In addition, inclusive education in higher education plays an important role in enriching the learning experience of all students. In an inclusive environment, students have the opportunity to interact with a variety of individuals who have different backgrounds, abilities, and perspectives. This not only broadens their understanding of the world but also prepares them to work in an increasingly multicultural and diverse society. Furthermore, inclusive education in higher education can help improve the overall quality of education. When education is designed to accommodate various learning styles and student needs, the learning process becomes more effective and beneficial for all. This means that every student has an equal opportunity to reach his or her full potential, which in turn can produce more skilled and knowledgeable graduates(Walker, 2017). Lastly, in the current context of globalization and the knowledge-based economy, universities must prepare students to compete in an increasingly competitive job market. Implementing inclusive education helps create graduates who have better adaptability, empathy, and a better understanding of human diversity, all of which are important attributes in the ever-changing world of work(Jivet, 2020; Navarro-Mateu, 2019; Ryan, 2019).

In order to achieve this goal of inclusive education, universities must commit to providing the facilities, resources, and support needed by all students, regardless of their background or conditions. This is a long-term investment that will support the building of a more inclusive and equitable society. Therefore, inclusive education in higher education is not only a moral imperative but also a wise and strategic policy for the future. Considering that universities have an important role in improving the quality of life in society, considering their great relevance in economic and social decision-making, their capacity to increase employment opportunities, and their contribution to social exclusivity (Lipka, Forkosh-Baruch, & Meer, 2019). In support of increased inclusivity within universities, many have called for this and claimed that it should be the responsibility of universities to respond to the needs of all students.

However, despite the efforts made by universities to increase inclusivity in higher education, such as creating regulations that guarantee student rights, disability support offices, and training teaching staff in inclusive education, the literature shows that there is still much to be achieved. This is reflected in the fact that, despite the commitment to guarantee access for students with disabilities, the dropout rate for this group is still high. Apart from that, it cannot be denied that the differences in abilities and commitment of universities in various parts of the world are also an important key to successfully realizing inclusivity in higher education. So, it is not surprising that there is research that states that "universities are one of the most discriminatory institutions, both in terms of access for

certain students, such as students with disabilities, and in facilitating their continuation in higher education so that they do not abandon their careers." their education before earning a degree."

Based on the description above, universities still face many challenges in realizing inclusivity, so studies related to this matter are very necessary in order to unravel and alleviate the problems faced by universities and achieve the goal of equal and just education for all. In this article, the author attempts to map research trends regarding the implementation of inclusive education in higher education to provide an overview for further research. The mapping process in this article was carried out using bibliometric analysis, which focuses on scientific publications, collaborations, and citations. In carrying out the process of mapping the implementation of inclusive education in higher education, the author refers to the research questions: how is the development of studies on the implementation of inclusive education in higher education?, what are the main journals, authors, affiliations, countries, and documents in the field of inclusive education in higher education?, what are the trending topics related to the implementation of inclusive education in higher education?, what is the classification of themes for implementing inclusive education in higher education?, and what implementations of inclusive education in higher education provide opportunities for further research?

2. Method Research

Research on the implementation of inclusive education in higher education uses bibliometric analysis. Bibliometric analysis is a branch of quantitative research methods that focuses on analyzing trends in the literature on a particular theme, and the results can be used as a reference for future research(Alryalat et al., 2019; Donthu et al., 2021; Muhuri et al., 2019). Bibliometric analysis in this research was used to better understand trends in the discussion of themes related to the implementation of inclusive education in higher education in international publications. This research focuses on mapping articles related to the implementation of inclusive education in tertiary institutions indexed by Scopus (scopus.com) and published from 2013 to 2023. In its implementation, this research used five stages, including determining keywords, searching for articles, selecting articles, and data analysis. The first stage is determining keywords. Based on the research questions, the keywords used in this research are implementation of inclusive education in higher education. The second stage is an article search; the keywords that have been determined are then used to search for articles in the Scopus database (scopus.com). The third stage is article selection. The selection of articles was carried out based on the inclusion criteria determined by the researchers in this study. The inclusion criteria for this research are: 1) articles indexed by Scopus and published from 2013 to 2023; 2) the type of document is only articles, while book chapters and conferences are included in the exclusion criteria; and 3) articles in English. These inclusion criteria can be applied simultaneously in the article search process, as follows:

TITLE-ABS-KEY (implementation AND of AND inclusive AND education AND in AND higher AND education) AND (LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2023)) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (LANGUAGE , "English"))

Figure 1. Screenshot from browsing articles in Scopus The fourth stage is data analysis

The fourth stage is data analysis. Article search results obtained from the Scopus database were then processed using the bibliometric package available in R software (Dervis, 2019; Moral-Muñoz et al., 2020; Wani, 2022). The data processing stages consist of article selection and validation. Both selection and validation of articles are carried out in the form of diagrams and data tables, which are categorized into several types. The data processing process in R software will produce two main pieces of information: research performance and science mapping. Research

performance is an explanation regarding the main information, the most relevant sources, the most relevant authors, the most relevant affiliations, the country's scientific production, and documents. Science mapping is the result of processed data related to trend topics, co-accurance networks, thematic maps, thematic evaluations, co-citation networks, histographs, collaboration networks, and world collaboration maps.

3. Results and Discussion

The number of studies on the implementation of inclusive education in higher education from 2013 to 2023 was identified as fluctuating, although from 2020 to the 3rd quarter of 2023, it tends to increase. The bibliometric analysis in this article successfully analyzes the contributions of individuals, institutions, and countries regarding research trends in the implementation of inclusive education in higher education. Several things that are considered in the contribution analysis process in this article are the journals that publish the most articles on the implementation of inclusive education in higher education, the countries that are most active in producing articles, the most productive authors, and the authors with the most citations. highest. Apart from that, this article also tries to map the interactions between issues or topics related to the implementation of inclusive education in higher education. The mapping carried out is related to intellectual interactions and structural relationships between research constituents. Some of the things considered in the scientific mapping process in this article are popular topics used as research themes regarding the use of information technology in the implementation of inclusive education in higher education, the relationship of one issue to another, the density and center of interest of a topic, as well as related mapping. research collaboration between institutions and countries.

3.1 Development of Research Literature on the Implementation of Inclusive Education in Higher Education

Based on data collected from the Scopus database, the amount of literature discussing the implementation of inclusive education in higher education tends to fluctuate. From 2013 to 2015, there was an increase. In 2016, it decreased and then increased again from 2017 to 2018, and in 2019, it experienced a decrease, although not significant. After that, from 2022 to 2022, the number of publications continues to increase quite significantly, until in the 3rd quarter of 2023, the calculated number of publications appears to have decreased, although the difference is not significant with the number of publications in 2022, so it is possible that publications will accumulate in 2023 and there will be an increase from the previous year.

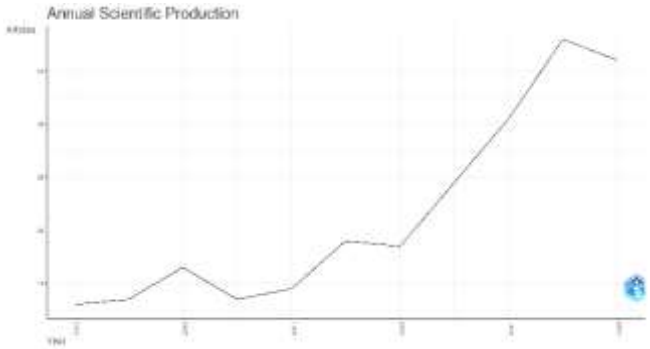

Figure 2. Annual scientific products related to the implementation of inclusive education in higher education

Based on Figure 2, in 2013, only 6 articles were published regarding the implementation of inclusive education in higher education. In 2014, the number increased to 7 articles. An increase in article publications also occurred in 2015, namely 13 articles. Then in 2016 it decreased to 7 articles. In 2017 and 2018 the number of articles published increased, namely 18 articles. Then in 2019 there was another decrease in the number of articles, namely 17 articles, although the decrease was not significant because there was only one less article than the previous year. After experiencing fluctuations for 7 years, the production of articles on the implementation of inclusive education in higher education continues to increase from 2019 to 2022, namely from 29 articles to 56 articles. Meanwhile, in the 3rd quarter of 2023, the number of article publications still did not show a significant increase, namely 52 articles. However, this still allows for additional article publications until the 4th quarter of 2023.

3.2 Main journals, affiliates, countries, and documents in the field of inclusive education in higher education

The first section explains the journals that are most productive in publishing articles related to the implementation of inclusive education in higher education.

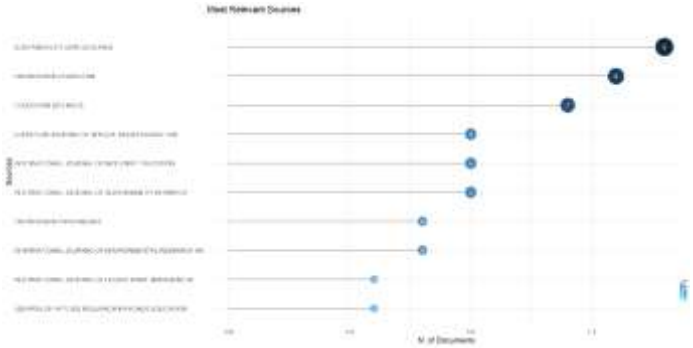

Figure 3. The most productive journals publish articles related to the implementation of inclusive education in higher education

Based on Figure 3, information is obtained that the ten productive sources publishing articles about the implementation of inclusive education in higher education from 2013 to 2023 are dominated by the journal Sustainability (Switzerland), which published nine articles. The Frontiers in Education journal was ranked 2nd with a total of 8 article publications, including (H. Y. Lee, 2022; Zhao, 2021). rd position by the Education Sciences Journal, namely 7 article publications, including (Aguirre, 2021; Ismail, 2022; Killpack, 2016; Pichardo, 2021). he difference in the number of publications in the three journals does not show great significance. Furthermore, in positions 4, 5, and 6, there are the European Journal of Special Needs Education(Emmers, 2020; Hewett, 2017; Sharma, 2018), International Journal of Inclusive Education (Bunbury, 2020; Gibson, 2015; Meskhi, 2019a, 2019b; Saloviita, 2018), and International Journal of Sustainability in Higher Education(Argento, 2020)which have five article publications each. In positions 7 and 8, there are the journals Frontiers in Psychology and International Journal of Environmental Research and Public Health, with four article publications each. And in positions 9 and 10, namely the International Journal of Educational Management and the Journal of Applied Research in Higher Education, each with three article publications.

The second section describes the institutions that are most productive in producing articles about the implementation of inclusive education in higher education. The results are shown in the image below.

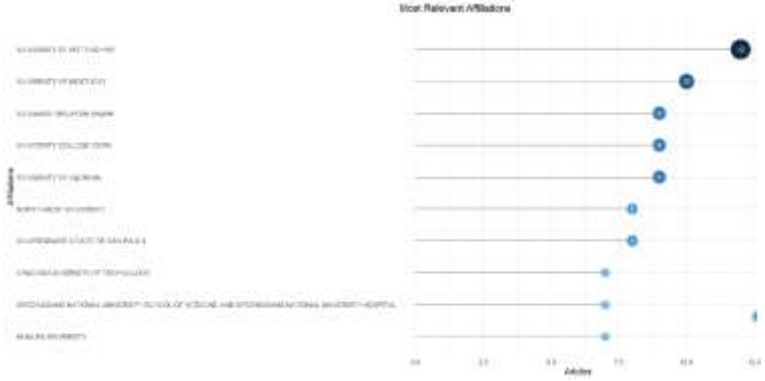

Figure 4. The most relevant affiliations in the implementation of inclusive education in higher education

In Figure 4, information is obtained regarding the institutions that are most productive in producing articles about the implementation of inclusive education in higher education. The University of Nottingham is the most prolific institution, with 12 articles published. Then, in second place, is the University of Kentucky, which has produced 10 articles. Universiti Malaysia Sabah, University College Cork, and the University of Georgia are in third, fourth, and fifth positions with nine published articles each. North-West University and Univesidade Cidade de Sao Paulo ranked sixth and seventh, respectively, with each publishing 8 articles. Cracow University of Technology, Gyeongsang National University School of Medicine, Gyongsang National University Hospital, and Khalifa University are in eighth, ninth, and tenth positions, with seven articles published each. This information provides an overview of the productivity of these institutions in producing articles about the implementation of inclusive education in higher education.

Third section explains the countries that are most productive in producing articles related to the implementation of inclusive education in higher education. Collaboration in article publication, both internal and external to countries, can also be seen in Figure 5. Collaboration on articles within countries is given a turquoise SCP code,

while article collaboration between countries is given an orange MCP code. The distribution of articles in various countries can be seen in the image below.

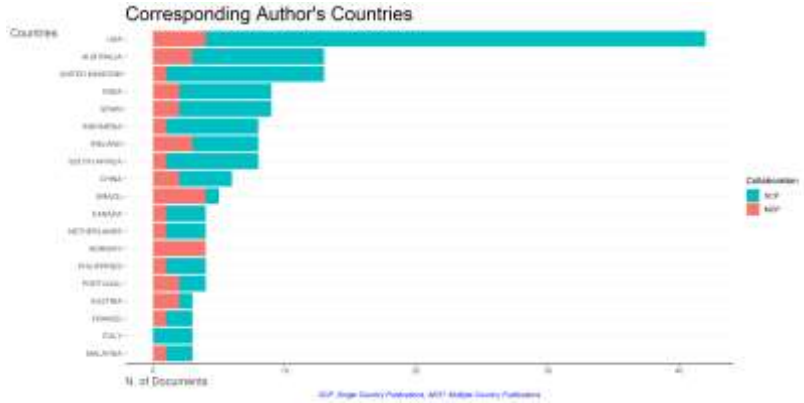

Figure 5. Graph of state scientific production related to inclusive education in higher education

Based on data analysis from the Scopus database in Figure 5, the USA is the country that produces the most articles on the implementation of inclusive education in higher education, with a total of 42 articles, with 38 articles collaborating with internal USA authors and only 4 collaborating with other countries. Australia and the United Kingdom are in second and third place, each publishing 13 articles on this topic. Australia produced 13 articles; 10 articles were collaborations within the country, while the other 3 articles were the result of collaborations with other countries. Meanwhile, the United Kingdom also produced 13 articles; 12 articles were the result of collaboration within the country, while 1 article was the result of collaboration with another country. Next, India and Spain are in fourth and fifth positions, with a total of nine articles each. Likewise, in terms of collaboration within each country, 7 articles and 2 other articles were the result of collaboration with other countries. Then, Indonesia, Ireland, and South Africa were in sixth, seventh, and eighth positions, each producing eight articles. Indonesia and South Africa each produced seven collaborative articles within the country, while one article was the result of collaboration with another country. As for Ireland, of the 8 articles, 5 were produced as a result of collaboration within the country, while the other 3 were produced as a result of collaboration with other countries. In tenth place is China, with a total of six articles published; four are the result of collaboration with authors within the country, and two are the result of collaboration with authors from other countries. This information shows the contribution of countries to producing articles about the implementation of inclusive education in higher education.

The fourth section provides information regarding the most frequently cited articles. The table below presentsthe results in order from the ten most frequently cited articles on the implementation of inclusive education in higher education.

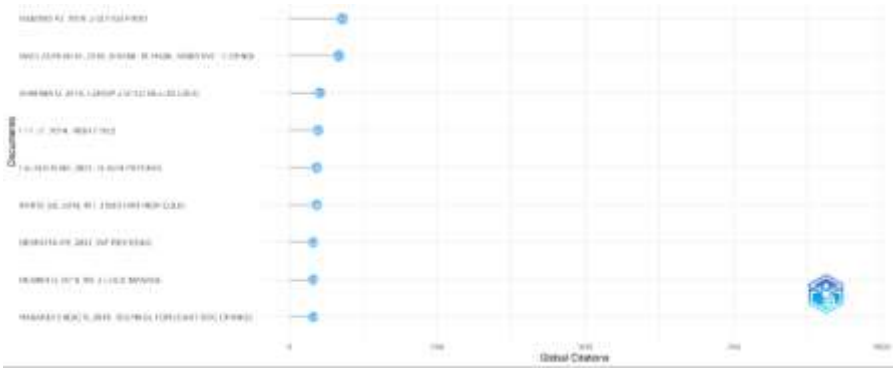

Figure 6. The most cited articles related to the implementation of inclusive education in higher education

Based on the data in Figure 6, articles written by Ramisio in 2018 have been cited 89 times (Ramísio, 2019). The second position is an article written by Maclachlan M. in 2018 with 83 citations(MacLachlan, 2018). he second position is an article written by Maclachlan M. in 2018 with 83 citations (Sharma, 2018). In fourth place, an article written by Lee JT in 2014 has been cited 48 times (J. Lee, 2014). Articles written by Fuentes MA in 2021 and White SS in 2014 occupy the fifth and sixth positions, respectively, with a total of 46 citations(Fuentes, 2021; White, 2014). Furthermore, articles written by Devkota KR in 2021 (Devkota, 2021), Meskhi B in 2019 (Meskhi, 2019a), and Hasanefendic in 2016 were ranked seventh, eighth, and ninth with a total of 40 citations, respectively. These data provide an idea of the popularity and influence of these articles in the academic world, measured by the number of citations received.

The fifth section explains the trending themes most frequently associated with inclusive education in higher education each year from 2013 to 2023. Data comes from keywords included by the author in articles published in Scopus.

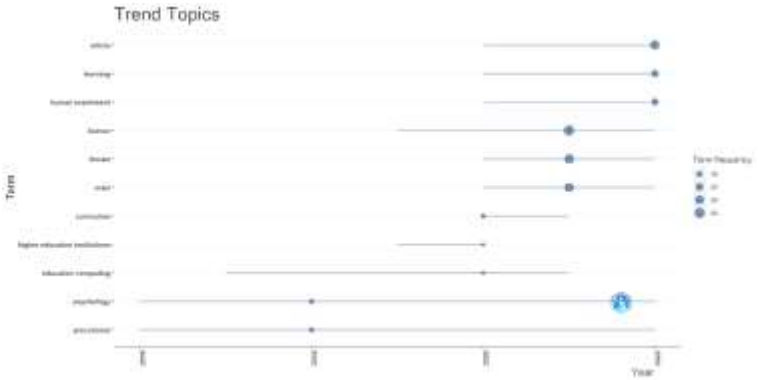

***Figure 7**. Trends in themes most frequently associated with the implementation of inclusive education in higher education*

Based on Figure 8, information is obtained that the keywords procedure and psychology have become a trend in the publication of articles related to the implementation of inclusive education in higher education, starting in the first quarter of 2016, mid-2018, until the third quarter of 2022. Meanwhile, the keyword curriculum began to appear in the first quarter of 2018. first quarter of 2020 to the third quarter of 2022. The keyword education computing started to appear in the first quarter of 2017, mid-2020, and continued until the third quarter of 2021. Furthermore, the keyword higher education institutions started to appear in the first quarter of 2019, mid-2020, and until the third quarter of 2020. Furthermore, the keyword human appears in many publications related to the implementation of inclusive education in higher education, with a fairly high density in the first quarter of 2019, mid-2020, and until the third quarter of 2022. Likewise, the keywords female, male, article, and learning are widely used starting in the first quarter of 2019, mid-2021, and 2022, until the third quarter of 2022.

The section six explains the grouping of topics most often associated with the implementation of inclusive education in higher education each year from 2013 to 2023.

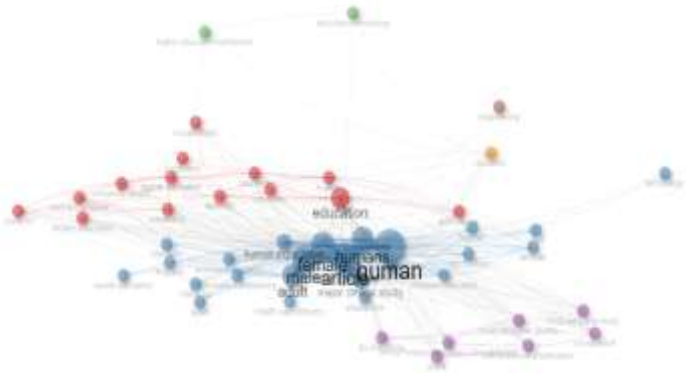

Figure 8. Grouping of topics most often associated with the implementation of inclusive education in higher education

Based on the results of bibliometric analysis using R Studio in Figure 8 with the keyword implementation of inclusive education in higher education, six clusters were formed, namely: Cluster 1 consists of 24 topics, namely human, humans, article, female, male, adult, major clinical study, adolescent, health care delivery, aged, human experiment, qualitative research, England, interview, health education, teacher, psychology, inclusive education, attitude, child, information processing, questionnaire, technology, and follow-up. Cluster 2 consists of fourteen topics, namely education, student, teaching, learning, university, leadership, higher education, university sector, thematic analysis, COVID-19, curriculum, procedures, tertiary education, and sustainability. Cluster 3 consists of seven topics, namely HIV infections, human immunization, efficiency virus infection, pre-exposure prophylaxis, young adults, cross-sectional studies, and cross-sectional studies. Cluster 4 consists of two topics, namely higher education and educational computing. Cluster 5 consists of one topic, namely students. Cluster 6 consists of one topic, namely engineering.

This section seventh explains the grouping of research themes based on their level of frequency and relevance. In the context of density, the higher the position indicates that the research theme has been researched frequently. Meanwhile, centralization refers to the extent to which the theme is relevant to the development of research on the implementation of inclusive education in higher education. Further to the right means the theme is more relevant and

has a greater influence on the main topic being researched. An analysis of the density and centralization of research themes related to the implementation of inclusive education in higher education is presented in the quadrants below..

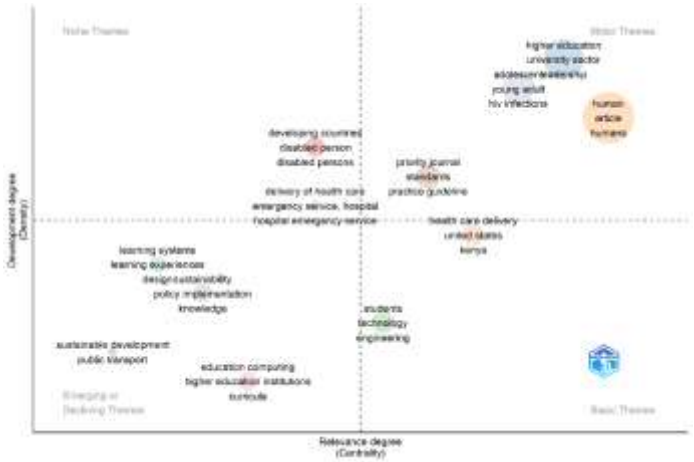

Figure 9. Quadrants regarding density and centralization of research themes related to the implementation of inclusive education in higher education

The quadrant above provides information related to research themes based on their position. There are four quadrants for analyzing the thematic map in Figure 10, namely:

a. Top Right Quadrant: motorbike theme; This quadrant represents the most frequently researched and most relevant themes in the study of the development of inclusive education in higher education. This quadrant is located to the right (centralization) and above (density). Among the themes in this quadrant are higher education, the university sector, leadership, standards, practice guidelines, adolescents, young adults, HIV infections, humans, and articles.
b. Bottom Right Quadrant: Basic Themes; The themes in this quadrant are included in the central theme category because they have relevance to studies of the implementation of inclusive education in higher education. Although relevant, the themes included in this quadrant are rarely researched, so they still have a relatively low level of density. The themes contained in this quadrant include health care delivery, the United States, Kenya, students, technology, and engineering.
c. Bottom Left Quadrant: Emerging or declining themes; this quadrant has two possible themes. Existing themes are starting to be abandoned or, conversely, becoming popular for research purposes. If it is in decline, these themes should not be the focus of research. However, if these themes become popular, then it becomes a good opportunity to use them as research topics. Further research is needed by reading in more detail the articles whose themes fall into this quadrant to find out which themes are starting to be abandoned or, conversely, gaining popularity for research. The themes contained in this quadrant are learning systems, learning experiences, design sustainability, policy implementation, knowledge, sustainable development, public transportation, education computing, higher education institutions, and curricula.
d. Top Left Quadrant: Niche Themes (a very niche theme); This quadrant shows a grouping of research themes that can be central and related to the implementation of inclusive education in higher education but have a high level of density because they are often researched. The themes in this quadrant include developing countries, disabled people, the delivery of health care, emergency services, hospitals, and hospital emergency services.

The results of the World Collaboration Map show the network of collaboration between countries related to research on the implementation of inclusive education in higher education. This pattern of cooperation is reflected in the thickness of the lines formed, indicating a high frequency of conducting joint research. The thicker the line, the more often the research was carried out collectively. In addition, the increase in the number of "lines to countries" indicates an increasing level of cooperation by the countries concerned. The World Collaboration Map depicts significant cross-country collaboration in research on the implementation of inclusive education in higher education.

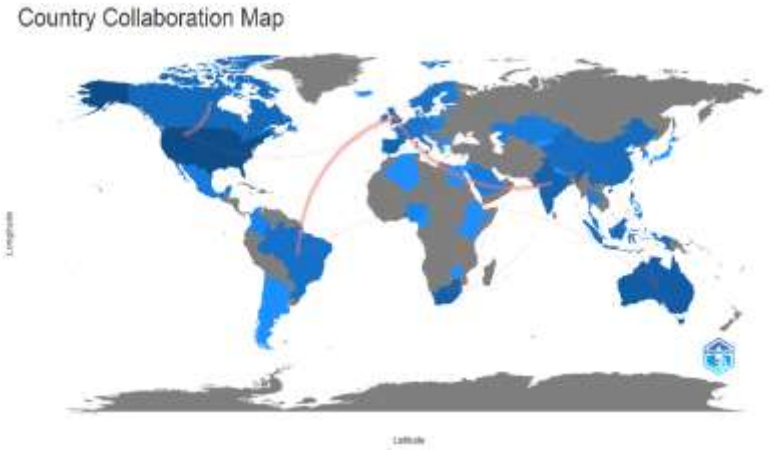

***Figure 10**. Map of collaboration between countries regarding the implementation of inclusive education in higher education*

Referring to Figure 10, information is obtained that the country that collaborates the most with other countries in publishing articles related to the implementation of inclusive education in higher education is Australia. Australia has collaborated on publications with 22 countries. The countries with the most collaborative article publications with Australia are Brazil, Ireland, Italy, and Norway, twice each. Meanwhile, the countries with the highest frequency of collaborating with the same country are the UK and Brazil, the USA and Canada, as well as the UK and India, each of which has collaborated on article publications three times.

4. Conclusion

Studies on the implementation of inclusive education in higher education from 2013 to 2023 show that the numbers fluctuate and tend to increase. The bibliometric analysis in this article also shows the Sustainability Journal (Switzerland) as the most productive in publishing articles on this topic, the University of Nottingham as the most productive affiliate, the USA as the most productive country, and the article Sustainability Strategy in Higher Education Institutions: Lessons Learned from a Nine-Year Case Study by Ramisio et al. as the most cited article. This information can be used as a reference for future researchers who want to learn more about the implementation of inclusive education in higher education. Another important aspect that researchers need to pay attention to if they want to conduct further research are topics or issues that are currently popularly associated with inclusive education in higher education. Based on the results of the analysis in this article, future researchers are advised to pay attention to the themes in cluster one in the theme classification sub-chapter. Then, to determine the density and centrality of a theme, future researchers are advised to pay attention to the themes in the upper right quadrant in the sub-chapters on topics that provide opportunities for further research. This article also provides information regarding the potential for collaboration between institutions and countries, which can be used as a reference for researchers who want to build relationships related to further studies related to the implementation of inclusive education in higher education. Additionally, this research outlines inclusive education in higher education for interested scholars, emphasizing current challenges and potential opportunities in implementing it, particularly in Islamic higher education. The results of this bibliometric analysis are not optimal. Researchers set several limitations. Metadata taken from only the Scopus database is specific to the journal. This article also focuses on the analysis of publications published between 2013 and 2023. Research conducted outside of these years was not included in the analysis process. Limitations in this article can be resolved through further research on the same theme.

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