Journal of Information Systems Engineering and Management
2025, 10(3s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Educational Leadership in Vocational Education: A 10-Year Bibliometric Analysis

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ARTICLE INFO

Received: 07 Oct 2024
Revised: 30 Nov 2024
Accepted: 19 Dec 2024

ABSTRACT

Introduction: Educational leadership in vocational education is a complex and important topic. Nevertheless, there is still a deficiency in academic discourse regarding the bibliometric analysis of this body of knowledge.

Objectives: This study aims to give a summary of the development of this topic by locating publications indexed in the Scopus database between 2014 and 2024.

Methods: Educational leadership in vocational education-related research has garnered significant scholarly attention for more than fifty years, yielding a large corpus of literature on the domain. Using keywords like "vocational education" and "educational leadership," the search produced a total of 15315 articles at first. After applying exclusion and inclusion criteria, 2089 studies were kept for final analysis. The research includes the most prolific researchers, top 10 journals, yearly article frequency, composition of articles, top 10 contributing countries, the most influential articles, and the most frequently used keywords.

Results: The study's main contribution is to highlight the bibliometric insights gained through in-depth analysis regarding educational leadership in vocational education. Additionally, universities, trends, and nations are displayed and analyzed.

Conclusions: The conclusions provide useful insights for academics into the precise growth of educational leadership in vocational education through organizing the field's body of existing literature.

Keywords: Educational Leadership, Vocational Education, Bibliometric Analysis, Educational Management, Leadership Trends.

INTRODUCTION

The term "educational leadership" is very relevant in worldwide education practice, although the notion of the teacher-leader has changed significantly throughout the 20th century [1]. At the center of the current educational discussion is educational leadership, which is a crucial component of “school or institute management” and has a major role in improving the standard of the educational process [2]. The sociology of science can be explored and linkages between journals, authors, and organizations can be clarified by analyzing massive datasets derived from bibliographies, as stated by Holden et al. (2005) [3]. Researchers are becoming more interested in bibliometric analysis to make use of these advantages, not just in the educational sciences but also in other fields [4],[5],[6].

Graduates of vocational education are generally prepared to perform practical work and are especially capable of creating new jobs [7]. In business and educational institutions alike, leaders are crucial. These days, administrators are expected to be involved in a variety of areas, including “finance, academic performance, community, and public relations”, in addition to leading both teachers and students [8]. Vocational education is defined as instruction with a curriculum customized to the subjects and levels of proficiency of the students [9]. The process of obtaining

“technical skills and knowledge” for industry is critical, and it involves "Technical and Vocational Education and Training" (TVET). To enhance the TVET system and produce skilled labor, numerous countries are making investments in their human resources. TVET lessens reliance on foreign labor and advances “socioeconomic development” [10].

There is currently a paucity of research using “bibliometric analysis” on the development of educational leadership in vocational education. The research questions for this paper are as follows:

- Which articles concerning instructional leadership in vocational education have been published more frequently over the years?
- Based on the publications in Scopus, which authors are the most prolific?
- Which journals, indexed in Scopus, are the most productive?
- Which nations and organizations exhibit the highest production rate, in the fields of vocational education and educational leadership research?
- According to the overall number of citations, which articles are the most frequently cited?
- Which author keywords appear most frequently in studies on vocational education and educational leadership?

Employing an extensive examination of the correlation between keywords and the ensuing clusters, the study reveals the intricacy of this subject. Furthermore, the fact that this topic has been the focus of numerous research in recent years emphasizes how important and relevant educational leadership is in the modern world.

LITERATURE REVIEW

A leader's purpose setting and motivation, along with the methods used to elicit desired behavior, are contentious topics requiring specialized research and studies. There is a wealth of academic and practical writing on the theories and development of leadership. House and Adity (1997) [11] described the development of the key ideas that impacted the science-based notion of leadership during the 20th century. Nonetheless, the start of the twenty-first century saw a surge in interest in this issue [1]. Identifying and characterizing leadership styles from traditional and modern viewpoints [12], as well as creating leadership models [13], have been the subjects of several research. Of particular note, Flamholtz and Randle (2007) [14] were the first to create a matrix of leadership types. Further research was done to examine the differences in desire for three different types of leadership “transformational, transactional, and laissez-faire” that are influenced by certain sociodemographic factors (“age, gender, and position”) [15].

One crucial element is the concept's generalizability to other fields, such as education [16]. As a result, the idea of “educational leadership”, or “teacher leadership”, has been identified, changing dramatically over the 20th century. To guarantee high-quality education, the American teaching profession was called to become more professional in the early 1980s, which gave rise to the idea of educational leadership. Little J. W. (2003) [17] suggests that the teacher-leader concept is crucial for “reforming and revitalizing” the teaching profession. It suggests that teachers should become reflective practitioners, actively participating in decision-making at all levels, rather than just technocrats or executors. As educational leadership has gained popularity over the past 20 years, teachers are expected to assume more leadership roles [18].

To accomplish educational change, the “teacher-leader” role has become crucial [19]. The goal of developing teacher-leaders, according to authors Katzenmeyer and Moller (2001) [20], is to guarantee educational quality by raising the caliber of teaching staff. Teachers' perceived leadership roles, regardless of hierarchical structures, enhance education and influence the continuous improvement of instructional strategies, enhancing student class and personal and organizational development [21]. Teachers can adopt a leadership role, guiding students, influencing classroom dynamics, acting as friends, and providing role models. They can also serve as substitutes for parents and analyze instructional strategies viewed from an educational leadership perspective [22], [23]. School leadership has 6 models of “educational management”: “subjective, frontal, collegial, ambiguous, political, and cultural”, focusing on alignment with institutional goals, the validity of structures, relationship with the external environment, and suitable leadership strategies [24]. The “University of Cambridge” initiated the “International Teacher Leadership” initiative in 2008, based on research on pedagogical leadership styles and principles in the UK, to enhance the professionalism of pedagogical staff [25], [26], [27].

In contrast to basic education and general undergraduate education, vocational education has a closer relationship with “economic and social development”. Its goal is to cultivate technically and skillfully trained workers who will support social and economic construction, making it an important part of education in every country [8]. The quality of “technical and vocational education” was evaluated by Kichu (2021) [28] using NAAC measures. According to Oduma (2007) [29], the majority of TVET departments at universities lack “well-equipped laboratories, functional facilities, and workshops”.

Deebom & Tambari (2017) [30] showed that “inappropriate teaching materials, unstructured workshops, and financial constraints” are some of the barriers to the execution of TVET. Thus, even though there is a large amount of literature on vocational education and educational leadership, it is notable that very less bibliometric investigations have been conducted [31]. This research uses bibliometric analysis to try and fill this vacuum in the academic literature.

RESEARCH METHODOLOGY

Research Objective

This paper investigates the importance and development of educational leadership and vocational education concepts with the help of a bibliometric lens.

The Search Strategy

The “Scopus database” was utilized to obtain the relevant information because of its ability to fine-tune searches in the fields of educational leadership and vocational education-related research. Articles on the subject are streamlined when the keywords "vocational education" and "educational leadership" are used. The process of choosing the database (Scopus), timespan (2014–2024), relevant keywords, subject areas, and different exclusion and inclusion criteria is shown in Table 1.

Table 1: Criteria used for articles shortlisting
(Source – Scopus Database)

Selection Criteria	Eliminated	Accepted
Database: “Scopus”		
Date of Search: “30 Aug. 2024”		
Initial search result (on the search term): “educational leadership” and “vocational education” (1910-2024)		**28572**
Period of Publications: 2014 to 2024	13257	**15315**
Subject area: “Social science, Business management, and accounting”	6223	**9092**
Publication type: “Articles”	2642	**6450**
Publication stage – Final. Source Type – Journal. Language screening: Documents published in English only.	1050	**5400**
Specific keywords – “Vocational education” and “educational leadership”	2895	**2505**
Incomplete Records Eliminated	02	**2503**
Duplicate Records Eliminated	04	**2499**
Screening (based on content)	410	**2089**

Data analysis

The procedure suggested by Zupic and Cater (2015) [32] was followed when doing data analysis using “VOS viewer software”. The research design involves creating a research question, selecting a bibliometric approach, gathering data, visualizing it, conducting analysis using software tools, interpreting the results, focusing on key insights, using scientific mapping and educational leadership analysis techniques [33], [34], [35], [36].

RESULT ANALYSIS

The essential data for the publication trends is shown in Table 2. The study essentially looked at 2189 journal articles that were published between 2014 and 2024 across 770 sources indexed in the Scopus database. The table 2 shows that the average number of citations per article is 10.74, and an average yearly growth rate of 4.35%. There are 3507 "keyword plus" keywords and 5728 "author's keywords." There are 477 authors of articles with just one author and 1704 articles with two or multiple authors.

Table 2: Publications Trends for Educational leadership and vocational education
(Source: Scopus database, 2014–2024; authors' compilation)

Description	Results		Description	Results
Information About Extracted Data			**Document Types**	
Span of Review Selected	2014:2024		Articles	2189
Various Sources	770		Authors Collaboration	
Total Documents	2189		Single Authored Documents	477
Annually Growth Rate %	4.35		Per Document Co-Authors	3.03
Document's Average Age	4.59		International Co-authorships	17.63
Document's Citations (Average)	10.74		**Authors**	
Total References	95880		Total Authors	5689
Document Contents			Authors of Single Authored Documents	427
Keywords Plus	3507			
Author's Keywords	5728			

The study's spatial frequency distribution related to vocational education and educational leadership was the subject of the first research investigation. Figure 1 shows the dispersion of frequencies of articles published year between 2014 and 2024. Over ten years, 2089 articles, have been published in Scopus. With 258 papers produced overall, 2023 was the most productive year. In addition, 665 articles were published in the recent three years (2022–2024), suggesting a significant focus on the subjects of vocational education and educational leadership.

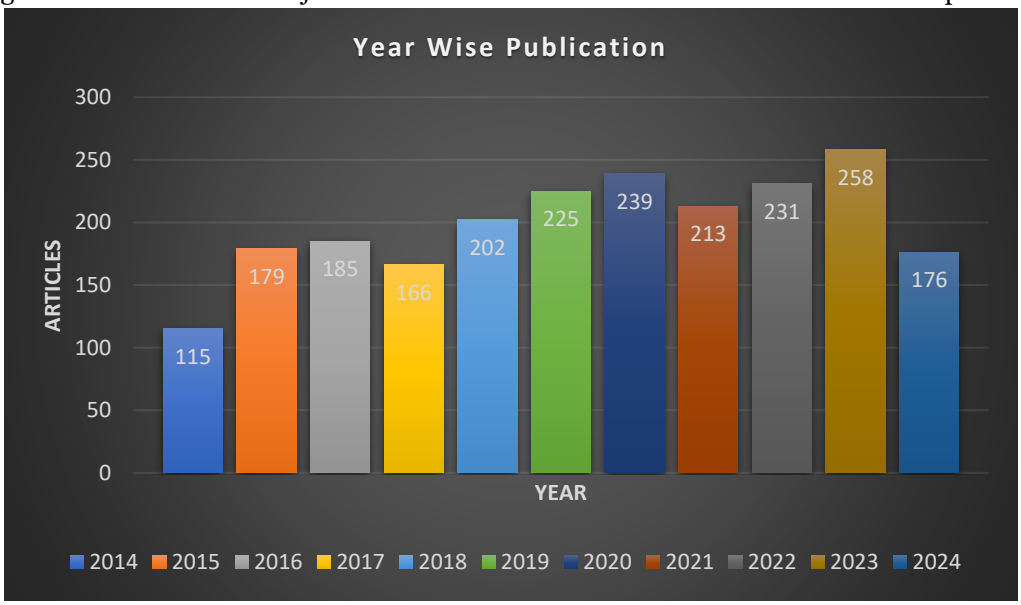

Figure 1: Educational leadership and vocational education documents articles

(Source: Scopus database, 2014 –2024 and authors' compilation)

Based on the quantity of articles authored, the second study inquiry sought to determine which authors were the most prolific. The top ten authors are ranked in Table 3. With 13 papers, Nurtanto, Muhammad appears to be the most productive.

Table 3: Top 10 prolific authors

(Source: Scopus database, 2014–2024; authors' compilation)

Sr. No.	Author	Documents	Citations
1	Nurtanto, Muhammad	13	180
2	Rosvall, Per-Ake	12	257
3	Nylund, Mattias	10	243
4	Cattaneo, Alberto	9	103
5	Tran, Ly Thi	9	361
6	Kholifah, Nur	8	133
7	Pilz, Matthias	8	132
8	Ledman, Kristina	6	113
9	Schumann, Stephan	6	58
10	Sevilla, María Paola	6	53

Nearly behind, Rosvall, Per-Ake, ranks second with 12 articles, and Nylund, Mattias, ranks third with 10 articles. With an astounding total of 361, Tran, Ly Thi is particularly noteworthy as the top leader in citations. Moreover, table 3 provides an important detail about the order of the top ten authors, who together have authored 87 publications.

There is total 5791 authors, in order to improve the accuracy of the analysis; minimum number of document author having are custom selected 5 and minimum number of citations author having selected 30. Only 23 authors meet the criteria. The 23 authors are divided into 3 clusters, as seen in Figure 2. 15 authors are in the red cluster, five in the green cluster, and three in the blue cluster. The writers' national and academic backgrounds show not only a high degree of international cooperation but also a rise in interest in this subject globally.

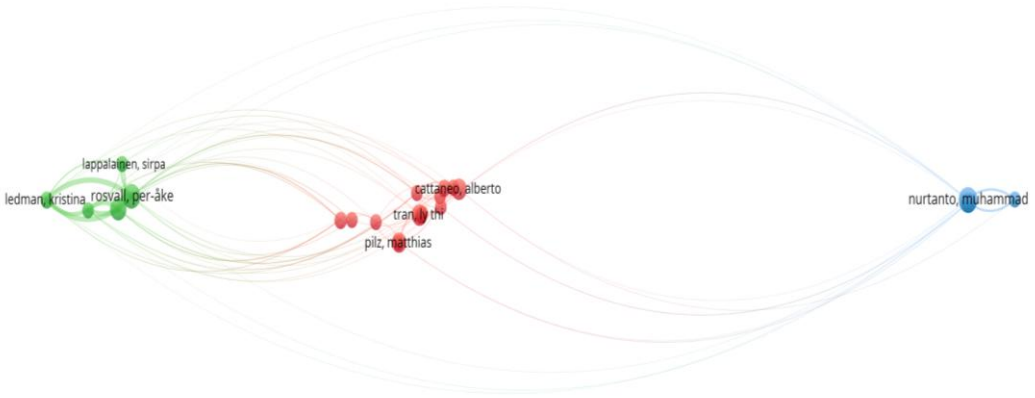

Figure 2. Authors network

(Source: Scopus database, 2014 –2024 and authors' compilation)

Regarding the quantity of articles published, the third study question examined which journals are more prolific. "Sustainability (Switzerland)," "BMC Medical Education," and "Journal of Vocational Education and Training" are the most prominent sources, according to major factors that influence scientific journals.

Table 4. The ten most prolific sources by article count
(Source: Scopus database, 2014 –2024 and authors' compilation)

Sr. No.	Source	Documents	Citations
1	Sustainability (Switzerland)	62	417
2	BMC Medical Education	47	680
3	Journal Of Vocational Education and Training	40	520
4	Nurse Education Today	34	517
5	Vocations And Learning	34	392
6	Educational Administration Quarterly	31	770
7	Educational Management Administration and Leadership	29	725
8	International Journal of Training Research	29	116
9	International Journal of Educational Development	25	392
10	Frontiers In Education	24	77

These three sources have made a significant impact on the subject of "educational leadership and vocational education" research. "Educational Management Administration and Leadership" and "Educational Administration Quarterly" received 725 and 770 citations, respectively, according to the citation count. Table 4 above lists the top 10 journals where research on vocational education and educational leadership has been published. The articles are scattered among as many sources as possible, with a focus on the special function that educational leadership plays in educational management and on the role that it plays in vocational education.

The fourth inquiry focused on the nations with the highest levels of productivity. The table 5 shows the number of documents and citations from top ten countries. The "United States" contributes the most with 500 documents and 6884 citations and this is a clear show of its dominance in the academic/research production. The "United Kingdom" and "Australia" rank next with 236 and 207 documents respectively, and citation of 2,680 and 3,155 revealing the dominance of both countries in research. The moderate contributions include "Germany" with 111 documents and 1,054 citations, "China" with 120 documents and 1,056 citations and the "Netherlands" with 131 documents and 2,399 citations.

The countries that have produced fewer documents and citations are "Indonesia, Canada, Sweden, and Finland"; the "Indonesia" has published 98 documents; however, they have received fewer citations than the other countries which demonstrate that their research has little global influence. This data reveals the difference in research contribution and impact in these countries. Table 5 illustrates the top 10 most productive nations based on the number of documents published.

Table 5. Top 10 Most Productive Nations

(Source: Scopus database, 2014 –2024 and authors' compilation)

Sr. No.	Country	Documents	Citations
1	United States	500	6884
2	United Kingdom	236	2680
3	Australia	207	3155
4	Germany	131	1918
5	China	120	1056

6	Netherlands	111	1871
7	Indonesia	98	662
8	Canada	92	1991
9	Sweden	78	1182
10	Finland	63	811

There are total 129 nations who have produced the documents related to educational leadership and vocational education. To improve the accuracy of the analysis through VoS viewer minimum number of documents of a country are custom selected 5 and minimum number of citations selected 50. Only 47 nations meet the selected criteria. Figure 3, which displays a network clustering 47 nations into 5 groupings, shows the international collaboration network. One can get a helpful insight into the diversity of research activities worldwide from the network of collaboration between academic institutions that carry out this kind of research. Nine countries are in Cluster 3 (blue), nine in Cluster 4 (yellow), fifteen in Cluster 1 (red), ten in Cluster 2 (green), and four in Cluster 5 (purple).

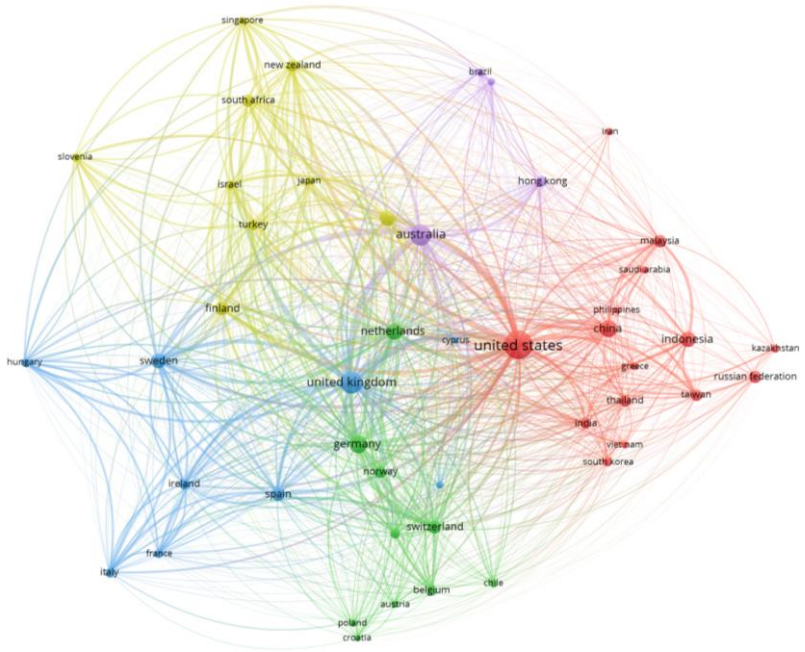

Figure 3. Nation's collaboration network
(Source: Scopus database, 2014 –2024 and authors' compilation)

Table 6 shows which university has been more active over the last 10 years in the areas of educational leadership and vocational education. A total of nine papers each were produced by the Swedish universities "The University of Gothenburg" and "Umea University". Other highly productive universities are "Monash University" in Australia and "The University of Glasgow" in the United Kingdom, with seven and six articles respectively. The ramifications of this new concept for education leadership are attracting the attention of researchers worldwide, as Table 6 also shows.

Table 6. Top 10 most prolific universities
(Source: Scopus database, 2014 –2024 and authors' compilation)

Sr. No.	Organization	Documents	Citations
1	"Department Of Applied Educational Science, Umeå University, Umeå, Sweden"	9	225
2	"Department Of Education and Special Education, University of Gothenburg, Gothenburg, Sweden"	9	235

3	"School Of Education, University of Glasgow, Glasgow, United Kingdom"	7	87
4	"Faculty Of Education, Monash University, Melbourne, Australia"	6	69
5	"Faculty Of Social Sciences, Tampere University, Tampere, Finland"	6	54
6	"School Of Education and Professional Studies, Griffith University, Brisbane, Australia"	6	26
7	"Cardiff University, Cardiff, United Kingdom"	5	21
8	"Department Of Education, Umeå University, Umeå, Sweden"	5	51
9	"Department Of Educational Studies, Karlstad University, Karlstad, Sweden"	5	57
10	"Iza, Bonn, Germany"	5	105

For the fifth research question, Table 7 shows the top 10 articles that have been cited in the field of educational leadership and vocational education. The article written by Goldie J got a maximum of 290 citations, followed by the article written by Cheng A with 289 citations. Other article's citations range from 284-139 respectively [37], [38], [39], [40], [41], [42], [43], [44], [45], [46].

Table 7. The ten most cited articles
(Source: Scopus database, 2014 –2024 and authors' compilation)

Sr. No.	Author and Journal	Total Citations
1	Goldie Jgs, 2016, Med Teach	290
2	Cheng A, 2014, Med Educ	289
3	Hanushek Ea, 2017, J Hum Resour	284
4	Hess Jl, 2018, Sci Eng Ethics	199
5	Olson R, 2014, Med Educ	194
6	Tran Lt, 2016, Br J Sociol Educ	171
7	Thistlethwaite Je, 2014, Acad Med	159
8	Modell H, 2015, Adv Physiol Educ	144
9	Chuang H-H, 2018, Br J Educ Technol	139
10	Van Vliet Ea, 2015, Cbe Life Sci Educ	139

The author's most used keywords were found by answering the sixth research question. In a study on vocational education and educational leadership, Figure 4 shows the most commonly used "author keywords". The "co-occurrence" of author keywords is shown in Figure 4. There were a total of 5729 authors' keywords, to increase the accuracy of analysis the minimum number of occurrences of keywords was selected as 10; then only 78 keywords met the threshold. The most occurred keyword is "vocational education" with a total of 827 occurrences, "educational leadership" ranks 2nd with 527 occurrences, "higher education" ranks 3rd with 89 occurrences, "vocational education and training" ranks 4th with 45 occurrences and "professional education" ranks 5th with 37 occurrences.

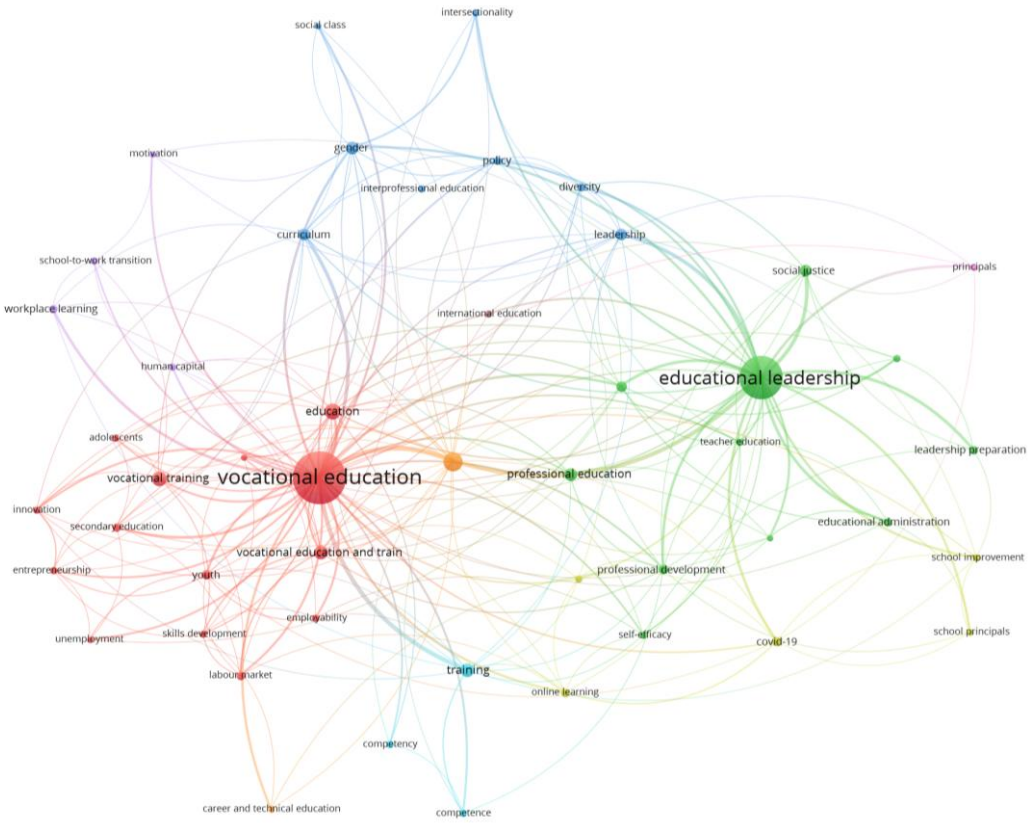

Figure 4. Most frequently used authors' keywords
(Source: Scopus database, 2014 –2024 and authors' compilation)

DISCUSSION

The study found that there has been increasing publication of articles on educational leadership in vocational education especially in the period between 2014 and 2024. The most expansion took place in the last three years, which shows that this area is being developed more actively. The sum of the articles collected is 2089 with the peak in 2023, which proves the significance of this field for modern research. The study also revealed some of the leading authors with "Nurtanto Muhammad" being the most productive author with thirteen published articles. Other contributors who made the list of authors include "Rosvall Per-Ake and Nylund Mattias" who were also awarded for their efforts. This shows how these persons contributed in development of vocational education research. Through the analysis it was determined that the journal "Sustainability (Switzerland)" was found to publish articles on educational leadership and vocational education.

Other journals such as "BMC Medical Education" and "Journal of Vocational Education and Training" also featured significantly, thus pointing to the fact that many different types of journals are currently publishing knowledge in this field. The "United States" claimed the highest level of publications as well as citations, while the United Kingdom and Australia closely ranked behind. This further show that this field is not limited to any particular country rather many universities from across the globe are actively involved and contributing towards the development of this field of knowledge. For instance, two of the most productive universities that were established in this study were the "University of Gothenburg and Umea University" both from Sweden. Article written by Goldie J in 2016 is the most cited article in the present list having 290 citations which reveals the importance of the article. The most used tags were "vocational education" and "educational leadership", which pinpoint the concern areas in the research domain. These keywords also point to a rising importance of leadership in vocational education across the world.

CONCLUSION AND LIMITATIONS

This bibliometric analysis reveals the evolution and distribution of primary indicators in vocational education and educational leadership. It aims to define the importance and evolutionary path of educational leadership in vocational education. This study uses the Scopus database to analyze the bibliometric landscape of research contributions on vocational education and educational leadership from 2014 to 2024. It examines factors such as “article frequency distribution, prolific researchers, influential articles, journals, and countries, co-occurrence of keywords, common author keywords, and coupling networks between authors, universities, and nations”.

The analysis reveals the “United States” has the most empirical and conceptual studies on educational leadership and vocational education, with disparities in research distribution across participating nations. The importance of recognizing individual teacher leadership in education is highlighted by the significant interest from many countries and prestigious universities. With a total of 258 publications, 2023 proved to be the most productive year. Muhammad Nurtanto was the most prolific author with 13 documents. According to the number of articles, “sustainability (Switzerland)” emerged as the most important source. The two universities with the greatest affiliations were "The University of Gothenburg" and "Umea University," both located in Sweden, and both have produced nine publications. “Vocational education” and “educational leadership” were the most often occurring keywords, with a total of 827 and 527 occurrences, respectively.

When talking about the study's limitations, it's critical to note that this research only used the “Scopus database”, which could have resulted in the exclusion of relevant works that were indexed in other databases (such as WoS, etc.). Subsequent investigations could potentially improve the relevance of the results by incorporating a wider range of publications and a more extensive collection of keywords. Terms like "teacher training, educational management, and educational efficiency" are a few examples of these that could be included, although they are not the only ones.

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