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MAPPING THE LANDSCAPE OF INNOVATIVE LEADERSHIP RESEARCH: A BIBLIOMETRIC ANALYSIS

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ABSTRACT

In today's rapidly globalising world, innovative leadership is crucial for organisations, including educational institutions, to address complex challenges. While the benefits of innovative leadership are well documented, research in the educational sector remains limited. This study analyses the current state and trends of innovative leadership research in educational contexts. We conducted a bibliometric analysis of 785 Scopus-indexed articles up to August 7, 2023. The study summarises research productivity, key sources, publication distribution by country, leading institutions, prolific authors, and citation patterns. Findings reveal a significant increase in innovative leadership literature from 1967 to 2022, with contributions from 159 authors across 82 countries and 160 institutions. This study offers valuable insights into the evolution and current state of innovative leadership research, despite its limitation to Scopus-indexed articles. The findings have important implications for researchers and practitioners in educational leadership, potentially guiding future research and informing leadership practices in educational institutions. This comprehensive overview contributes to a better understanding of innovative leadership in education and highlights areas for further investigation.

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INTRODUCTION

Leadership has long been recognised as a critical factor in the success and effectiveness of organisations (Yukl, 2013; Northouse, 2021). Traditional leadership theories such as transformational leadership (Bass, 1985), situational leadership (Hersey, 2014) and adaptive leadership (Heifetz et al., 2009) have provided valuable frameworks for understanding leadership dynamics. However, in the rapidly evolving 21st-century landscape, characterised by technological advancements, globalisation, and unprecedented challenges, there is an increasing need for leadership approaches that can foster innovation and adaptability (Mumford et al., 2002; Uhl-Bien et al., 2007). This context has given rise to the concept of innovative leadership, which builds upon and extends traditional leadership paradigms to meet the demands of the contemporary era.

The success of an organisation heavily depends on the leadership of its leaders (Dinh et al., 2014). A leader has the ability to bring about change in the organisation by using their power and authority (Muhammad Faizal A. Ghani & Crow, 2017; Kotter, 2012). These leaders are capable of fostering innovation in various aspects of the organisations they lead (Mohd Izham Mohd Hamzah et al., 2016; Rosing et al., 2011). While previous studies have investigated various aspects of educational leadership, there is a lack of focus on innovative leadership, which is increasingly important in this rapidly changing digital era (Schepers et al., 2005).

Innovative leadership is a multidimensional approach that integrates creative thinking, controlled risk-taking, and the implementation of new ideas to address current and future challenges (Horth & Buchner, 2014; Vlok, 2012). In the context of education, innovative leadership involves fostering a culture of continuous learning, encouraging experimentation, and leveraging technological advancements to enhance teaching and learning processes (Fullan, 2011; Hargreaves & Shirley, 2012).

The importance of innovative leadership in education is increasing due to the need for educational institutions to prepare students for an increasingly complex and uncertain future (Wagner, 2012). This requires a shift from traditional and hierarchical leadership models to more dynamic and adaptive approaches. Although relevant in the current era of challenges and changes, research on innovative leadership remains limited. Lokman Mohd Tahir (2015) shows that school leaders need to demonstrate innovative leadership when facing challenges and changes in educational institutions. Nurhairi Mohd Noor and Mohamed Yusoff Mohd Nor (2019) emphasise that innovative leadership in educational environments requires leaders who can combine continuous learning, creativity, interpersonal skills, understanding of the external environment, and commitment to innovation to lead change and drive school excellence.

While extensive research has been conducted on various aspects of educational leadership, there is a significant gap in studies specifically focussing on innovative leadership in the educational context, especially in Malaysia (Harris & Jones, 2015; Hallinger & Chen, 2015; Norhisham Shamsudin et al., 2023). This gap is significant, given the increasing importance of innovation in addressing the complex challenges faced by educational institutions in the digital era. Limited research on innovative leadership among school leaders in Malaysia, as evidenced by the priority of studies in the private sector context. Mohd Asyikin Daud (2011) and Hafsah Abdul Aziz and Kalsom Ali (2022) emphasises the need for a comprehensive examination of this leadership approach in the field of education.

This paper presents a bibliometric analysis of Innovative Leadership by focusing on three main research questions (RQs):
RQ1: How has research on Innovative Leadership in Education been developed and disseminated?
RQ 2: What keywords have been covered in research on Innovative Leadership in Education?
RQ 3: Who are the major participants of Innovative Leadership in Education research, and how have they collaborated?

METHODOLOGY

Bibliometric analysis examines global research patterns in a specific field using academic publications from databases like Scopus or Web of Science (WoS). This method distinguishes between review papers and bibliometric analyses, both focusing on presenting findings on a particular subject. Our study reviewed literature on Innovative Leadership in Education to address research questions (RQs). The choice of database is crucial; popular options include WoS, Scopus, ERIC, Science Direct, and Emerald. (Cobo et al., 2011) found that Scopus covers about 84% of WoS content, while (Feng et al., 2017) noted Scopus offers broader coverage. (Cobo et al., 2011) highlighted Scopus's effectiveness in exporting metadata across disciplines. Thus, Scopus was selected for this study. We limited our analysis to articles published between 2016 and 2020, a period chosen for its sufficient number of publications (1,174 articles) for a comprehensive review. Scopus provides accurate citation searches and extensive coverage across various fields, excluding medicine and physical sciences (Hallinger & Kovačević, 2019) . Our search criteria included the keywords "Innovative Leadership" AND "Education" in titles, abstracts, and keywords, focusing on articles and journals.

We analyzed document languages, publication trends, keyword co-occurrences, and identified leading countries, institutions, and journals in Innovative Leadership in Education. This study aimed to understand research trends and collaborative alliances, providing insights for future research. Following modified PRISMA guidelines, Moher et al. (2010) and Rahimah Zakaria et al. (2021) we used the search query "Innovative Leadership" AND "Education" in Scopus, yielding 985 documents. After screening for relevance, these documents formed our final database. We used various methodologies to analyze the data, including Scopus's search result analysis, manual data entry into Excel, and citation metrics via Harzing's Publish and Perish software. VOSviewer was used to visualize bibliometric networks (Aidi Ahmi & Mohd Herry Mohd Nasir, 2019). This paper aims to provide valuable insights into publication trends on Innovative Leadership in Education.

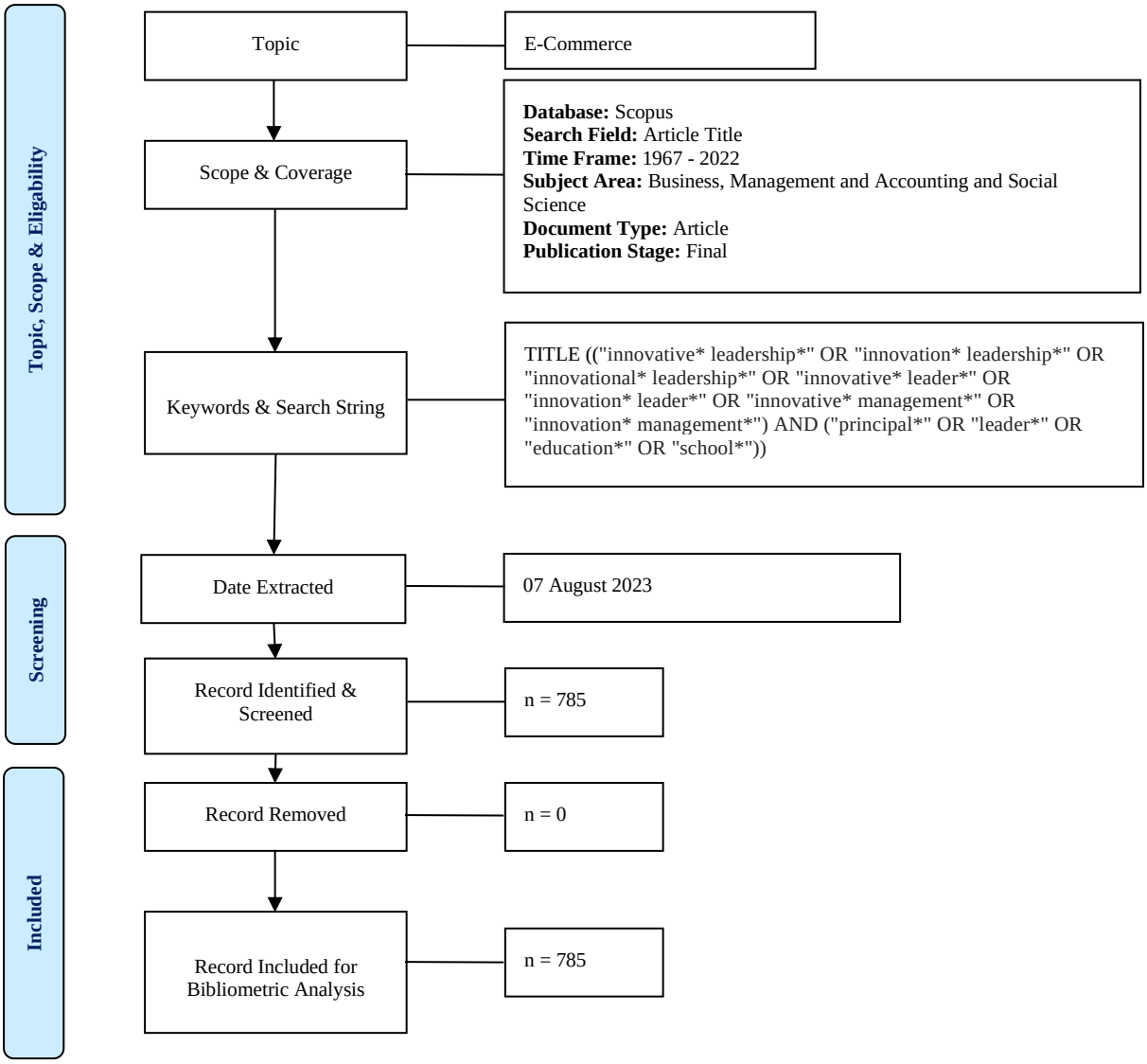

Figure 1: Flow diagram of the searching strategy.

RESEARCH FINDINGS AND DISCUSSIONS

We conducted an analysis of bibliometric attributes using Scopus data. These attributes include research productivity, the most active source title, the distribution of publications by countries, the most active universities, the most productive authors, and citation analyses. The document selection has been refined based on the publication year (1967-2022), subject area (Innovative Leadership in Education), document type (article), and source type (journal). Most of the results are presented in frequency and percentage format, with the co-occurrence of author keywords visualised using VOSviewer. The data analysis was segmented based on the RQs.

RQ1: How has research on Innovative Leadership in Education been developed and disseminated?

The primary RQ of this study seeks to examine the development and dissemination of Innovative Leadership in Education studies by analyzing (a) publications according to language and (b) research productivity.

Publications by Languages

Table 1 shows that of the 790 articles pertaining to research on innovative leadership in education, 91.39% were written in English. With 3.05 percent of the total, Spanish was the second most used language in publications. Russian (1.90%), Portuguese (1.27%), German (0.63%), Chinese (0.63%), French (0.38%), Lithuanian (0.38%), Afrikaans (0.13%), and Hungarian (0.13%) were the next most popular languages. All scientific fields recognize English as their official common language (Bornmann et al., 2012), which typically makes papers published in English easier to find in scientific community journals. Studies further support this by demonstrating that English constitutes a significant portion of academic publications across various fields, thereby enhancing global visibility and dissemination (Haba-Osca et al., 2019; Bazanova, 2016; Mohammad Mosiur Rahman et al., 2018).

Table 1. Type of languages.

Language	Total Publications (TP)*	Percentage (%)
English	722	91.39
Spanish	24	3.04
Russian	15	1.90
Portuguese	10	1.27
German	6	0.76
Chinese	5	0.63
French	3	0.38
Lithuanian	3	0.38
Afrikaans	1	0.13
Hungarian	1	0.13
Total	790	100.00

Productivity in Research

This subsequent analysis assesses research productivity by quantifying the number of publications produced each year. Analyzing articles based on their publication year enables researchers to discern patterns and ascertain the significance of research topics as they evolve over time (Aidi Ahmi & Rosli Mohamad, 2019). Figure 2 illustrates a steady yearly growth in the number of publications, culminating in 2022 with a notable emphasis on innovative leadership. Studies confirm a consistent rise in research outputs, particularly in leadership and innovation fields, reflecting increased academic focus on these areas over the years (Sikandar & Kohar, 2021). We anticipate that this positive trend will persist, as indicated by similar growth trends in leadership-related research (Cancino et al., 2017). Over time, the annual count of referenced publications on Innovative Leadership has consistently increased. In 1998, the total number of cited publications reached its peak at 2,329. Figure 2 provides a thorough overview of groundbreaking leadership publications from 1967 to 2022, organized by year. The abundance of publications on innovative leadership indicates that it is a topic of great contention among scholars, with surges in specific years often reflecting significant academic interest in the field (Murtaza Ashiq et al., 2023).

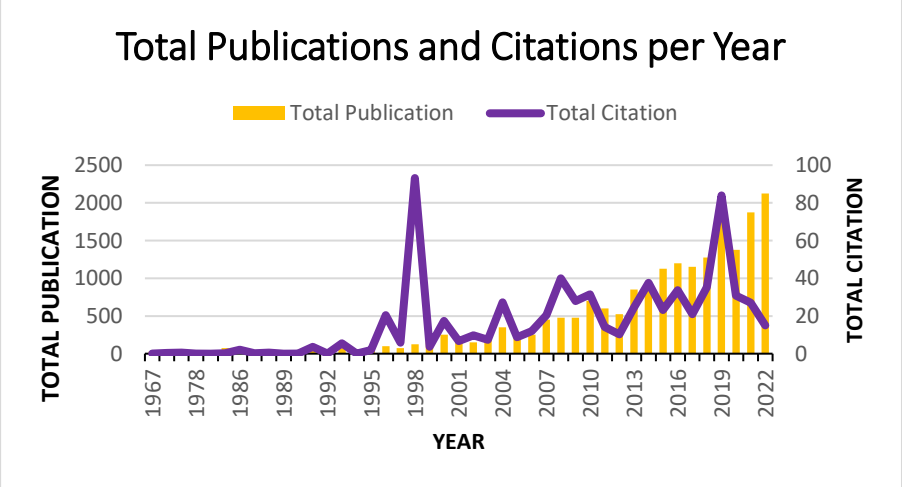

Figure 2. Total Publications and Citations per Year

RQ 2: What keywords have been covered in research on Innovative Leadership in Education?

The second RQ of this study aimed to determine the primary keywords and conduct a co-occurrence analysis. To address RQ2, we employed a methodology that involved analysing the citation network of 785 articles using top keywords and co-occurrence analysis. Keyword co-occurrence analysis is a robust content analysis method used to assess the level of correlation between keywords in the literature (Shmagun et al., 2020). In order to answer RQ2, this study determined the keywords that are most commonly utilised by scholars in the field of Innovative Leadership in Education research. The keywords extracted from the 785 studies on Innovative Leadership in Education are succinctly summarised and displayed in Table 2. The term 'Innovation,' which accounted for 24.59% of all keywords, emerged as the most commonly utilised keyword in the literature on Innovative Leadership in Education. Innovation Management (18.34%) is the second most commonly utilised keyword. This finding is rational since Innovation Management is a part of Innovative Leadership.

Table 2. Top 10 Keywords

Author Keywords	Total Publications (TP)	Percentage (%)
Innovation	193	24.59%
Innovation Management	144	18.34%
Leadership	92	11.72%
Innovation Leadership	31	3.95%
Education	24	3.06%
Higher Education	24	3.06%
Management	23	2.93%
Project Management	22	2.80%
Knowledge Management	21	2.68%
Research And Development	20	2.55%

In addition, the author's keywords have been organised and analysed using VOSviewer. (Baker et al., 2020) suggested that keyword co-occurrence happens when two keywords appear in the same article, implying a relationship between the two concepts. The relationships between the keywords were indicated by manipulating the size of the circles, the font size, the colour, and the thickness of the connecting lines (Sweileh et al., 2017). Keyword co-occurrence refers to the occurrence of two keywords simultaneously in an article, indicating a connection between the two concepts (Baker et al., 2020). Figure 3 depicts a network visualisation of the author keywords, each appearing at least six times.

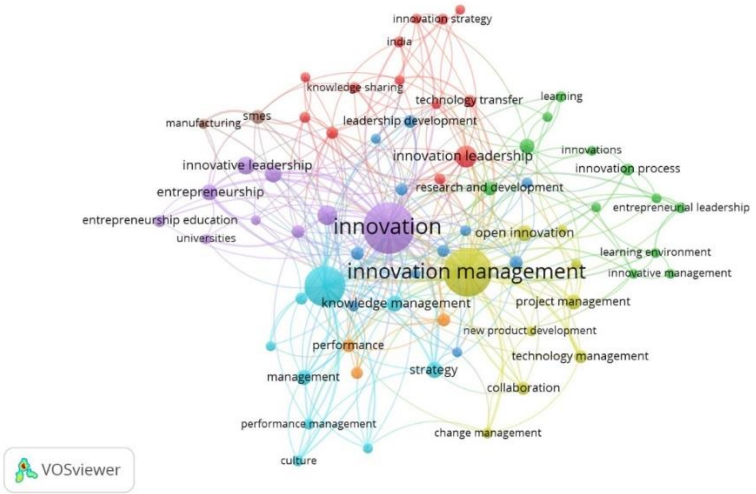

Figure 3: Author keywords network visualisation map with at least six occurrences.

RQ 3: Who are the major participants of Innovative Leadership in Education research, and how have they collaborated?

This study aimed to examine the attributes of scientific collaborations in research on Innovative Leadership in Education. This was achieved by analysing (a) the countries that made the greatest contributions to publications, (b) the most influential affiliations, (c) the most active journal, (d) citation analysis, (e) analysis of the most productive authors, and (f) authorship analysis.

Top Countries Contribute to the Publication

This article evaluates the number of publications from different countries affiliated with the author's institution. Table 4 presents the top ten countries that actively contributed to Innovative Leadership in Education from 1967 to 2022. The United States is the leading producer of publications. Accordingly, 540 represent 51.53% of all publications on Innovative Leadership in Education. The remaining distribution of authors' national affiliations consisted of fewer than 100 publications, specifically from the United Kingdom, Russian Federation, China, Germany, Australia, Spain, Canada, Italy, and Sweden. Evidently, research on Innovative Leadership in Education holds a significant position across different geographical areas. Figure 4 illustrates the geographic distribution of publications in the top countries.

Table 3. Top 10 Countries' contribution in terms of publication.

Country	TP	NCP	TC	C/P	C/CP	*h*	*g*
United States	160	20.38%	5791	36.19	39.94	37	74
United Kingdom	54	6.88%	3471	64.28	68.06	22	51
Russian Federation	49	6.24%	248	5.06	6.36	9	13
China	34	4.33%	1032	30.35	34.40	16	32
Germany	34	4.33%	1552	45.65	51.73	14	34
Australia	29	3.69%	770	26.55	27.50	14	27
Spain	29	3.69%	739	25.48	27.37	13	27
Canada	24	3.06%	679	28.29	30.86	10	24
Italy	24	3.06%	1408	58.67	58.67	12	24
Sweden	24	3.06%	940	39.17	42.73	13	24

Notes: TP = total number of publications; NCP = number of cited publications; TC = total citations; C/P = average citations per publication; C/CP = average citations per cited publication; h = h-index; and g = g-index.

Figure 4 illustrates a network visualisation map that displays the distribution of citations based on country. Based on the authors' affiliations, there were ten clusters identified by the co-occurrence of countries. The list comprises all countries that have contributed to a minimum of 24 publications. The size of a node represents the number of publications associated with a particular country.

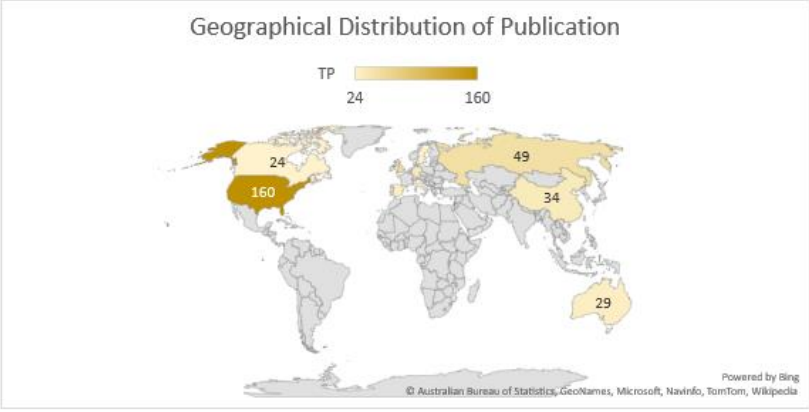

Figure 4: Geographical Distribution of Publication.

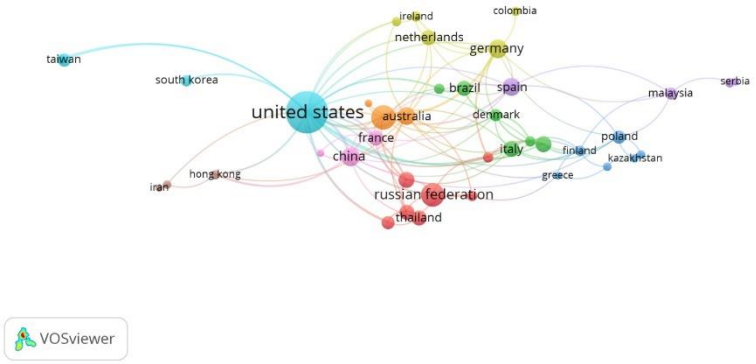

Figure 5. Network visualisation map of the citation by country.
Note: Smallest quantity of documents of an author = 5; Minimum number of citations of an author = 5.

The Greatest Influential Institutions

Table 4 lists the most influential institutions that have published at least eight articles on Innovative Leadership in Education. Kazan Federal University made the largest contribution to publications on Innovative Leadership in Education, with eight publications out of a total of 785 documents. The HSE University in the Russian Federation and King Mongkut's Institute of Technology Ladkrabang tied for second place, each with a total of seven publications. The Delft University of Technology ranked third, with a total of six publications. Four institutions, namely Texas A&M University, Aalborg University, Aarhus Universitet, and Warwick Business School, each had an equal number of five publications.

Table 4. Most influential institutions with at least eight publications.

Affiliation	**Country**	**TP**	**NCP**	**TC**	**C/P**	**C/CP**	***h***	***g***
Kazan Federal University	Russian Federation	8	6	50	6.25	8.33	2	6
HSE University	Russian Federation	7	6	50	7.14	8.33	4	6
King Mongkut's Institute of Technology Ladkrabang	Thailand	7	6	10	1.43	1.67	2	2
Delft University of Technology	Netherlands	6	6	127	21.17	21.17	5	6
Texas A&M University	USA	5	5	115	23.00	23.00	3	5
Aalborg University	Denmark	5	5	197	39.40	39.40	5	5
Aarhus Universitet	Denmark	5	5	14	2.80	2.80	2	3
Warwick Business School	England	5	5	455	91.00	91.00	5	5

Notes: TP = total number of publications; NCP = number of cited publications; TC = total citations; C/P = average citations per publication; C/CP = average citations per cited publication; h = h-index; and g = g-index.

The Most Active Journal

Table 6 displays the journal with the highest level of activity in terms of Innovative Leadership, having published a minimum of eight journal articles. Emerald Publishing has established itself as a prominent publisher, making significant contributions to the field of Innovative Leadership through its 14 publications in the European Journal of Innovation Management spanning from 1967 to 2022. The journal with the second highest level of activity,

accumulating a total of 140 citations, was sourced from the Multidisciplinary Digital Publishing Institute (MDPI). Technological Forecasting and Social Change currently holds the highest CiteScore (CS) ranking despite not being listed as one of the top publications. Scopus has recently implemented a new scientometric indicator called CS. This indicator is used to measure the citation impact of journals and track their performance in terms of citation analysis. Previously, the Elsevier database had several metrics, such as Source Normalised Impact per Paper (SNIP) and Scimago Journal Rank (SJR), which were used to evaluate the quality of scientific publications (Zijlstra & McCullough, 2016). Notably, CiteScore (CS) can offer a more authentic understanding of citations compared to the Impact Factor (Khosravi & Menon, 2019).

Table 5. Most Active Journal.

Source Title	TP	TC	Publisher	Cite Score	SJR 2022	SNIP 2022
European Journal of Innovation Management	14	274	-	9.0	1.142	1.861
Sustainability Switzerland	13	140	Multidisciplinary Digital Publishing Institute (MDPI)	5.8	0.664	1.198
International Journal of Innovation Management	13	295	World Scientific	3.2	0.488	0.688
Technovation	12	686	Elsevier	12.3	2.410	3.428
Technological Forecasting and Social Change	12	599	Elsevier	17.2	2.644	3.008
Journal of Product Innovation Management	12	1639	Wiley-Blackwell	14.1	3.222	3.377
International Journal of Innovation Science	1	343	Emerald Publishing	5.6	0.708	1.127
Asian Journal of Technology Innovation	11	98	Taylor & Francis	3.1	0.457	0.794
Research Technology Management	10	177	Taylor & Francis	3.5	0.533	0.930
Espacios	8	8	-	-	-	-

Notes: TP = total number of publications; TC = total citations.

The Citation Analysis

Citation analysis is a systematic approach used to assess the quality and influence of research publications (Aristodemou & Tietze, 2018; Ding & Cronin, 2011; Haddow & Genoni, 2010; Karamustafaoğlu, 2009). Table 6 provides the citation metrics for the chosen documents as of August 7, 2023. Over the course of 55 years (1967-2022), there have been a total of 17,591 citations in science education publications. The citation metric was calculated using Harzing's Publish and Perish software. The software utilised a RIS-formatted file obtained from the Scopus database to display the original citation metrics.

Table 6. Citations Metrics.

Metrics	Data
Papers	785
Citations	17591
Years	56
Cites_Year	314.13
Cites_Paper	22.41
Cites_Author	9013.84
Papers_Author	412.46
Authors_Paper	2.5
h_index	61
g_index	113

The Authorship Analysis

Table 7 presents the 5 articles with the highest number of citations in the field of Innovative Leadership in Education. The article titled "Does Entrepreneurial Self-Efficacy Distinguish Entrepreneurs from Managers?" was published in 1998 and had the highest number of citations. This article received a total of 1,700 citations, averaging 68 citations per year. (Chen et al., 1998) were recognised as the most prolific authors in terms of the highest number of citations for articles on Innovative Leadership in Education.

Table 7. Top 5 Highly Cited Articles on Innovative Leadership in Education

No.	Authors	Title	Year	Cites	Cites per Year
1	C.C. Chen, P.G. Greene, A. Crick	Does entrepreneurial self-efficacy distinguish entrepreneurs from managers?	1998	1700	68
2	K.S.R. Warner, M. Wäger	Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal	2019	682	170.5
3	D. Buhalis	Strategic use of information technologies in the tourism industry	1998	583	23.32
4	R. Verganti	Design, meanings, and radical innovation: A metamodel and a research agenda	2008	475	31.67
5	V. Chiesa, P. Coughlan, C.A. Voss	Development of a technical innovation audit	1996	440	16.3

This study aims to perform a thorough bibliometric analysis of the research conducted on Innovative Leadership in Education between 1967 and 2022. This bibliometric analysis can assess the level of research productivity (Moed, 2002) and quantify the number of publications in a specific research domain. The data obtained from the bibliometric analysis can be utilised to evaluate the performance of a specific research field. Research organisations can benefit from implementing financial policies and conducting a thorough analysis of the inputs and outputs of scientific research. Moreover, the results of the bibliometric analysis can be utilised to elucidate the factors associated with the impact of studies in a particular field of study and to guide scholars toward conducting thorough and well-investigated studies (Akhavan et al., 2016). This research collects data from the Scopus database on publications associated with active engagement. By employing the specified search query, this analysis has uncovered a total of 785 documents from the designated database. The study on Innovative Leadership in Education, based on documents obtained from the Scopus database, reported that one publication (0.13% of the total) exhibited a consistent increase each year until 2022. Emerald Publishing is a leading publisher significantly contributing to active engagement publications. It has published 14 articles and received a total of 274 citations from 1967 to 2022.

Regarding the initial RQ, the analysis of the publication trend in Innovative Leadership in Education revealed that English emerged as the predominant language. The findings suggest that the journal's publications on this subject have consistently expanded and received widespread dissemination. The second response to the RQ focused on the main areas of discussion covered in this analysis. The most commonly utilised keyword in scholarly research on Innovative Leadership in Education was 'Innovation,' which accounted for 24.59% of the total. In addressing RQ3 of this study, the analysis documented the primary contributors to Innovative Leadership in Education Research and elucidated their collaborative efforts. The United States had the largest number of contributing authors. Kazan Federal University, located in the Russian Federation, is the institution most commonly associated with authors of Innovative Leadership in Education. They have a total of eight publications.

The study utilised the VOSviewer software to analyse the citation and co-authorship network, specifically focusing on the characteristics of scientific collaborations in the field of Innovative Leadership in Education research. The citation metrics were computed using Harzing's Publish or Perish software for a total of 17,591 citations reported over a span of fifty-six years (1967-2022) across 785 articles. This resulted in an average of

314 citations per year and 22 citations per article. (Chen et al., 1998) were recognised as the most prolific authors in terms of the highest number of citations on articles related to Innovative Leadership in Education. Their article was titled "Does Entrepreneurial Self-Efficacy Differentiate Entrepreneurs from Managers?"

Despite the distinctive attributes of bibliometric analysis, it is essential to acknowledge the limitations of the study in order to provide readers with a clear understanding. Primarily, this research is confined to utilising the Scopus database as the main source of documents. Despite Scopus being widely regarded as a highly inclusive repository for academic literature Aidi Ahmi and Rosli Mohamad (2019) and Sweileh et al. (2017) observing the additional valuable insights that can be derived when utilised in conjunction with other databases is intriguing. Potential future investigations could encompass supplementary databases such as WoS, Google Scholar, and Dimensions. Furthermore, in order to narrow down the extensive range of the Innovative Leadership concept, we only examined a subset of the pertinent literature using restricted search queries; otherwise, the time frame was predetermined. In addition, the process of mapping the keyword co-occurrence and co-authorship network has not been cross-validated with other methodologies. The results were obtained exclusively from the designated keywords, such as "innovative leadership," "innovation leadership," and "education," and were derived from the article's title, abstract, and keyword. The primary rationale for this is that most research that concentrates on a particular subject will solely incorporate the title, abstract, and keywords of the documents.

Consequently, a thorough process of filtering and cleaning is necessary prior to the analysis. The weaknesses of citation analysis also include the presence of unknown underlying factors that influence the citing of specific documents and self-citations. Therefore, it is advisable to consider the following recommendations for future research: (1) Utilise supplementary techniques such as bibliographic coupling and fractional counting to reinforce the findings through a triangulation process. (2) Duplicate the study using alternative databases such as WoS and Science Direct or a combination of databases to demonstrate a greater representation of publications. (3) Engage in further research and actively work towards reducing the educational disparity that may result from the advancement of Innovative Leadership in Education. This will enhance the attainment of educational goals worldwide among leaders in Innovative Leadership in Education. In addition, this study employs a bibliometric strategy and scientific approach to analyse previous literature trends, thereby expanding and enhancing existing findings on Innovative Leadership in Education.

CONCLUSION AND RECOMMENDATION

This study on Innovative Leadership in Education highlights the need for thorough data preparation and acknowledges the limitations of citation analysis. Future research should focus on triangulating findings, replicating the study with broader databases, and addressing educational gaps. Theoretically, this research contributes to developing conceptual models and identifying literature gaps in educational leadership. Practically, it informs policy-making, explores technology integration in leadership practices, and identifies best practices for educational institutions. These findings highlight the importance of ongoing research into innovative leadership in education, emphasizing its potential to drive positive change in global educational settings. By applying these insights, we can work toward a more innovative and effective education system for future generations.

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