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Mapping of Scientific Literatures on Remote Work Research: A Scientometric Evaluation

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Abstract

This paper endeavors to reach out to the publications and explore research movements in remote work for the period 1987–2023 published in scopus-listed journals. The retrieved data (total 447 publications) were investigated through scientometric tools, MS-Excel and VOSviewer software tool. The scholarly literatures were examined to fulfill objectives of this paper such as annual distribution of papers, Distribution of literatures regarding to Subjects, prominent countries, citation analysis, bibliographic coupling of sources etc.

According to scrutiny, the scholarly publications were published in the year 2022. The swift rise in remote work literatures from 2020 onwards due to COVID-19 pandemic situation. Social Sciences has the highest number of publications related to remote work. The largest number of papers with 61.74% published as articles. Followed by conference papers with

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21.92%. The most frequent keywords in remote work research output is remote work with 217 papers. The most contributed country is United States accounted for 115 literatures, 39% shares. Brazil has contributed 15 papers, or 5% of the total, which is the lowest in research output. Yang I. and others have received the most citations, with 173. The journals 'sustainability (switzerland), nature human behavior, journal of business research' were the highly cited sources, with 178, 173, and 157 citation counts.

Keywords: Scientometric Analysis, Remote Work, VOSviewer, Scientometric Parameters, Bibliographic Coupling, COVID-19.

1. Introduction

In the wake of the digital revolution and the changing landscape of the modern workforce, remote work has emerged as a significant and transformative trend. This change from traditional office-based employment to remote work arrangements has been accelerated by advancements in technology, changing attitudes toward work-life balance, and the global response to the COVID-19 pandemic(Popovici & Popovici, 2020). The pandemic provoked serious economic crises across the globe, and many countries suffered severe difficulties. The biggest obstacles have been experienced by the medical industry, the educational system, commercial operations, including networks of supply chains, and the hospitality and travel industries (Raj et al., 2023). As a result of COVID-19 circumstances, many countries and various fields were worried about crises and thinking about how to manage them. Consequently, work strategies were changed, and online work was facilitated in various fields with the help of ICT (Kita et al., 2022).

Remote Work is often referred to as Work from home, telework, e-working and flexible workplace because it allows employees to do work from anywhere using technology(Grant et al., 2019).

In the modern workplace, remote work has evolved into a vital organisational tool that promotes efficiency in an environment of rising global competition (Kowalski & Slebarska, 2022).

Remote work is not merely a trend but a fundamental shift in the way we approach employment and work in the 21st century. As technology continues to advance, and as

attitudes towards work-life balance evolve, remote work is likely to remain a prominent feature of the modern work landscape. While it offers numerous benefits, it also presents challenges that must be addressed. It is up to individuals, organizations, and policymakers to harness the potential of remote work while mitigating its drawbacks to create a future of work that is more adaptable, inclusive, and fulfilling for everyone(Olson, 1983).

Scientometric Analysis:

Scientometrics is akin to bibliometrics, representing an innovative interdisciplinary domain that combines science, technology, and information science. It utilizes a wide range of mathematical, statistical, and data mining methods to assess and gauge scientific data, thereby measuring and quantifying scientific knowledge (Zainab & Wani, 2019).

This research delves into the emergence of literature related to remote work, examines it using scientometric criteria, utilizes MS-Excel for analysis, and employs VosViewer for visual representation.

2. Literature Review

The study carried out the performance of research in big data field. The data collection regarding big data research from the scopus database for the decade i.e. 2010-2019. The collected data has been analysed using scientometric parameters and revealed that the highest publications regarding big data in the conference papers with 53.57% shares. Most of papers published under the subject ‘computer science’. The maximum scientific literatures in the year 2018 with 1768, 23.56%. Most contributed author was M. Pandey with 35 contribution of papers. Followed by N. Kumar with 22 publications (Kumar & Rahaman, 2019).

The author has conducted research on scientometric analysis in diabetic retinopathy. In this study, the records were collected from the ISI (institute for scientific information) from 1993 to 2013. The records were examined, and it was found that the annual growth rate was 6.46% in the said field. It has also been observed that 93 countries, 2771 institutions, and 547 journals were involved in research activities in the diabetic retinopathy field. The most prolific author was Klein R. with 133 scholarly publications. The highest number of articles came from ‘University Wisconsin’ with 168 scientific literatures(Ramin et al., 2015).

The study conducted the analysis and mapping on heavy metal pollution in river system using scientometric tools. A total 33414 data were gathered from web of science pertaining to the topic during 2010-2021. The Bibexcel, VOSviewer, Citespace and scientometric tools were applied for the data analysis and visualization. The analysis and visualisation were done in context of cluster analysis of keywords, centrality measures, collaboration of countries and institutes and co-citation analysis of Journal and author. The author Hakanson L. has been ranked first with 143 scholarly works, and the second-ranked author was Muller G. with 58 papers and a betweenness centrality of 0.12 in this research activity(Sharma & Kumari, 2023).

The study evaluated and revealed the research performance of occupational therapy using scientometric tools. The study has been conducted for twenty years. The USA generated the most literature with 9517 papers, and the average number of citations count for a single paper was 22.78. The most influential keyword 'occupational therapy' and journal was 'British Journal of Occupational Therapy' with 1307 articles and 13489 citations. 'American Journal of Occupational Therapy' was the next most cited journal, with 1259 publications and 27770 citations. The prolific author was Brown T., with 128 papers and a 27-h-index (Sau & Nayak, 2023).

3. Objectives of the Study

The main purpose of the study is to explore current research trends regarding remote work within the said period.

The following aspects will also be examined by scientometric parameters:

- To identify annual publications in remote work research.
- To find out scattering of scientific literatures in context of subjects.
- To determine keyword frequency in the field of remote work.
- To recognize most productive countries.
- To know the most prominent authors on basis of citations received.
- To assessed most influential sources in remote work research activity.

4. Methodology

The primary data has been collected from the scopus database from the year 1987 to 2023. According to scopus database, the first publication regarding remote work published in 1987. For the data collection, the search strategy TITLE ("Remote Work") was used in the scopus database. Total 454 scientific literatures related to remote work for the year 1987-2023 extracted in csv file from the scopus database on October 19th, 2023. The extracted data (454 literatures) has been observed and irrelevant data (7 literatures) was eliminated from the primary data. The final 447 scholarly publications of remote work research will be measured through scientometrics tools, MS-Excel and VOSviewer-mapping tool.

5. Scope and Coverage

Authors scrutinized scientific publications in context of remote work were only available in scopus database for the year 1987-2023.

6. Data Analysis and Interpretation

6.1 Annual Publications of remote work literatures:

Figure 1 shows the number of publications in remote work research over the years from 1978 to 2023. The number of publications has generally been low until the mid-2000s. There's a noticeable growth in the number of scholarly publications from 2020 onwards, with a significant spike in recent years 2022-2023. The Year 1987 also had a relatively high number of publications compared to the preceding years. The rapid increase in remote work publications from 2020 onwards could be influenced by the COVID-19 pandemic situation. The highest number of papers regarding remote work published in the year 2022 with 151 (33.78%) papers. Publications in 2023 year would be published in future days as 2023 currently ongoing year and many publications could be in publishing process. The year 2023 is still an active year and many publications may still be in the publishing process, therefore publications in this year could be released in the future.

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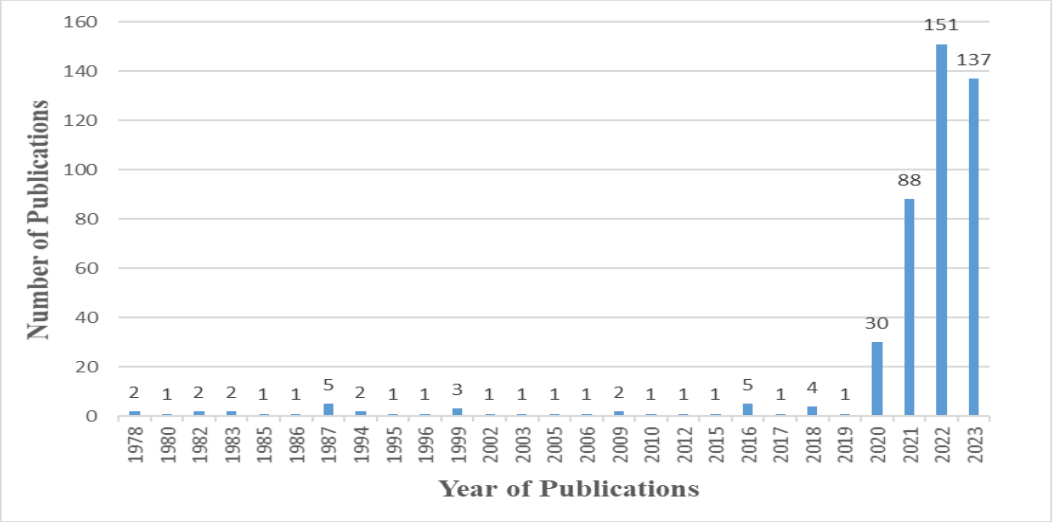

Figure 1: Annual Distribution of Publications

6.2 Distribution of Scholarly Publications in Context of Subjects:

Figure 2 represents the number of scholarly publications in the various subjects. The subject areas "Social Sciences" and "Business, Management, and Accounting" have the highest number of scientific papers, with 146(19.86%) and 142(19.32%) respectively. "Energy" has the lowest number of scientific literatures with 25. The overall data of the prominent subjects, along with the number of scientific publications, is represented in figure 2.

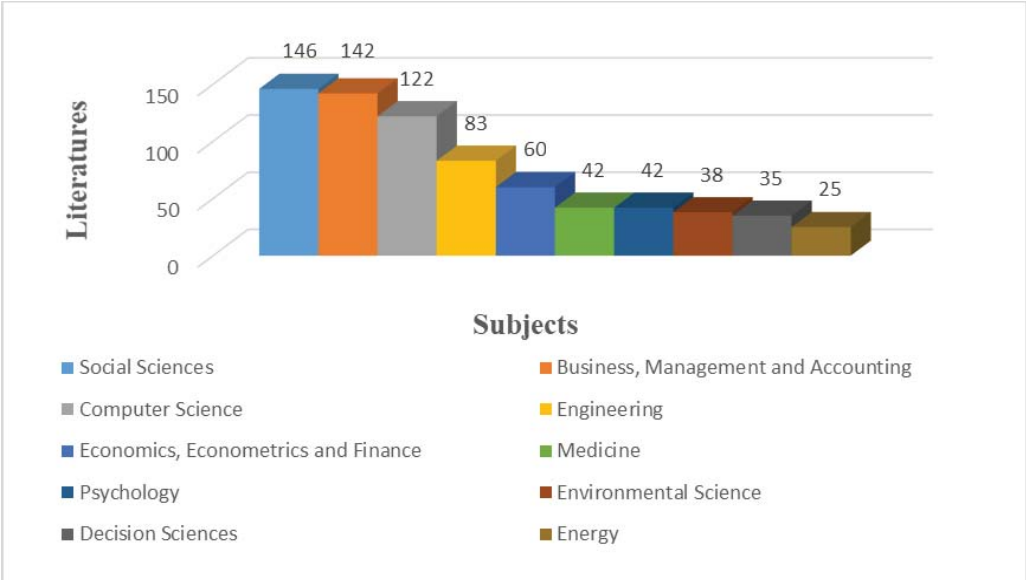

Figure 2: Subject wise Distribution of Publications

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6.3 Types of publications of Remote Work:

Figure 3 provides information on the distribution of documents by type of research publications. The highest number of research outputs with 276 papers, 61.74% shares published as journal article. Second most frequent document type is conference paper with the share 21.92%, followed by book chapter and review with 9.40%, 2.24% shares respectively.

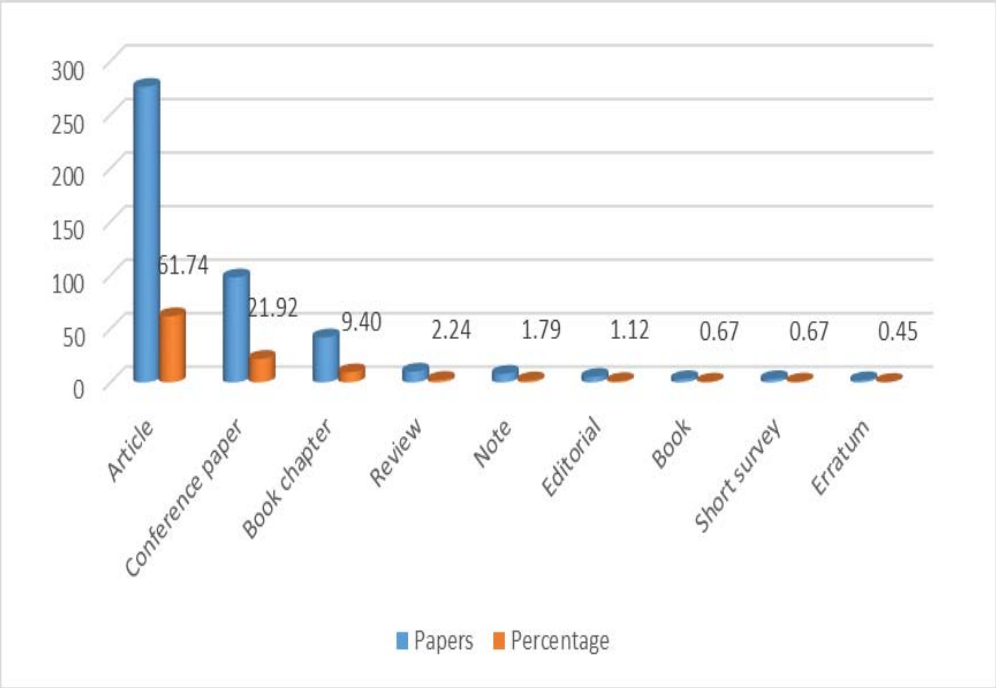

Figure 3: Types of Publications

6.4 Most Frequent Keywords in Remote Work Research Output:

The data analysis revealed the frequency of keywords in the remote work research activity. According to figure 4, the highest number of documents with 217 scholarly literatures published under the keyword 'remote work'. Followed by 'covid-19, Pandemic/Pandemics, Human/Humans, and telecommuting' with 134, 76, 76, and 36 respectively.

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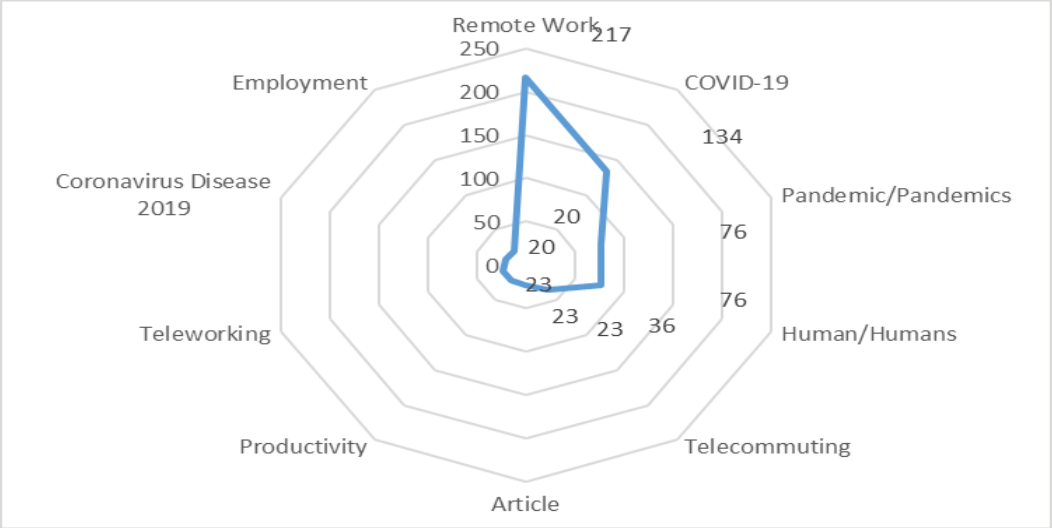

Figure 4: Most Frequency of Keywords in Remote Work Research

6.5 Most Prominent Countries:

The visualisation of figure 5 consists of information about the number of publications from various countries. Remote work research output came from the USA with 115 papers and 40.64% shares, which is the most significant contribution. Russian federation, Canada, Germany have also significant production in remote work research with shares 9.19%, 8.83%, 8.48% respectively.

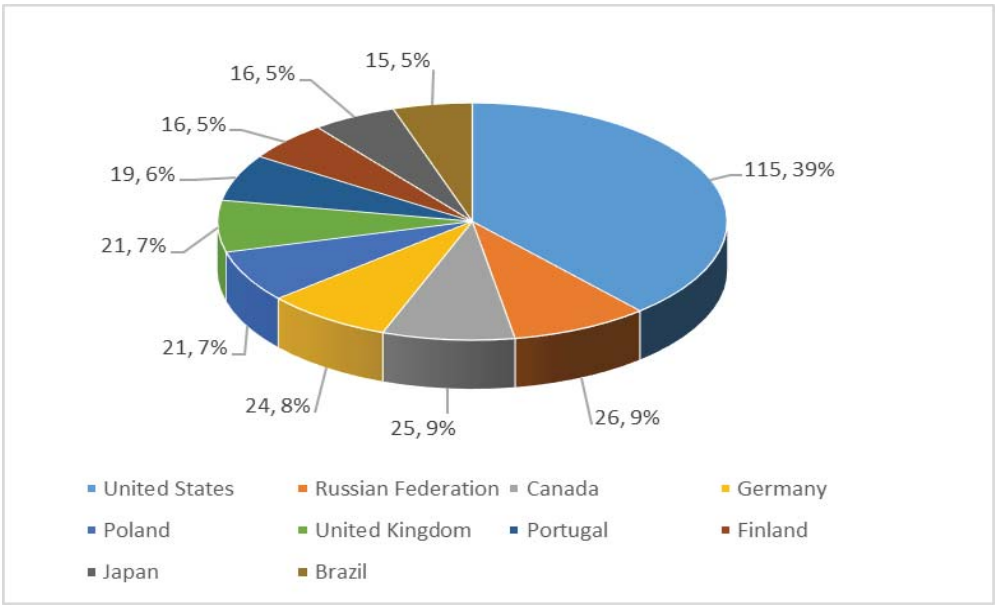

Figure 5: Most Prominent countries

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6.6 Citation Analysis in perspective of Authors:

The primary data of remote work papers run in VOSviewer visualization tool and set maximum number of authors per document - 10, minimum number of documents of an author - 2, minimum number of citations of an author - 1 then out of 437 authors, 12 authors met the thresholds.

Figure 6 highlights the authors who have received the greatest number of citations. The author Yang I. and others have received the most citations (173) for their documents. Followed by Toscano F., Zappals S. with 168 citations count, Gallacher G. and Hossain I. with 66 citations received.

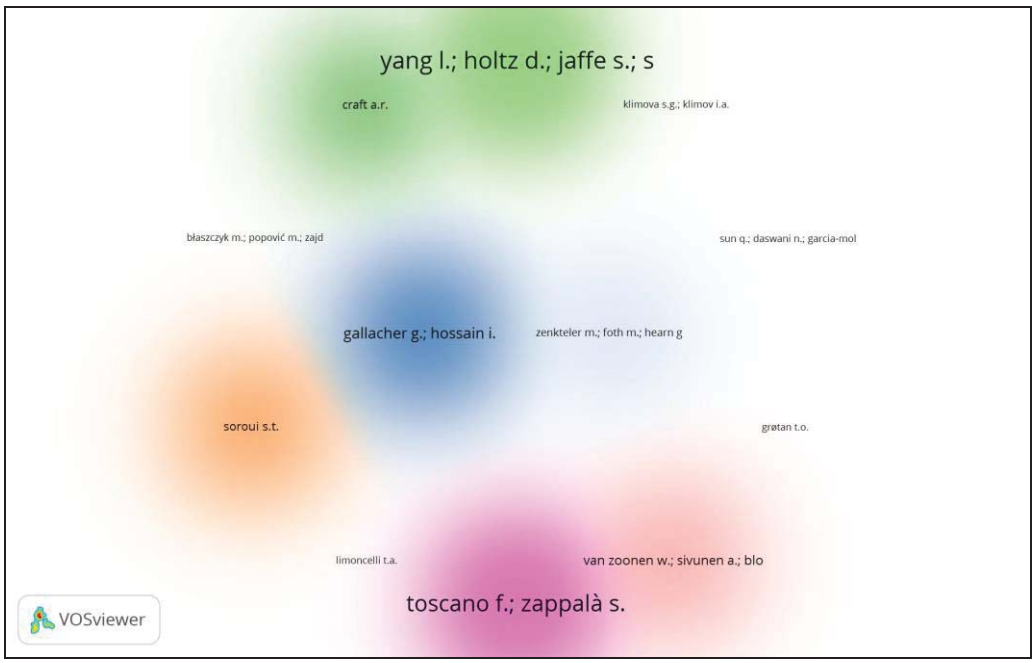

Figure 6: Citation Analysis in perspective of Authors

6.7 Bibliographic Coupling of the Sources:

Figure 7 exhibited the bibliographic coupling of the sources of remote work research. The data set in VOSviewer, the minimum number of documents of a source – 2, minimum number of citations od a source – 0, out of 344 sources the 54 sources met the thresholds. Some of them were not connected to each other; therefore, finally, 30 sources were received to visualize. The sources were selected by citation counts in VOSviewer. The journal 'Sustainability (Switzerland)' has acquired first rank with 178 citations and 73 total link

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strengths for 11 documents. 'Nature Human Behaviour' has 173 citations, 2 documents and 1 total link strength. Moreover, in Figure 7, larger circles represent sources with a higher citation count, and smaller circles represent sources with la lower citation counts.

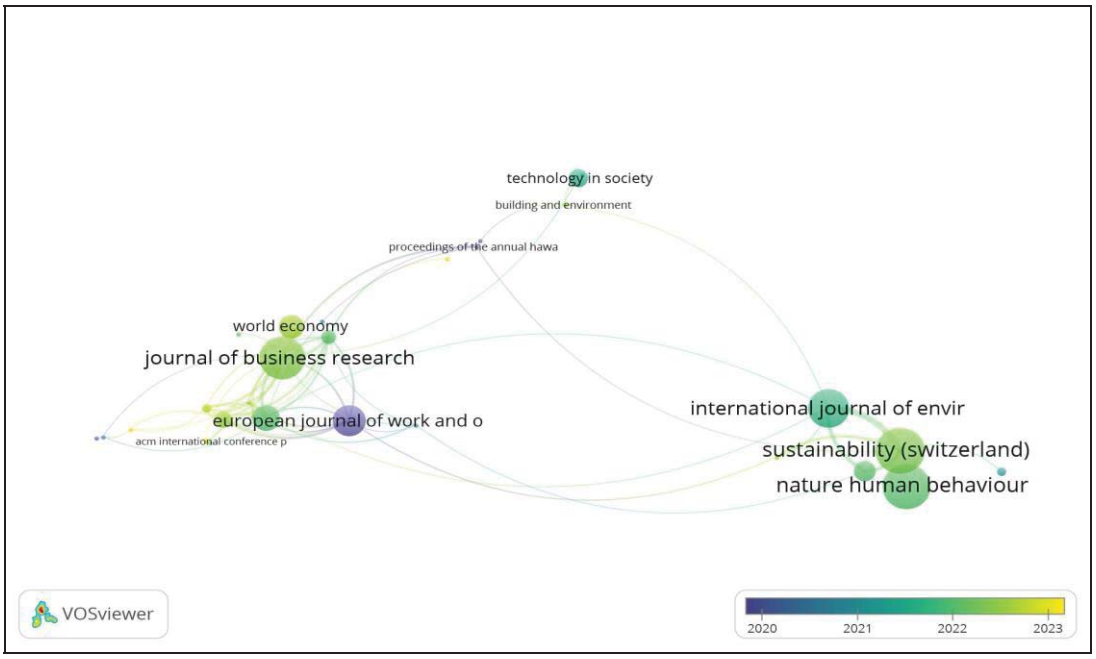

Figure 7: Bibliographic Coupling of the Sources

7. Key Findings

- The most effective form for scholarly communication and publication has been found as journal articles.
- The analysis emphasized the remarkable expansion in the year of 2022 with 151 scholarly publications.
- The most preferable subject parts were "Social Sciences" and "Business, Management, and Accounting" with 19.86% and 19.32%, respectively, for this research field.
- The 'remote work' and 'covid-19' were the most frequent keywords, with 134 and 76 occurrences in the research activity, respectively.
- The prominent country for the research performance was the USA, with a contribution of 40.64%.

- The analysis of the most productive authors was based on citation counts, and it was discovered that the author 'Yang I. and others' received 173 of the highest citations.

8. Conclusion

The present analysis concluded that there has been upward trend in the research development regarding remote work during the span 1987-2023. Our analysis additionally demonstrated that research activity regarding remote work has been increased from the Covid-19 pandemic around the world. The contributors Yang I., Holtz D., and Jaffe S. have received excellent scores in the context of citation counts. The most influential and most productive country was the USA, which ranked first in remote work research output.

This study presented the quantitative performance of scholarly publications of remote work using scientometric parameters. This can help to identify the most active research disciplines, leading sources, communication of keywords. Based on these factors, it is beneficial for researchers seeking to publish in this area as well as interested institutions to stay updated with emerging findings. Scientometric analysis in remote work research will be a valuable tool for researchers, decision-makers, and corporations as remote work becomes an increasingly significant characteristic of the modern work landscape. By keeping an eye on these future space fields, scientists can contribute to the developing body of knowledge in the field and stay ahead of emerging trends.

The authors have utilised the Scopus database for the primary data collection for this study. Future research in remote work endeavours may be expanded by harnessing primary data from prestigious databases such as IEEE Xplore, Springer Link, Dimensions, and Web of Science. These additional databases can be harnessed to uncover and analyse more invaluable quantitative research within the realm of remote work.

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