

A Bibliometric Mapping of Five Decades Research in Telecommuting

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Abstract

Globalization, new media development, and a chaotic job climate have transformed the nature of the workplace in the 21st century. Thus, understanding areas of concern and expanding collaborating networks are essential to progress scientific creation towards integrated efforts. This study aimed to map the global research trends in telecommuting publications, research areas, prolific sources, most cited documents, authors' co-authorship, institutions co-authorship, countries co-authorship, and keywords co-occurrence. Using the Scopus database, a total of 1453 telecommuting publications were disseminated between 1964 and 2020. The findings revealed that the number of publications fluctuated with hike in publications in 2020. It can be interpreted that telecommuting research is miscellaneous by evaluating research fields. About 44.80% of the overall worldwide publications have been contributed by scholars from the United States, leading 77 other countries. Also, among the most prolific sources, the Transportation Research Record was the topmost of the other 159 outlets. The undertaken bibliometric study offers a comprehensive and in-depth view of telecommuting research that may be useful to practitioners and researchers in advancing potential knowledge in this field.

Keywords Collaborating Network, Graphical Visualizations, Publication Trends, Scopus, Vosviewer, Telecommuting, Bibliometrics.

Introduction

Globalization, the advancement of digital technologies, and the stressful working environment have changed the 21st-century workplace essence. Serving as a telecommuter away from the office has been available to many workers worldwide, making mobile communications much cheaper (Ma, Hen & Chooi, 2019). New job agreements and telecommuting have evolved to create a work climate anytime and anywhere (Narayanan et al., 2017). Telecommuting opportunities are strengthened by home computing technologies that provide job accessibility, facilitate social interactions, allow product transactions, and make travel and online access more convenient and interchangeable (Lyons, 2015).

Since the advent of personal computers, notebooks, and cell phones in the 1980s, these devices' costs and sizes have plunged, increasing speed and bandwidth (Kizza, 2013). Telecommuting has also grown, and more people will work at home, using a computer and the internet to link in their careers (Picu & Dinu, 2016). Moreover, the transition from factories to a knowledge economy has expanded the number of telecommuting employees (Kizza, 2013). Telecommuting is defined as "a work practice that involves members of an organization substituting a portion of their typical work hours ... to work away from a central workplace-typically from home-using technology to interact with others as needed to conduct work tasks" (Allen, Golden & Shockley, 2015, p. 44). Its' use has been increasing, with more than 25 million in the United States (Gallup, 2017), and the growth rate is projected at 11% to 30% in many parts of the world (Tugend, 2014).

Advancing information and communication technology often improves daily work access. Employment remains an anchor for jobseekers, a constraint requiring non-discretionary travel within a focused duration around which all daily expedition is organized (Le Vine, Polak & Humprey, 2017). Furthermore, mobility is a core principle in transport planning to quantify time, expense, or distance penalties that bind individuals, goods, events, and opportunities dependent on open transport systems (Reggiani, Bucci & Russo, 2011). Academics and learning institutions emphasize that technology is dramatically changing how culture facilitates achievement and positivity, motivation and leadership (Caranto, Sergio & Oribiana, 2020).

The concept of space-time geography helps understand this phenomenon, as telecommuting decreases the spatial and temporal restrictions on the availability of a person to conduct activities at various locations within a specified timeline (Wang, Chen, Yuan, Wang, Lam & Li, 2018). Telecommuters have greater flexibility of when and where they perform work tasks and spend doing other activities; making them more available to be at different places during the day (Tavares, Santos, Diogo & Ratten, 2020). Indeed, research in China and the United States has concluded that telecommuters tend to travel more for other purposes and that demand for non-work activities will affect their preference for telecommuting (Loo & Wang, 2018).

Telecommuting is a broad term that encompasses various aspects of an employee's travel, activity, and attitude (Asgari & Jin, 2015). Additionally, Asgari and Jin (2015) asserted that telecommuting is not a single-level decision but a hierarchy of integrated decisions that take several long-term and short-term resolutions into account. Regardless of how telecommuting is defined or quantified, there appears to be widespread agreement on its benefits. Individuals employed with telecommuting organizations became more involved than non-telecommuting organizations (Belzunegui-Eraso & Erro-Garcés, 2020). Telecommuting was explicitly and indirectly connected to dedication by presumed target encouragement and task advancement (Ma et al., 2019). Individuals who have reached their personal goals should, nevertheless, retain high levels of engagement (Masuda, Holtschlag & Nicklin, 2017). Home-based telecommuting has been the most viable and profitable way for employees to deliver better jobs (Hornung & Glaser, 2009). Human resource practitioners are developing strategies to improve employees' health based on balancing work and life to encourage well-being and happiness and counter tiredness and burnout, leading to high turnover (Haladay, Sergio, Opuencia & Antiado, 2016). Knowing that managers can expand workers' lives without

losing organizational needs provides a new model. It would give staff and employers fair practices (Macasukit–gernal, Sergio & Al Shuali, 2013).

The fundamental purpose of the current research was to establish patterns in telecommuting-focused publications over the last 56 years (from 1964 to 2020). It is also to classify research areas, prolific sources, most cited documents, authors co-authorship analysis, institutions co-authorship analysis, countries co-authorship analysis, and keywords co-occurrence analysis on telecommuting. The information provided by this study is intended to provide a concise overview of the future of telecommuting research that will allow readers and researchers to obtain insight that benefits their studies. The approach to this bibliometric review could lead to substantial contributions to current telecommuting research.

Materials and Methods

A bibliometric analysis is a mechanistic approach to comprehending global research patterns based on an academic literature database (Sweileh, 2020). This kind of approach separates the bibliometric from the review paper, which was mainly projected to address the most recent development and possible directions of a topic discussed by the authors (Ellegaard & Wallin, 2015; Zupic & Čater, 2015).

Design of the study and database selection

A bibliometric analysis was conducted to analyze data related to telecommuting research's inclusion, use, or application. The data was based on the countries and languages of publications, the annual evolution of the number of publications, the most prominent journals and authors, and the key areas of research in which the publications are framed. Bibliometric analysis was conducted using several databases such as Web of Science (WoS), Scopus, and Google Scholar. The Scopus database was used in this study to retrieve data on telecommuting research. This is because the documents compiled in the Scopus database contained the most critical abstracts and citations in research. The database is also containing over 16,000 peer-reviewed journals, conference proceedings, trade papers, book series, and patents, offering the broadest possible scope for research, scholarly, medical, and social sciences (Khudzari, Kurian, Tartakovsky . & Raghavan, 2018; Sweileh et al., 2016).

Data collection

Bibliometric data was retrieved on December 5, 2020. The retrieved data was initiated by identifying precise keywords, appropriate information, and the specific objective of the study. The keyword “Telecommuting” based on TITLE-ABS-KEY and the quotation marks were used to generate precise search results. The result of retrieved data produces 1453 publications from 1964 to 2020. Out of 1453 publications, 944 were articles from various journal sources, 315 were conference papers, 76 were book series, 74 were books, and 44 were trade journals. A total of 1421 publications were written in English, 17 in French, and less than ten in other languages such as German, Spanish, Chinese, Persian, and Hungarian. Data in the form of Comma-separated Values (CSV) and Research Information Systems (RIS) such as years, authors, the field of study, article sources, countries, and languages were exported to Microsoft Excel, Publish or Perish (PoP), and VOSviewer software for further analysis.

Maps of network visualization created with Vosviewer

The extracted data set was mapped to show co-authorship in terms of authors, institutions, countries, and keyword co-occurrences. The free online program VOSviewer was used to map co-authorship and keyword co-occurrences (Van Eck & Waltman, 2010). The network visualization is the most basic display mode, depicting iterations of co-authorship and the formation of some clusters. The size of a node in the network visualization map is proportional to its frequency of occurrence (Abd Aziz, Abdullah & Samsudin, 2021). The map demonstrated that related terms exist in close proximity and share the same color by taking keyword co-occurrence into account. The terms with the most nodes have the most frequency. Each cluster of terms with the same color denotes a research topic or theme. As a result, the number of clusters corresponds to the number of research topics found in the retrieved documents.

Results

Publication trends

Figure 1 showed that within 56 years, a total of 1453 articles have been written. However, only 173 out of 1453 publications were considered open access, suggesting that most of these publications are not publicly accessible and the user needs to pay to access the information. Thus, it is recommended that articles be written in open access to gain more citations. The earliest publication was dated back to 1964, and no more record was found until 1976. The finding also suggests that intense interest in telecommuting research began in 1994 when more than 20 documents were found. In 1996, the publications rose by 57 and fluctuated until 2019. The number of publications soared exponentially by 180 in 2020, fourfold over 2019. This might be due to the global Covid-19 pandemic, which leads to an ongoing change to remote work in 2020 and is expected to continue in future research. In response to the Covid-19 pandemic, many companies have adopted telecommuting workers to ensure market stability and meet social distance needs. The effect of telecommuting on accessibility and family-work conflict is seen as a crucial issue for researchers and policy-makers (Lyttelton, Zang & Musick, 2020). Apart from the high infection risk of the virus, federal, state, and municipal authorities have closed schools and businesses and limited neighborhood meetings in most infected countries. Teleworking enhances perceived performance without flipping about and the expected workplace disruptions (Lincoln, Khan & Cai, 2020). Also, the number of researchers worldwide and the increased number of telecommuting research in the Scopus database have undoubtedly affected the number of publications. By witnessing the exponential growth observed in telecommuting research between 1994 and 2020, it can be construed that this research area is pertinent and reputable.

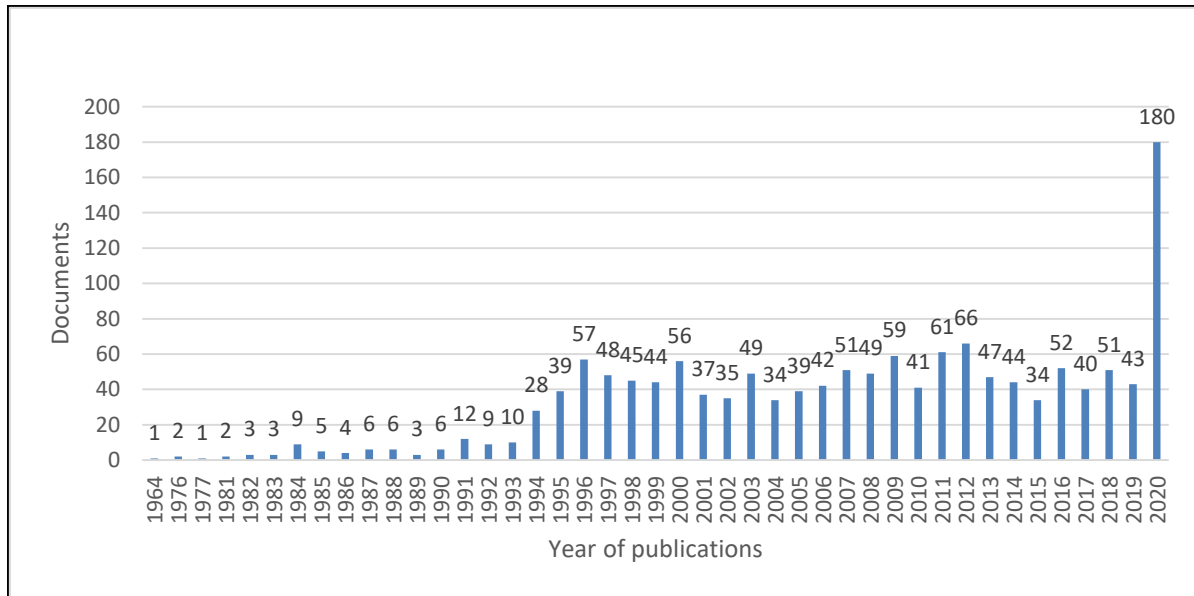


Figure 1: Publication trends in telecommuting research

Analysis of research areas

Telecommuting is vast, and several research groups worldwide are involved in these areas. As shown in Table 1, social science interests are the main focus in telecommuting research. This finding is expected as the subject under this review is relevant from social sciences perspective, where the focus was centered on the relationship between employees’ work-family issues, attitudes, and work outcomes, including job satisfaction, organizational commitment and identification, stress, performance, wages, withdrawal behaviors, and firm-level metrics. This aspect addresses related theoretical issues that could affect or change the effects of telecommuting, including the essence of the work done during telecommuting, organizational mechanisms such as information exchange and creativity, and external aspects that provide explanations for telecommuting, such as family responsibilities (Allen et al., 2015). Another field of study that stands out is Computer Science, with 430 publications, and Engineering, with 413 publications. The findings indicate that telecommuting and data sharing remains a central aspect of modern networks and internet access retrieval systems. In addition, engineering disciplines integrate theoretical principles into practice-oriented research, providing frameworks and methods for acquiring new skills. The current information system functions in an immersive online mode, enabling the user to communicate with the host from a varied remote location via a contact connection, unlike traditional systems (Arora, Kaur, Chandra & Bhatt, 2013; Tate, Lartey & Randall, 2019). Also, with the telecommuting environment continuously changing and the information technology industry improving, the use of electronic energy and computer technology will have something to expect in the coming years (Raji-Lawal, Adesina & Akerele, 2020).

Table 1

Research area in telecommuting with at least 100 publications

Rank	Subject Area	Publications
1	Social Sciences	503
2	Computer Science	430
3	Engineering	414
4	Business, Management and Accounting	345
5	Medicine	143
6	Environmental Science	124

Prolific sources

In order to identify the most influential source titles in telecommuting research, Table 2 presents a list of the ten source titles, which is ranked based on the number of publications. Considering the number of publications, Transportation Research Record seems to be the most influential source title in this field, with 40 publications. Other relevant sources are the New Technology Work and Employment in the second rank and Transportation at the third rank. Based on this finding, it is suggested that the publications have been contributing useful knowledge that will allow prospective researchers to refer to and be beneficial for their future telecommuting research. The information provided also indicates that telecommuting research has been widely published in various conferences and proceedings.

Table 2

The ten most influential source titles with at least ten publications

Source Titles	Publications
Transportation Research Record	40
New Technology Work and Employment	29
Transportation	19
Transportation Research Part A Policy and Practice	16
Lecture Notes in Computer Science	14
Proceedings of The ACM SIGCPR Conference	11
Environment and Planning A	10
Proceedings of The Annual Hawaii International Conference on System Sciences	10
Proceedings of The Hawaii International Conference on System Sciences	10
Technological Forecasting and Social Change	10

Most cited documents

The next step is to recognize the most active and successful authors in the field of telecommuting. A list of the five most-cited documents is provided in Table 3. Although several factors can affect the importance of a paper, the number of citations is generally seen as a fair representation of the popularity and influence of work among the scientific community (Merigó & Yang, 2017). As indicated in Table 3, the 1999 paper written by V. Venkatesh stands as the most cited publication of all times, with 849 citations for the article entitled "Creation of favorable user perceptions: Exploring the role of intrinsic motivation"

published by MIS Quarterly: Management Information Systems. Next was R.S. Gajendran’s and D.A. Harrison’s work in 2007, with 490 citations for an article entitled “The Good, the Bad, and the Unknown About Telecommuting: Meta-Analysis of Psychological Mediators and Individual Consequences”. By considering the citations rate per year, this study found that the article was written by A.S. Fauci, H.C. Lane, and R.R. Redfield in 2020 entitled “Covid-19 - Navigating the uncharted” obtained the highest citations rate, which is 349.

Table 3

The five most cited-documents in telecommuting research

Rank	Cites	Cites Per Year	Authors	Year	Title	Source
1	849	40.43	V. Venkatesh	1999	Creation of favorable user perceptions: Exploring the role of intrinsic motivation	MIS Quarterly: Management Information Systems
2	490	37.69	R.S. Gajendran, D.A. Harrison	2007	The Good, the Bad, and the Unknown About Telecommuting: Meta-Analysis of Psychological Mediators and Individual Consequences	Journal of Applied Psychology
3	373	19.63	E.J. Hill, A.J. Hawkins, M. Ferris, M. Weitzman	2001	Finding an extra day a week: The positive influence of perceived job flexibility on work and family life balance	Family Relations
4	364	26	E.E. Kossek, B.A. Lautsch, S.C. Eaton	2006	Telecommuting, control, and boundary management: Correlates of policy use and practice, job control, and work-family effectiveness	Journal of Vocational Behavior
5	349	349	A.S. Fauci, H.C. Lane, R.R. Redfield	2020	Covid-19 - Navigating the uncharted	New England Journal of Medicine

Another relevant issue in the bibliometric analysis is determining the most influential authors in the field. Table 4 shows six authors with at least seven publications related to telecommuting. Mokhtarian, P.L. is the top in the list with 42 publications, followed by Salomon, I. (18 publications), Golden, T.D. (11 publications), He, B. (8 publications), Asgari, H. (7 publications), and Jin, X. (7 publications). It is noteworthy that over the last 56 years, authors from the United States associated with the University of California, Davis, Lally School of Management, Troy, and Florida International University, Miami have been the most active authors to publish in telecommuting research. This is due to some causes that increased the interest in telecommuting in the United States over the last few decades.

Stimulated by the oil shortage, telecommuting first entered the national vernacular of the United States in the 1970s, forcing staff to eliminate traffic concerns, and decision-makers began funding demonstration projects to explore the efficiency of telecommuting (Allen et al., 2015).

Table 4

Status of authors published telecommuting research with at least seven publications

Rank	Author	Articles	H-index	Affiliation	Country
1	Mokhtarian, P.L.	42	57	University of California, Davis	United States
2	Salomon, I.	18	31	Hebrew University of Jerusalem, Jerusalem	Israel
3	Golden, T.D.	11	14	Lally School of Management, Troy	United States
4	He, B.	8	5	Guangdong University of Technology, Guangzhou	China
5	Asgari, H.	7	8	Florida International University, Miami	United States
5	Jin, X.	7	10	Florida International University, Miami	United States

Authors co-authorship analysis

Collaborative publications have the most significant recognition and scientific impact, accompanied by inter-institutional collaborative articles, single-country articles, and single-author articles (Wambu & Ho, 2016). The most popular form of collaborative network is called co-authorship. The network visualization of co-authorship in telecommuting research is presented in Figure 2. Each circle refers to the author, and the size of the circle is the number of publications. The link between the two circles stands for the cooperative relationship between the two authors, and the width of the link reflects the strength of the partnership. Authors with a minimum of two publications are visualized in Figure 2 using a network visualization. Out of the 2783 authors who have conducted telecommuting research, 18 authors reached the thresholds and were related. Circles denoting authors in the same cluster suggested that the authors should work in a related area and collaborate closely. As shown in Figure 2, the largest cluster consists of three authors (marked in green color). The second cluster (turquoise) consists of two authors. The third cluster (red) consisted of four authors. The fourth cluster (yellow), the fifth cluster (violet), the sixth cluster (light blue), and the seventh cluster (orange) consisted of two researchers, respectively. The eight clusters (brown) consisted of one researcher.

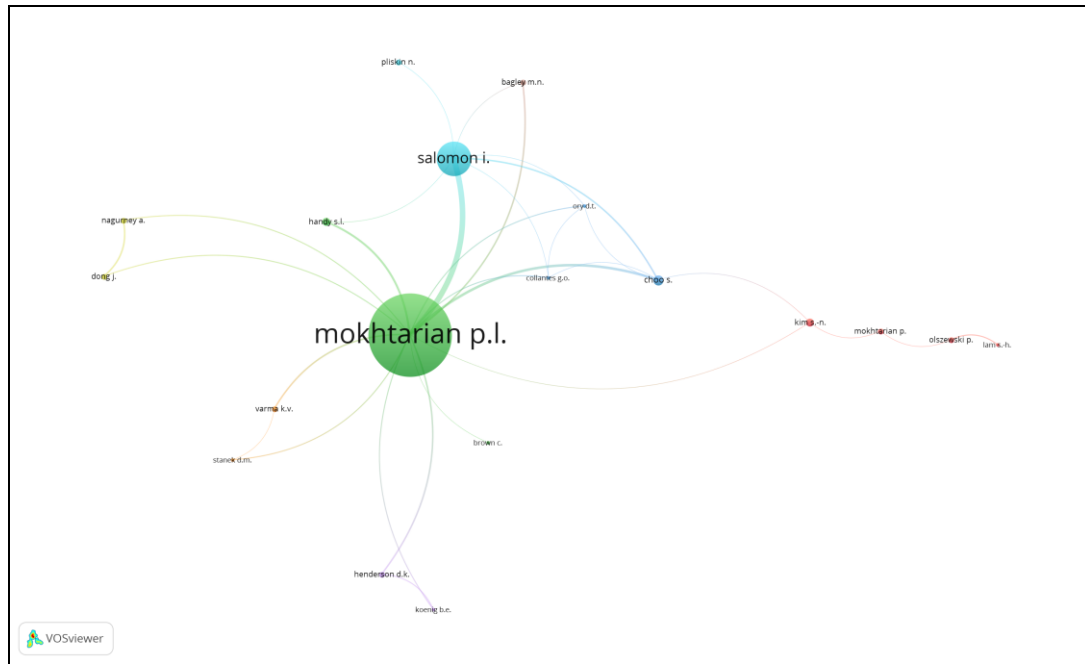


Figure 2: Network of Authors' Co-authorship

Institutions co-authorship analysis

The study of co-authorship institutions represents the degree of contact between institutions and prominent institutions in research (Reyes Gonzalez, Gonzalez Brambila & Veloso 2016). The contribution from the numerous institutions was estimated by the affiliation institute of at least one author of the written articles, and 1000 institutions had been chosen. Figure 3 presents the network of institutions performing a co-authorship analysis of 16 institutions in a single cluster.

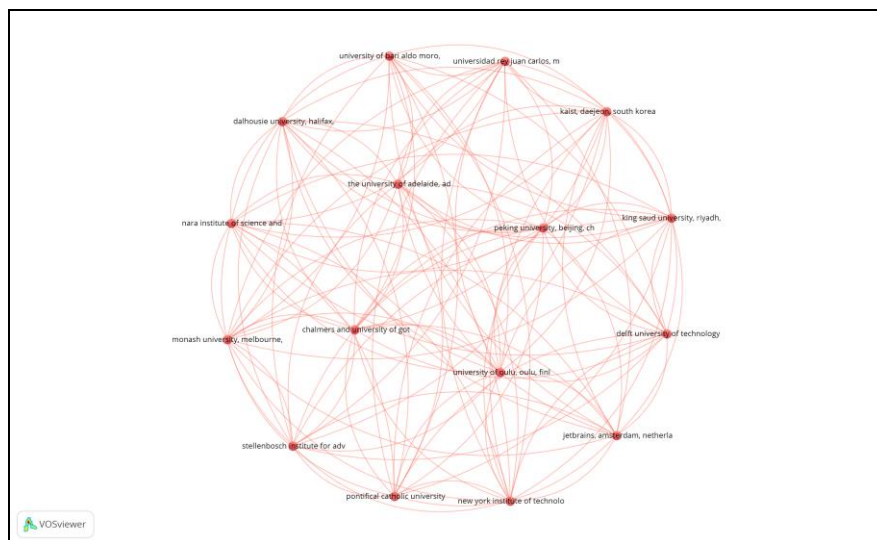


Figure 3: Network of Institutions Co-authorship

Countries co-authorship analysis

A network analysis was carried out to classify the authors' countries that have made the most contribution to telecommuting research (Figure 4). Moreover, the most productive ten countries of the network are shown in Table 5. As shown in Figure 4, the co-authorship

network consists of 36 countries and is divided into eight clusters. The nodes serve the countries, and the higher the nodes indicate many publications. In this scenario, the United States had more significant nodes. It has been revealed that the United States has many publications (647). The second rank goes to the United Kingdom with 95 publications, and Canada was in the third rank with 72 publications. Co-authorship analyses have shown that the United States has become a focal point and has cooperated closely with several nations such as the United Kingdom, Ireland, Denmark, Israel, and India, illustrating the fact that increasing international exchanges have encouraged scholarly cooperation and play an essential role in improving scientific interaction in telecommuting research. The most productive ten countries of the network are shown in Table 5.

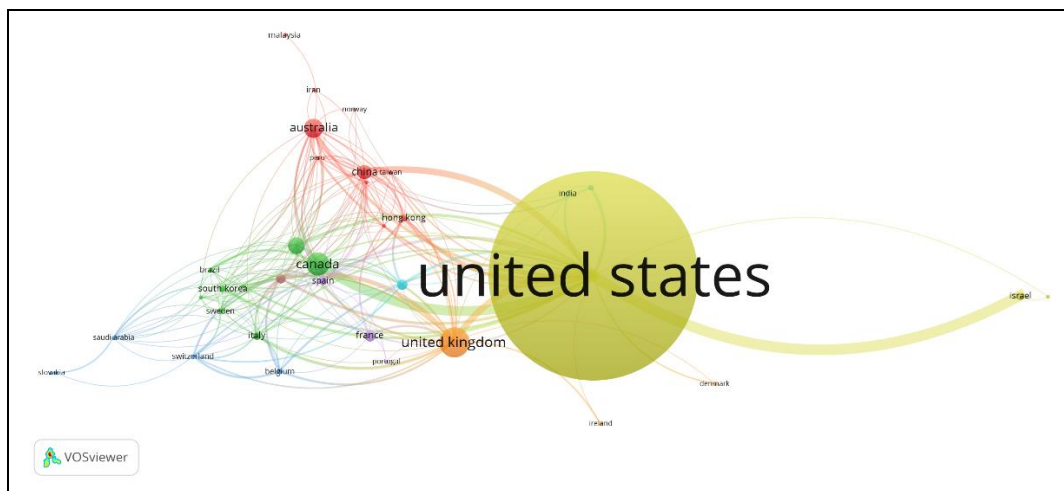


Figure 4: Network of Institutions Co-authorship

Table 5

Status of the top ten countries

Rank	Countries	Publications	Percentage (%)
1	United States	651	44.80
2	United Kingdom	95	6.54
3	Canada	72	4.96
4	Australia	60	4.13
5	Japan	52	3.58
6	China	46	3.17
7	France	36	2.48
8	Germany	32	2.20
9	Netherlands	31	2.13
10	Israel	27	1.86

Keywords co-occurrence analysis

This section provides a visual description to deepen the conclusions of the authors' co-occurrence keywords. VOS viewer also allows for analyzing the most frequent keywords appearing in a given set of publications. In this analysis, VOSviewer had mapped the keywords of the authors. Figure 5 provides a network diagram of the author's keywords in which various colors, node sizes, font sizes, and the thickness of the connecting lines illustrate

the relationship with other keywords (Sweileh et al. 2017). Keywords that appeared more than five times, with a count of 69, were included in the map. VOSviewer divided the keywords into eight main clusters representing 69 authors' keywords. The keyword "telecommuting" in green nodes is the most frequent keyword. Some different popular keywords in terms of co-occurrence are "telework", "remote work", "information technology", "virtual work", "work-life balance", and "covid-19". This confirms that research on telecommuting has an interdisciplinary perspective and connects with a wide range of fields, including computer science, health, business and management, and social sciences.

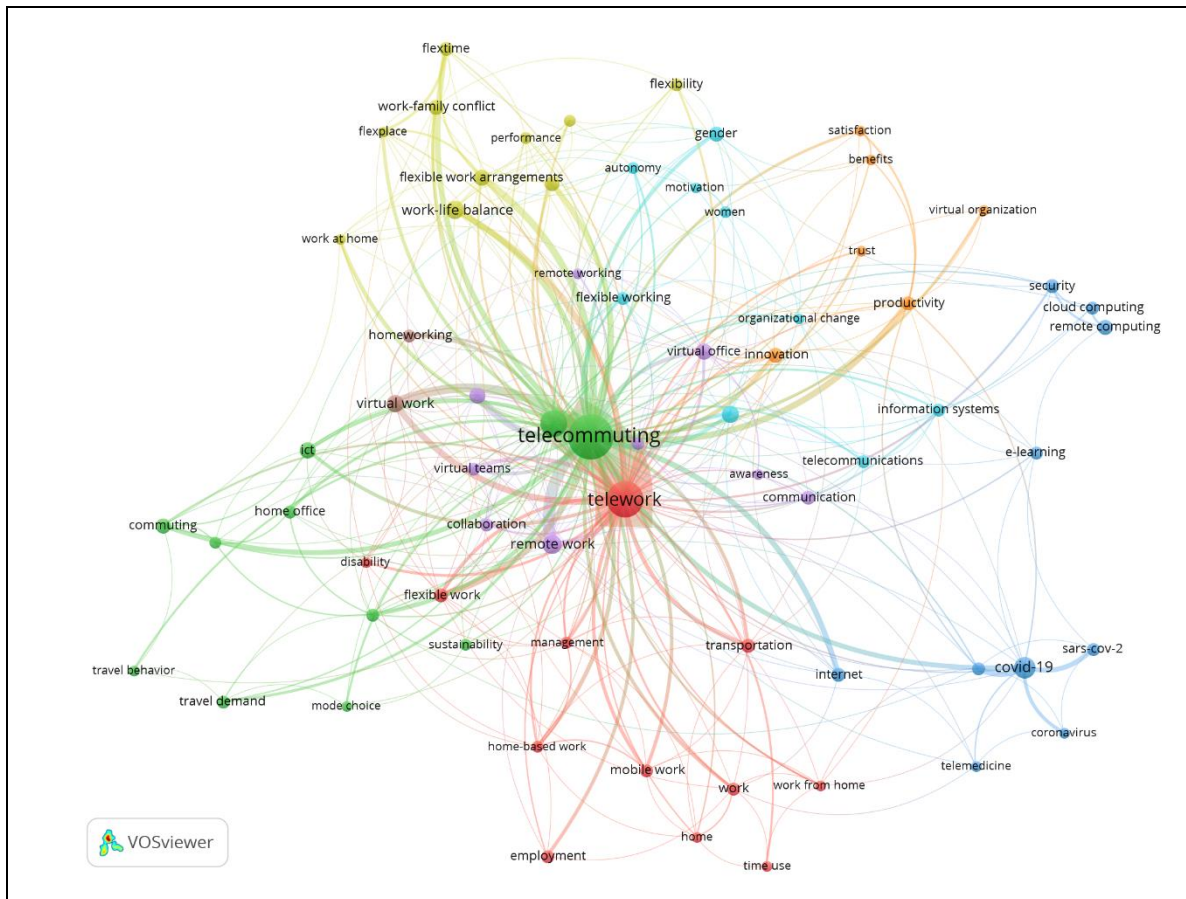


Figure 5: Network Visualization Map of Authors' Keywords

Discussion

Telecommuting workers have nearly doubled in the last two decades. This is hardly unexpected given the many advantages of working from home, including higher productivity, job satisfaction, and lower overhead. Providing remote working options appears to be something that many companies can do with little thinking. Nevertheless, telecommuting is a novel notion with its own set of concerns. While many of these issues are typical among home-based professionals, solutions are readily available to those committed to telecommuting. This study conveys a concise summary of the future of telecommuting research to help readers and researchers obtain valuable insight into their studies. It is also beneficial to make significant additions to present telecommuting research. This study is based on the evolution and the progression of publications pertaining to telecommuting research worldwide that have been indexed in the Scopus database. The VOSviewer software

was customized to conduct assessments and visualize all data acquired during the scrutinizing process.

The evolution and progression of telecommuting research are denoted with publications increasing significantly and soaring exponentially by 180 in 2020, fourfold over 2019. It is interesting to note that this scenario might occur due to the global Covid-19 pandemic, which leads to an ongoing change to remote work in 2020 and is expected to continue to some point in future research. In response to the Covid-19 pandemic, many companies have adopted telecommuting workers to ensure market stability and meet social distance needs. The effect of telecommuting on accessibility and family-work conflict is seen as a crucial issue for researchers and policy-makers (Lyttelton et al., 2020). Apart from the high infection risk of the virus, federal, state, and municipal authorities have closed schools and businesses and limited neighborhood meetings in most infected countries. Teleworking enhances perceived performance without flipping about the expected workplace disruptions (Lincoln et al., 2020). Also, the number of researchers worldwide and the increased number of telecommuting research in the Scopus database have undoubtedly affected the number of publications. By witnessing the exponential growth observed in telecommuting research between 1994 and 2020, it can be construed that this research area is pertinent and reputable.

Based on the research areas, telecommuting research was prominently a focus of the social science nuance. A possible explanation is that theoretical issues affecting telecommuting, such as the nature of the work performed while telecommuting, organizational mechanisms such as information exchange and creativity, and external factors, such as family responsibilities, provide better explanations for telecommuting in a social milieu (Allen et al., 2015). Another compelling research area is computer science. This finding indicates that telecommuting and data sharing remains central to modern networks and internet retrieval systems. Unlike traditional systems, the current information system functions in an immersive online mode, enabling the user to communicate with the host from a varied remote locations via a contact connection (Arora et al., 2013; Tate et al., 2019). Also, with the telecommuting environment continuously changing and the information technology industry improving, the use of electronic energy and computer technology will have something to expect in the coming years (Raji-Lawal et al., 2020). Thus, our findings indicate that a diverse range of telecommunications concepts and research disciplines could contribute to a more comprehensive knowledge of the impact of telecommunications on producing productive employees and meeting organizational goals.

Transportation Research Record, New Technology Work and Employment, and Transportation are the three most prolific source titles in this study. Hence, it is signified that those source titles have contributed helpful knowledge that will allow prospective researchers to refer to and benefit their future telecommuting research. Additionally, the study of source titles revealed that research on telecommuting has been widely published in various conferences and proceedings. The findings imply that conference proceedings include a sizable portion of the published literature and are critical for disseminating information to researchers (Lisée, Larivière, & Archambault, 2008).

Based on the most cited document, academic work published by V. Venkatesh stands to be the most cited publication for an article entitled "Creation of favorable user perceptions: Exploring the role of intrinsic motivation" published by MIS Quarterly: Management Information Systems. The article discusses a significant issue confronting academics and

practitioners of information systems has been the difficulty of eliciting good user reactions to new technology. The findings greatly favored training with intrinsic motivation. Based on the article, it is imperative to comprehend the factors contributing to telecommuting technology adoption. At the same time, telecommuting significantly affects motivation, where motivation also greatly impacts job performance (Awit & Marticio, 2022).

It has been revealed that the United States, the United Kingdom, and Canada had a significant nexus of co-authorship by countries. Captivatingly, co-authorship analyses have shown that the United States has become a focal point and has cooperated closely with several countries such as the United Kingdom, Ireland, Denmark, Israel, and India. Thus, this finding illustrates that increasing international exchanges have encouraged scholarly cooperation and play an essential role in improving scientific interaction in telecommuting research. It is deemed crucial since current trends in multidisciplinary and worldwide collaborations and citation analyses significantly impact authorship patterns, specialized journals, and determining the scientific quality of articles (Gasparyan, Ayvazyan & Kitas, 2013).

It is noteworthy that over the last 56 years, authors from the United States associated with the University of California, Davis, Lally School of Management, Troy, and Florida International University, Miami have been the most active authors to publish in telecommuting research. This is due to some causes that increased the interest in telecommuting by the United States over the last few decades. Stimulated by the oil shortage, telecommuting first entered the national vernacular of the United States in the 1970s, forcing staff to eliminate traffic concerns, and decision-makers began funding demonstration projects to explore the efficiency of telecommuting (Allen et al., 2015).

The keyword “telecommuting” is the most frequent keyword that nexus closely to some different popular keywords such as “telework”, “remote work”, “information technology”, “virtual work”, “work-life balance”, and “covid-19”. The results confirm that research on telecommuting has an interdisciplinary perspective and connects with a wide range of fields, including computer science, health, business and management, and social sciences. The co-occurrence of author keywords also revealed that most publications in telecommuting research are related to recent technological advancements that enable ever-affordable mobile connections. This finding established the rationale of Kizza (2013), where telecommuting opportunities increased along with home computer capabilities. A likely reason is that since the 1980s, when personal computers were introduced, followed by laptops and cell phones in the 1990s, the prices and sizes of these devices have reduced while the speed and bandwidth have improved (Kizza, 2013). As a result, working away from the office as a telecommuter has become increasingly accessible to many workers worldwide. Indirectly, it is implied that telecommuting has grown in popularity and piqued the curiosity of both scholars and practitioners.

Conclusion

In conclusion, this bibliometric review promotes examining and integrating established directions in telecommuting research and the emerging new trends. Based on a bibliometric review of 56 years of telecommuting research, this review found that the information below will be able to provide readers, practitioners, and researchers with the related facts:

1. The number of publications on telecommuting research had fluctuated, and the highest number of publications was 180 in 2020.

2. “Social Sciences” became the most researched area, with 503 publications in telecommuting research.
3. The Transportation Research Record seems to be the most influential source title in telecommuting research.
4. V. Venkatesh is the most cited publication of all times, with 849 citations for an article entitled “Creation of favorable user perceptions: Exploring the role of intrinsic motivation” published by MIS Quarterly: Management Information Systems. Mokhtarian, P.L. became the most influential author in telecommuting with 42 publications.
5. Co-authorship analyses have shown that the United States has been a focal point and has collaborated closely with other countries. It is indicated that the growing foreign collaborations have facilitated academic collaboration and played an essential role in enhancing intellectual engagement in telecommuting research.
6. Research on telecommuting has an interdisciplinary perspective, as it connects with a wide range of fields, including computer science, health, business and management, and social sciences.

Limitations and future research

This study has some limitations that can provide direction for future studies. First, the current study examined and mapped an article published in the Scopus database using various bibliometric methods, including productivity and growth metrics and relational methods involving co-authorship and co-occurrence analysis. As a result, the findings of this study were limited to identifying the central themes or critical keywords associated with telecommuting research. Thus, if future studies wish to expand on the background or address broad concerns to provide the best relevant evidence synthesis, they are recommended to use more traditional review methodologies, such as systematic literature reviews or meta-analyses. Additionally, other rational bibliometric metrics such as bibliographic coupling are recommended if future researchers are interested to understand telecommuting research’s scientific productions better. Second, this paper concentrated on peer-reviewed articles from the Scopus database. Thus, the findings are restricted to articles or academic works only available through the Scopus database. Suppose future researchers are interested in producing a more comprehensive overview of telecommuting research’s leading trends, directions, and performance. In that case, other databases such as Google Scholar and Microsoft Academic can be considered for the analysis. Third, VOSviewer software analyzed and mapped the collected and retrieved data. This software only captured networks with fewer than 10,000 nodes and was limited by computational and memory constraints. Thus, if future studies would like to visualize big data in various contexts, then software programs such as the R package, BibExcel, CiteSpace, and SciMAT can be utilized. Finally, the scope of a bibliometric analysis is constrained. Only publications that adhere to the methodology’s search refinement (“telecommuting”) have been included. The report’s major shortcoming is limiting scientific results and not assisting various organizations in fully comprehending telecommuting. Therefore, future research that is interested in evaluating the pattern in telecommuting publications relevant to key performance indicators is suggested to insert additional keywords based on various organizations such as “telecommuting” AND “education” or “telecommuting” AND “banking industry” or “telecommuting” AND “public and private organizations.” This is critical for determining the most effective key performance

indicators for measuring remote work productivity in various organizations.

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