

P. Gao^{1*}, B. Turebekova¹, A. Kłoczko-Gajewska²

¹ Al-Farabi Kazakh National University, Almaty, Kazakhstan

² Warsaw University of Life Science, Warsaw, Poland

*e-mail: 18698124174@163.com

RESEARCH TRENDS IN EMPLOYEE MOTIVATION IN REMOTE WORK CONDITION: A BIBLIOMETRIC ANALYSIS

The COVID-19 pandemic has not only fundamentally transformed organizational practices, but leading to an unprecedented shift toward remote work at the same time. This study focuses on understanding the relationship between remote work and employee motivation, which has attracted increased interests in the post-pandemic era. The purpose of this study is to conduct a bibliometric review of the literature, highlighting key research trends, central themes, and influential contributions in this field.

Based on 50 publications retrieved from the Web of Science Core Collection, the analysis employs mapped publication trends, citation structures, keyword co-occurrence networks, and leading countries by using scientific research tools include VOSviewer and CiteSpace. The findings reveal significant research clusters addressing psychological well-being, job satisfaction, autonomy, and the integration of digital tools in modern organizational practices. Notably, the results show an exponential growth in academic interest beginning in 2020, driven by the global adoption of remote work and its implications for employee motivation.

The analysis contributes to the existing theoretical system by providing a comprehensive overview of research developments in remote work and employee motivation. The analysis identifies three potential future research directions: exploring the dynamic evolution of motivational needs in remote work environments, assessing the long-term impacts of remote work on mental health and organizational outcomes, and evaluating the effectiveness of new motivational strategies, such as autonomy support, in mitigating employee burnout.

The significance of the research is informing organizational leaders and policymakers about emerging trends and effective motivational strategies, helping them to enable better adaptation to remote and hybrid work environments in the future.

Key words: employee motivation, remote work, bibliometric analysis.

П. Гао^{1*}, Б.О. Түребекова¹, А. Клочко-Гаевска²

¹ Әл-Фараби атындағы Қазақ ұлттық университеті, Алматы қ., Қазақстан

² Варшава Жаратылыстану ғылымдары университеті, Варшава қ., Польша

*e-mail: 18698124174@163.com

Қашықтан жұмыс істеу жағдайындағы қызметкерлерді ынталандыру саласындағы зерттеу тенденциялары: библиометриялық талдау

COVID-19 пандемиясы ұйымдық тәжірибені түбегейлі өзгертіп қана қоймай, сонымен бірге қашықтан жұмыс істеуге бұрын-соңды болмаған ауысуға әкелді. Бұл зерттеу пандемиядан кейінгі кезеңде қызығушылықты арттырған қашықтан жұмыс пен қызметкерлердің мотивациясының арасындағы байланысты түсінуге бағытталған. Бұл зерттеудің мақсаты – негізгі зерттеу тенденцияларын, орталық тақырыптарды және осы саладағы ықпалды үлестерді көрсете отырып, әдебиеттерге библиометриялық шолу жасау.

Web of Science Core Collection ішінен алынған 50 жарияланымға негізделген талдауда VOSviewer және CiteSpace сияқты ғылыми зерттеу құралдарын пайдалана отырып, салыстырылған жарияланым тенденциялары, дәйексөз құрылымдары, кілт сөздердің бірігуі желілері және жетекші елдер қолданылады. Нәтижелер психологиялық әл-ауқат, жұмысқа қанағаттану, автономия және заманауи ұйымдастырушылық тәжірибелердегі цифрлық құралдарды біріктіру мәселелерін қарастыратын маңызды зерттеу кластерін көрсетеді. Атап айтқанда, нәтижелер 2020 жылдан бастап қашықтан жұмыс істеуді жаһандық қабылдауға және оның қызметкерлердің мотивациясына әсер ететін академиялық қызығушылықтың экспоненциалды өсуін көрсетеді.

Жүргізілген талдау қашықтықтан жұмыс істеу және қызметкерлерді ынталандыру саласындағы ғылыми әзірлемелерге жан-жақты шолу жасай отырып, қолданыстағы теориялық жүйені толықтырады. Жүргізілген талдау болашақ зерттеулердің үш ықтимал бағытын анықтады:

шықтан жұмыс істеудегі мотивациялық қажеттіліктердің динамикалық эволюциясын зерттеу, қашықтан жұмыс істеудің психикалық денсаулыққа ұзақ мерзімді әсерін және ұйымның нәтижелерін бағалау және қызметкерлердің шаршауын азайту үшін автономияны қолдау сияқты жаңа мотивациялық стратегиялардың тиімділігін бағалау.

Зерттеудің маңыздылығы ұйым жетекшілері мен саясаткерлерді келешекте қашықтағы және гибриді жұмыс орталарына жақсы бейімделуге көмектесетін жаңа трендтер мен тиімді мотивациялық стратегиялар туралы ақпараттандыру болып табылады.

Түйін сөздер: қызметкерлерді ынталандыру, қашықтан жұмыс істеу, библиометриялық талдау.

П. Гао^{1*}, Б. Туребекова¹, А. Клочко-Гаевска²

¹Казахский национальный университет имени аль-Фараби, г. Алматы, Казахстан

²Варшавский университет естественных наук, г. Варшава, Польша

*e-mail: gao18698124174@gmail.com

Тенденции в исследовании мотивации сотрудников в условиях удаленной работы: библиометрический анализ

Пандемия COVID-19 не только кардинально изменила организационные практики, но и одновременно привела к беспрецедентному сдвигу в сторону удаленной работы. Это исследование фокусируется на понимании взаимосвязи между удаленной работой и мотивацией сотрудников, что привлекло повышенный интерес в эпоху после пандемии. Целью этого исследования является проведение библиометрического обзора литературы, выделение ключевых тенденций исследований, центральных тем и влиятельных вкладов в этой области.

На основе 50 публикаций, извлеченных из Web of Science Core Collection, анализ использует сопоставленные тенденции публикаций, структуры цитирования, сети совместного появления ключевых слов и ведущие страны с использованием научно-исследовательских инструментов, включая VOSviewer и CiteSpace. Результаты показывают значимые исследовательские кластеры, посвященные психологическому благополучию, удовлетворенности работой, автономии и интеграции цифровых инструментов в современные организационные практики. В частности, результаты показывают экспоненциальный рост академического интереса, начиная с 2020 года, обусловленный глобальным принятием удаленной работы и ее последствиями для мотивации сотрудников.

Анализ вносит вклад в существующую теоретическую систему, предоставляя всесторонний обзор научных разработок в области удаленной работы и мотивации сотрудников. Анализ определяет три потенциальных будущих направления исследований: изучение динамической эволюции мотивационных потребностей в удаленной рабочей среде, оценка долгосрочного воздействия удаленной работы на психическое здоровье и организационные результаты, а также оценка эффективности новых мотивационных стратегий, таких как поддержка автономии, в смягчении выгорания сотрудников.

Значимость исследования заключается в информировании руководителей организаций и политиков о новых тенденциях и эффективных мотивационных стратегиях, что поможет им лучше адаптироваться к удаленной и гибридной рабочей среде в будущем.

Ключевые слова: мотивация сотрудников, удаленная работа, библиометрический анализ.

Introduction

Employee motivation is a crucial factor in organizational success, influencing employee performance and productivity. It is defined as the driving force that compels employees to use their abilities to complete tasks and achieve organizational goals (Riak PhD, 2022). Motivation plays a vital role in both public and private sector organizations, significantly impacting service quality and employee performance (Riak PhD, 2022). The concept of employee motivation is multifaceted, encompassing various factors such as individual needs, personal

preferences, and work environment (Mohd Said, 2015)

However, COVID-19 has brought profound changes in work environments, accelerating the adoption of remote work models and fundamentally reshaping the thought of organizations about how to approach employee motivation.

Remote work brought notable benefits such as cost reduction, flexibility, and a possibility to improve work-life balance. At the same time, remote work also caused challenges. Employees have reported social isolation, increased stress, and difficulties maintaining boundaries between personal and

professional life, which have negatively affected their job satisfaction and performance (Khorakian, 2023).

The traditional employee motivation system has shown its limitation on effectively dealing with changes brought by higher popularity of remote work. Therefore, it is necessary to conduct research on new employee motivation methods in remote and hybrid environments.

Research on employee motivation has a long history. Back to 1943, Maslow proposed the hierarchy of needs, which is driven by a progression of needs. 57 years later, Ryan and Deci (2000) proposed the self-determination theory (SDT), which emphasizes that autonomy, competence, and relatedness have strong influence on employee motivation. From the last century, there are many classic theories proposed by scholars, but the research combining remote work and employee motivation has only been around for a short time, and the comprehensiveness of the research needs to be improved. Combining with remote work and employee motivation, the most recent research has explored topics such as “job satisfaction, happiness, and remote work engagement”, but there is still a lack of comprehensive analysis on how these factors interact with organizational results. In addition, there is still a gap in the research on effectively distinguishing between “employee burnout and performance decline caused by remote work” and “employee burnout and performance decline caused by traditional factors.” For the problem of employee burnout, traditional methods include providing employees with vacations, and the mental state of employees will be significantly relaxed after leaving a fixed work location (such as the company). However, in a remote work environment, it is difficult for employees to get out of work through changes in the physical work environment, such as employees working from home. How to help employees effectively get out of work mentally could be a new research direction.

To better analyze the current state of research, this study uses bibliometric analysis to systematically explore the trends, relationships, and emerging topics in the literature by using scientific tools such as VOSviewer and CiteSpace. Bibliometric analysis uses statistical techniques to examine large datasets of scholarly publications, identify co-occurrence networks, citation patterns, and research clusters. By analyzing publications indexed in the Web of Science Core Collection, this study maps the knowledge structure and development of remote work and employee motivation research. VOSviewer is used

to visualize keyword co-occurrence networks and cluster major research topics, while CiteSpace reveals citation dynamics and emerging trends over time.

The results of this study contribute to the academic discussion of employee motivation and remote work by providing a comprehensive understanding of the evolution of knowledge in this field. It highlights key research topics and trends, identifies gaps in the existing literature, and proposes areas for future research. By providing an in-depth bibliometric analysis, this study provides a valuable reference for scholars seeking and exploring innovative ways to motivate employees in remote and hybrid work environments.

Literature review

The COVID-19 pandemic has brought tremendous changes to society and accelerated the transition from traditional working models to new working models. Before the pandemic, although many companies were already technically capable of remote work, remote work was more of an emergency way of working. During the pandemic, many companies were forced to adopt online remote work for all or most of the employees to maintain their operations due to the requirements of quarantine and social distancing policies. It is precisely because of the change in objective conditions that people’s way of thinking has also changed. Therefore, even though the pandemic is over, remote work has become an indispensable way of working in the modern workplace. This shift has brought opportunities and challenges to organizations and employees. On the one hand, remote work provides flexibility, cost savings, and access to a wider talent pool. Studies have found that remote work has a generally positive impact on short-term employee well-being (Crawford, 2022), and some employees reported that their work efficiency has increased, and their work-life balance has improved due to the flexibility of working from home (Adnan Jawabri, 2022). On the other hand, employees have also experienced challenges such as social isolation and remote work stress, which have had a negative impact on job satisfaction and performance (Khorakian, 2023).

Employee motivation is a key driver of organizational success, and the pandemic has had a significant impact on it. Traditional motivational strategies rely on face-to-face interactions and structured environments that are not available under remote work conditions.

On the one hand, in the context of remote work, traditional extrinsic motivators may not be as effective as previously thought. In the traditional employee motivation system, manager managers can set an example by rewarding individuals, thereby exerting a positive and leading effect on the people around him. For example, a study on environmental protection found that when a company encouraged employees to choose a vegetarian lunch to protect the environment, more employees would choose a vegetarian lunch in a collective environment of company employees due to the herd mentality (Kaiser, 2020). However, if this happens under remote working conditions, when employees are not in a group environment, it is uncertain whether they will choose a vegetarian lunch. Therefore, it is also a worth research direction that whether the original group-oriented motivational measures are still applicable to individuals who are out of the group effect.

On the other hand, researchers are exploring whether intrinsic motivational factors, such as autonomy, and individual goals, can play a greater role under remote working conditions, because these factors are consistent with the psychological needs emphasized by self-determination theory (Ryan, 2000). To balance the remote working model with the traditional face-to-face working model and take into account the advantages of both, the hybrid working model has been proposed as a potential solution. The research shows that hybrid work models can improve employee motivation and job satisfaction by providing greater flexibility, as the same time, addressing the problems and challenges brought by fully remote work (Sonnenschein, 2022). Some studies also point out that improving employees' remote work experience will also generate positive motivation for employees. Innovative methods such as gamification and digital engagement tools can effectively improve employee work engagement (Pura, 2022). Gamification platforms enable organizations to reward employee achievements and encourage participation, while digital tools promote seamless collaboration and engagement among distributed teams.

Despite these advancements, several research gaps remain. First, there is limited exploration of how different work models affect employees' motivational needs across diverse organizational and cultural contexts. Second, the interplay between psychological well-being, such as burnout and job satisfaction, and organizational outcomes requires further investigation. Third, while digital tools are

increasingly used for motivation, their long-term effectiveness and ethical implications warrant deeper analysis.

This review underscores the need for a comprehensive understanding of how employee motivation evolves in response to remote and hybrid work settings. By addressing these gaps, future studies can contribute to the development of tailored motivational strategies that align with the evolving needs of employees and organizations.

Methodology

A statistical review is always used for researchers to better understand the trend and knowledge structure within a specific topic in a subject field. A bibliometric analysis primarily reviews the information on publications, keywords, productivity of countries, etc. It will be helpful for researchers to summarize the most current direction and trends of research fields through bibliometric analysis, which will also provide ideas and directions for future research

According to the previous study, bibliometric analysis is used to review the recent situation and trends of remote work and employee motivation research. The article uses VOSviewer, which is a visualization tool of bibliometric analysis, to conduct data analysis and visualization for the remote work and employee motivation visual analysis.

Web of Science Core database is used as the source for collecting data of publications. It is considered as a more authoritative source for citation spatial analysis and bibliometric analysis.

Motivation is the "willingness to exert high levels of effort toward organizational goals, conditioned by the effort's ability to satisfy some individual need." (Ramlall, 2004) This study concerns remote work and employee motivation as an integrated part. Considering this factor, search topic keywords are defined as "remote work" and "employee motivation" in the research element. Time span was not set. Therefore, the entire research history is displayed in a clear and completely visualized way.

Figure 1 shows the selection process of selecting target articles:

Based on the categories of Web of Science, literature that not related to management fields and economic fields was excluded, and the categories of management, business, business finance, industrial relations labor, economics, educational research, communication, behavioral science, psychology related categories remained;

The analysis will only include literature reviews and articles;

The language of the papers is limited in English. 102 publications were obtained in the research, and

another 52 publications, which containing 36 non-management and economic categories were excluded.

Finally, 50 articles were downloaded and processed for further analysis.

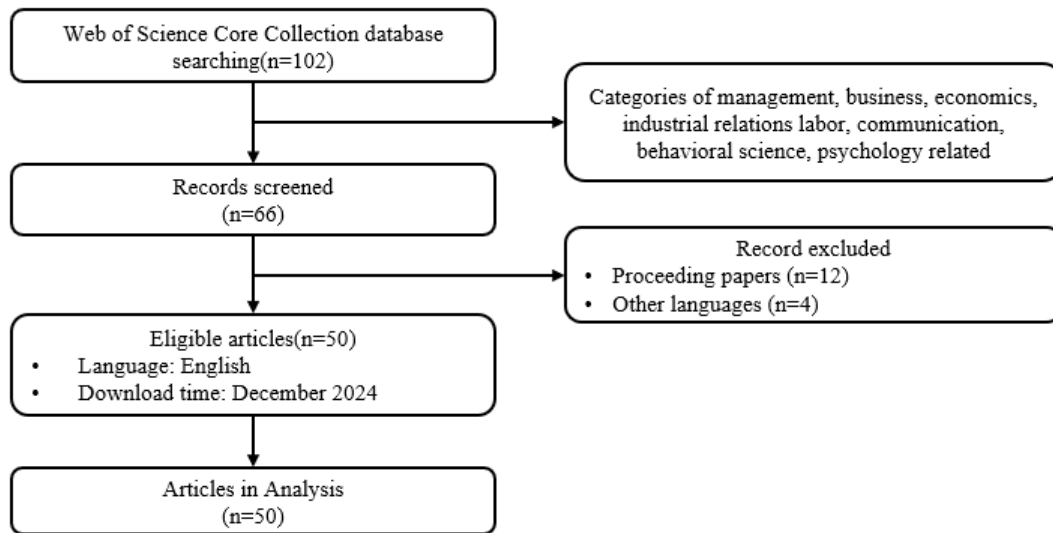


Figure 1 – Selection process for including articles in the study
Note – complied by author

Results and discussion

Analysis of the number of publications shows the changes in the attention paid to this field. Fig. 2 shows the clear trend of citations and publications. It can be sliced into three periods.

Pre-2019 Stability: Prior to 2018, the field had a low level of activity, reflecting its niche status. Employee motivation and remote work were not yet seen as urgent or interdependent areas of research.

2020 dual Growth: The onset of the pandemic in 2020 likely led to an initial increase in research interest as scholars began addressing emerging challenges in employee motivation and remote work adaptation.

2021-2024 Surge: A sharp rise in both publications and citations suggests that the field gained significant traction during this period. The increase in citations reflects the growing recognition of these studies as foundational or highly relevant to the evolving workplace context

There are five potential reasons to explain this trend. The first is the impact of the COVID-19 Pandemic. The COVID-19 pandemic served as a major catalyst for the proliferation of research in remote work and employee motivation. Organizations worldwide adopted remote work models as a neces-

sity, prompting academic inquiry into its implications for productivity, employee well-being, and motivation. Researchers began exploring how traditional workplace dynamics were disrupted and what new strategies were needed to maintain employee engagement in a virtual environment.

The second reason is the emergence of remote and hybrid work as a new norm. Even as the immediate crisis subsided, many organizations continued with remote or hybrid work models. This change creates opportunities for longitudinal research as scholars seek to understand how these changes will affect organizational culture, communication, and motivational strategies. Topics such as flexibility, autonomy, and work-life balance have attracted more interest among researchers and further drive the volume of publications.

The third reason is the increased awareness of mental health and well-being. As a result of the pandemic, people are beginning to pay more attention to mental health. Coincidentally, the negative effects of remote work on employees are mainly concentrated in the mental aspects, such as stress or burn-out. Therefore, personal motivation and well-being are attracting more interests, and further promoting research on the psychological aspects of remote work.

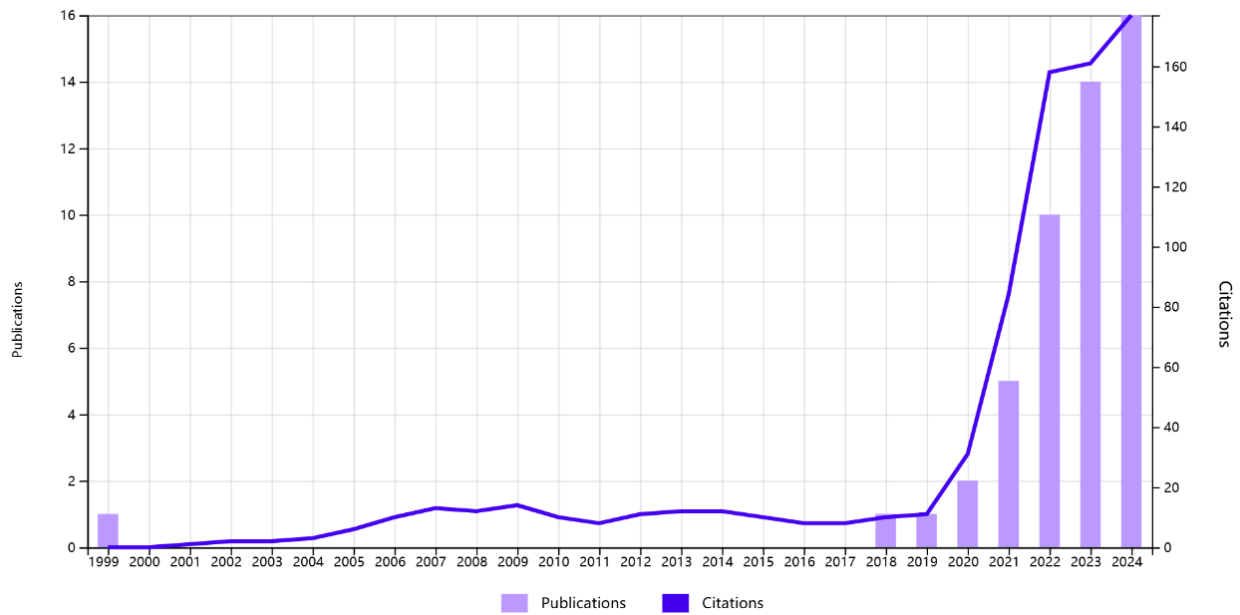


Figure 2 – Remote work and employee motivation papers published annually
 Note – The result is obtained from Web of Science

The fourth reason is the rise in funding and collaboration opportunities. Governments and private organizations have significantly increased investments in research focused on helping employees to better adapt new work patterns brought by Covid. More sufficient funds provide better resources for scholars to conduct related research. Therefore, the number of new studies and citations has increased.

The last reason is the shift in organizational priorities. Companies became more interested in academic research to develop evidence-based practices for motivating employees in a remote or hybrid setup. This increased practical relevance likely contributed to the rising citations, as practitioners turned to academic literature for solutions.

Furthermore, citation structure analysis is helpful for identifying articles contributing and key authors on remote work and employee motivation research. Table 1 lists top 15 cited papers from past to present. The top one paper belongs to D. Sandy Staples(1999), who observed that remote employees' self-efficacy assessments will generate obvious impact on remote work effectiveness, job satisfaction, perceived productivity, and ability to cope. The second most cited paper was written by Bartsch (2021), who confirmed that relation- and task-oriented leadership behavior is closely related employee motivation, at the same time, maintain service em-

ployees' work performance during crisis situations. Delfino(2021) proposed that compared with past, employees now are paying more attention on getting noted by their superiors. Covid-19 has brought some new challenges such as increased stress levels of employees, a weakened sense of relatedness with others, and changed perceptions of hierarchies. All of these changes brought the new challenge to employee motivation. In the fourth position, Jämnen & Sivunen(2022) comprehensively explored the challenges brought by remote work to relational communication in organizations, highlighting its importance to coping and employee well-being. Improving relational communication in organizations can bring brightly positive impact to employee enjoyment and personal satisfaction, which are considered as the main part of intrinsic motivation (Ann Renninger, 2000)

Analyzing paper citation structure by year is helpful in understanding the popularity of research field. The analysis classified and counted the citation structure. The result was presented as shown in Table 2. There are 4% of the publications had more than 200 citations, and 32% of them had more than 10 citations. More importantly, 62% of the papers on remote work and employee motivation were cited at least once, showcasing moderate academic engagement. Besides, a significant jump in publication volume occurred in 2023 (12 papers) and 2024

(19 papers), suggesting increased research output or funding in the field. Compared with 2019 and 2020, the total citation of 2021 and 2022 increased rapidly. Even total citation dropped in 2023 and 2024, con-

sidering the average period of SSCI article publication, the trend is still clear. The research of remote work and employee motivation is receiving widespread attention.

Table 1 – Top 15 cited papers about remote work and employee motivation

Rank	Total citations	Title	Author	Publication Year	Citations per paper(C/Y)
1	372	A self-efficacy theory explanation for the management of remote workers in virtual organizations	Staples, DS; Hulland, JS; Higgins, CA	1999	15
2	229	Leadership matters in crisis-induced digital transformation: how to lead service employees effectively during the COVID-19 pandemic	Bartsch, S et al.	2021	76
3	63	Remote working, management control changes and employee responses during the COVID-19 crisis	Delfino, GF; van der Kolk, B	2021	21
4	43	Employees' perceptions of relational communication in full-time remote work in the public sector	Jämsen, R; Sivunen, A; Blomqvist, K	2022	22
5	40	An organizational analysis of how managers must understand the mental health impact of teleworking during COVID-19 on employees	Shipman, K et al.	2023	40
6	26	Employees' dedication to working from home in times of COVID-19 crisis	Prodanova, J; Kocarev, L	2022	13
7	25	Leadership behaviour, team effectiveness, technological flexibility, work engagement and performance during COVID-19 lockdown: An exploratory study	Koekemoer, L et al.	2021	8
8	17	Motivation and Productivity of Employees in Higher Education during the First Lockdown	Rietveld, JR et al.	2022	9
9	17	Workplace Spirituality and Employee Wellbeing in the Hospitality Sector: Examining the Influence of Fear of COVID-19	Aboobaker, N	2022	9
10	15	Leading Innovative Work-Behavior in Times of COVID-19: Relationship Between Leadership Style, Innovative Work-Behavior, Work-Related Flow, and IT-Enabled Presence Awareness During the First and Second Wave of the COVID-19 Pandemic	Coun, MJH et al.	2021	5
11	12	If I had known, I would have applied: poor communication, job dissatisfaction, and attrition of rural health workers in Sierra Leone	Narayan, V et al.	2018	2
12	11	Remote working and occupational stress: Effects on IT-enabled industry employees in Hyderabad Metro, India	Prasad, KDV; Vaidya, R; Rani, R	2023	11

Continuation of the table

Rank	Total citations	Title	Author	Publication Year	Citations per paper(C/Y)
13	11	Employment risks under the conditions of the COVID-19 pandemic and their impact on changes in economic behaviour	Mishchuk, H; Bilan, Y; Mishchuk, V	2023	11
14	10	Remote working in Italian SMEs during COVID-19. Learning challenges of a new work organization	Barabaschi, B et al.	2022	5
15	10	New insights on employee adaptive performance during the COVID-19 pandemic: Empirical evidence from Indonesia	Tan, R; Antonio, F	2022	5

Note – The result is based on data from Web of Science Core Collection database

Table 2 – Paper citation structure by year

Year	Total paper	Total citations	≥200	≥100	≥50	≥20	≥10	≥5	≥1
1999	1	392	1						
2018	1	12					1		
2019	1	9						1	
2020	1	4							1
2021	4	332	1		1	1	1		
2022	11	147				2	4	3	2
2023	12	74				1	2		5
2024	19	15					1		3
Ratio(%)	□	□	4	4	6	14	32	40	62

Note – The result is based on data from Web of Science Core Collection database
 ≥200, ≥100, ≥50, ≥20, ≥10, ≥5 and ≥1 represent number of papers equal to or greater than 200, 100, 50, 20, 10, 5, and 1 citation, respectively.

By analyzing the number of publications and citations from different countries, researchers can better understand which countries have greater influence in this academic field and provide guidance for subsequent cooperation and case studies. Table 3 shows the top 5 countries with the most productive and influential publications on employee motivation and remote work. The USA leads in research output due to its advanced academic infrastructure, strong funding for research, and a significant emphasis on workplace trends like remote work. The pandemic further fueled studies on employee motivation in remote settings, driven by large corporations transitioning to hybrid models.

Compared with other countries, the economic size and level of development of South Africa are relatively backward, however, the amount of pub-

lished paper have proved the significance of conducting research on remote work and employee motivation. South Africa focuses on local challenges and contexts, such as economic inequality and infrastructure limitations. The country's strong academic interest in social sciences and international collaborations also supports research in this field. Besides, South Africa's economic structure includes industries with strong potential for remote work, such as information technology (IT), outsourcing, and financial services. Notably, South Africa holds a significant position in the global Business Process Outsourcing (BPO) industry, becoming a destination for many international companies seeking outsourcing services. Remote work is highly compatible with these industries, which may drive more research on remote work and employee motivation.

The total amount of research paper produced by Spain is less than US and South Africa. However, its research quality is exceptionally high (highest citations per paper). This is likely due to targeted studies on workplace motivation and the country's focus on labor reform and employee well-being, particularly in the context of the EU's work-life balance initiatives.

China's large economic size and rapid digitization during the pandemic created a fertile ground for

remote work studies. However, the research may be relatively new, which explains its low citation impact as it takes time to gain academic recognition globally.

The Netherlands, with its focus on innovation, flexible working policies, and strong academic partnerships, has contributed significantly to research on remote work. Its emphasis on employee satisfaction and sustainability in workplace practices drives research output.

Table 3 – Top 5 productive and influential countries

Rank	Country	Total paper	Total citations	Citations per paper (C/P)	≥50	≥20	≥5	≥1
1	USA	8	86	10.8		2	1	2
2	South Africa	6	38	6.3		1	1	1
3	Spain	4	1	0.3	1	1		2
4	China	4	0	0.0				
5	Netherland	3	41	13.7	□	□	2	1

Note – The result is based on data from Web of Science Core Collection database
 ≥200, ≥100, ≥50, ≥20, ≥10, ≥5 and ≥1 represent number of papers equal to or greater than 200, 100, 50, 20, 10, 5, and 1 citation, respectively.

Analysis of keywords is generally used as an effective method to review the relationship among research topics. It is helpful in discovering research structure and research hotspots by counting the co-occurrence of keywords. In the study, all keywords were selected as statistical objects for keyword analy-

sis. In the analysis, keywords that appeared at least four times are set for analysis. Among all 345 keywords, there are 28 keywords that met the threshold. By using VOSviewer software, Fig. 3 shows the co-occurrence network of the keywords cluster. In addition, Table 4 shows the top 15 keywords occurrences.

Table 4 – Top 15 author keyword occurrences

Rank	Keyword	Cluster	Occurrences	Total Link Strength
1	Motivation	1	22	79
2	Performance	1	19	83
3	Remote work	3	19	68
4	Covid-19	2	14	59
5	Telework	3	9	40
6	Impact	3	9	36
7	Work	3	7	33
8	Resources	1	7	32
9	Intrinsic motivation	2	6	28
10	Satisfaction	1	6	25
11	Remote working	3	6	22
12	Antecedents	3	5	25
13	Workplace	3	5	23

Continuation of the table

Rank	Keyword	Cluster	Occurrences		Total Link Strength
14	Self-determination theory	2	5		19
15	Outcomes	2	4		25

Note – The result is based on data from Web of Science Core Collection database

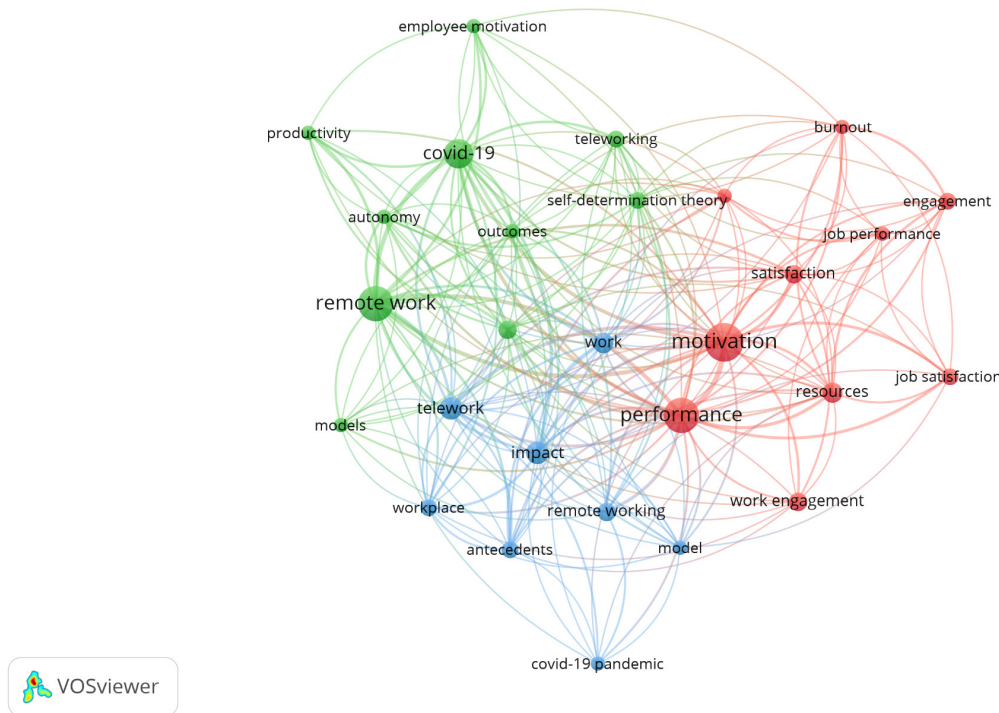


Figure 3 – Co-occurrence network of the keywords cluster
 Note – The result is obtained using the Vosviewer platform

According to the major keywords, the main topics are divided into three aspects: the psychology of employee motivation (red cluster), the role of the COVID-19 pandemic (green cluster), and telework models and organizational impact (blue cluster).

1) The psychology of employee motivation (red cluster)

Employee motivation is a central theme in remote work research, focusing on the psychological and resource-related aspects of performance. Some scholars emphasize keywords like motivation, performance, job satisfaction, engagement, resources, and job performance. These terms represent the critical relationship between individual employee factors and organizational outcomes in a remote setting.

Remote work environments often require strategies to enhance engagement and satisfaction, which in turn improve job performance. The availability of resources, both physical and psychological, plays a pivotal role in maintaining high performance. Frequently co-occurring keywords, such as job satisfaction and resources, highlight the importance of intrinsic and extrinsic motivators for employees.

With the increasing prevalence of remote work, researchers are examining how motivation theories, such as self-determination theory, can be applied to understand employees' behaviors and outcomes. This cluster underscores the need for organizations to focus on personalized motivation strategies, ensuring alignment with individual needs and organizational goals.

2) The role of the COVID-19 pandemic (green cluster)

COVID-19 has fundamentally changed how organizations and employees think about remote work. The pandemic has accelerated the pace at which companies are shifting from traditional to remote work models. It also brings challenges related to autonomy, outcomes, and employee well-being. The high-frequency keywords show this shift in the Cluster analysis, including COVID-19, remote work, autonomy, and self-determination theory.

Remote work during the pandemic highlights the dual impact of autonomy: on the one hand, it promotes flexibility and empowerment, but on the other hand, it may also bring challenges such as social isolation and burnout. As can be seen from keywords such as burnout and outcomes, employee motivation should focus more on striking a balance between autonomy and structured support to mitigate negative effects.

In addition, the pandemic has greatly changed organizational expectations and employee experience. As analyzed previously, intrinsic motivation is playing a more important role. Researchers are increasingly interested in how to explain employees' responses to the pandemic-driven remote work culture through psychological frameworks (such as self-determination theory) and find targeted employee motivation methods.

3) Telework models and organizational impact (blue cluster)

Remote work has become an indispensable working mode in the modern workplace. In order to better adapt to this new working mode, companies need to adjust their organizational structures and practices. The keywords of the blue cluster reflect these changes, including remote work, workplace, model, impact and antecedents.

The blue cluster emphasizes the importance of designing a remote work model that meets employee needs and organizational goals. For example, exploring how antecedents such as workplace culture and leadership affect the success of remote work implementation. The study found that keywords such as model and impact often appear at the same time. This also shows that in order to build an effective remote work model and framework, it is necessary to address not only productivity issues but also employee satisfaction issues.

At the same time, the keywords show that the current research is also designed to explore the broader impact of remote work, such as the impact on workplace dynamics and organizational adaptability. As remote work becomes more and more

mainstream, organizations need to adjust traditional methods and provide employees with a more innovative and inclusive consolidation environment by exploring new employee motivation system.

CiteSpace software is combined in the research to further reveal the trends of remote work and employee motivation.

1) Keyword Frequency Analysis

Through the analysis of keyword frequency, as Table 5 shows, "remote work" (rank 1) and "performance" (rank 2) have the highest frequency, indicating that these are central themes in the research field. Other frequently occurring keywords include "motivation" (rank 3), "impact" (rank 4), and "job satisfaction" (rank 7). Keywords like "Covid-19 pandemic" (rank 10) and "autonomy" (rank 12) highlight the influence of the pandemic on the research direction. The emergence of "Covid-19 pandemic", "Remote work", and "Autonomy" reflects the surge in interest in remote work practices during and after the pandemic. Keywords such as "Job satisfaction", "Work engagement", and "Resources" emphasize the importance of psychological and practical support for remote employees. Keywords like "Hybrid work" and "Adaption strategies" suggest that hybrid work models and organizational flexibility are becoming increasingly relevant.

2) Centrality Analysis

Based on Table 6, it's easy to find that remote work" and "performance" rank highly in centrality, reaffirming their importance as central nodes in the research network. Keywords such as "motivation", "autonomy", and "resources" are significant in linking different research themes, reflecting their integrative role in the field. Emerging concepts like "self-determination theory" and "burnout" appear in the centrality analysis, indicating growing interest in psychological frameworks and mental health challenges associated with remote work.

3) Emerging Trends and Future Directions

Recent keywords like "hybrid work" and "work from home" reflect shifts in organizational practices post-pandemic. The focus on "adaptation strategies" signals a need for practical solutions to remote work challenges. Based on this analysis, this study presents three remote work and employee motivation research trends.

First is the impact of hybrid work models on employee motivation and organizational performance. While remote work has been extensively studied, the hybrid work model—combining remote and in-office work—represents a growing trend that requires further research. Future studies could explore how hybrid work affects employee motivation, col-

laboration, and productivity across various industries and cultural contexts.

For example, some scholars have suggested that the advantages of traditional working mode and remote working mode can be taken into account through hybrid working mode. Then subsequent research can build on this and further study how to balance the relationship between the two, or how hybrid work affects team management and employee motivation. Researchers can focus on whether the effects of different factors on employee motivation have changed under the new hybrid working mode. For example, for multicultural international companies, it is possible to study how cultural differences affect the adoption and results of hybrid working modes, to gain a broader understanding of its global impact.

The second is the psychological and behavioral mechanisms in remote working environments. In remote working environments, due to the increased distance between managers and employees, the psychological state of employees becomes more difficult to detect and grasp. As mentioned earlier, the problems and challenges brought about by remote work are mainly concentrated on the psychological level of employees, so strengthening the understanding of the psychological state of employees is crucial to developing effective new employee motivation methods. Future research can further study

motivational theories such as self-determination theory and study how autonomy, ability and relatedness affect remote workers.

Additionally, studies could focus on the interplay between psychological well-being (e.g., burnout, job satisfaction) and behavioral outcomes, such as employee engagement and retention. Interdisciplinary approaches incorporate insights from different aspects such as psychology, neuroscience, and organizational behavior. It will provide a more nuanced understanding about how to foster long-term motivation and resilience in remote workers.

The third research direction is related to digitalization and modern technology. The industry is promoting the use of modern digital technology to improve employee motivation and increase employee engagement and happiness. The increasing reliance on digital tools for remote and hybrid work provides an opportunity to study their effectiveness and ethical impact. Future research can explore how to use artificial intelligence, machine learning, and digital platforms to improve employee motivation and make employee motivation more personalized and targeted. For example, research can explore the role of digital tools in reducing burnout, improving team collaboration, and promoting inclusion in virtual environments. In addition, research can also be conducted on protecting employee privacy and the ethical use of employee monitoring technology.

Table 5 – Statistical information of top 30 keywords by frequency

Rank	Keyword	Frequency	Centrality	Year	Rank	Keyword	Frequency	Centrality	Year
1	Remote work	18	0.27	2020	16	Engagement	4	0.05	2022
2	Performance	17	0.18	2019	17	Support	3	0.07	2019
3	Motivation	11	0.14	2021	18	Employee motivation	3	0.09	2022
4	Impact	9	0.35	2019	19	Satisfaction	3	0	2024
5	Resources	7	0.16	2023	20	Covid 19	3	0.08	2024
6	Work	6	0.02	2022	21	Telework	3	0	2022
7	Job satisfaction	6	0.22	2018	22	Consequences	3	0.04	2022
8	Remote working	5	0.04	2021	23	Hybrid work	3	0.03	2024
9	Work engagement	5	0.17	2019	24	Meta analysis	3	0.03	2021
10	Intrinsic motivation	5	0.11	2022	25	Employees	2	0	2024
11	Antecedents	5	0.34	2021	26	Benefits	2	0.05	2023
12	Covid-19 pandemic	4	0.27	2021	27	Quality	2	0	2024
13	Autonomy	4	0.16	2021	28	Challenges	2	0.05	2022

Continuation of the table

Rank	Keyword	Frequency	Centrality	Year	Rank	Keyword	Frequency	Centrality	Year
14	Job performance	4	0.06	2023	29	Context	2	0.09	2022
15	Workplace	4	0.03	2019	30	Work from home	2	0.02	2024

Note – The result is based on data from Web of Science Core Collection database

Table 6 – Statistical information of top 30 keywords by centrality

Rank	Keyword	Frequency	Centrality	Year	Rank	Keyword	Frequency	Centrality	Year
1	Impact	9	0.35	2019	16	Job performance	4	0.06	2023
2	Antecedents	5	0.34	2021	17	Engagement	4	0.05	2022
3	Remote work	18	0.27	2020	18	Benefits	2	0.05	2023
4	Covid-19 pandemic	4	0.27	2021	19	Challenges	2	0.05	2022
5	Job satisfaction	6	0.22	2018	20	Remote working	5	0.04	2021
6	Performance	17	0.18	2019	21	Consequences	3	0.04	2022
7	Work engagement	5	0.17	2019	22	Workplace	4	0.03	2019
8	Resources	7	0.16	2023	23	Hybrid work	3	0.03	2024
9	Autonomy	4	0.16	2021	24	Meta analysis	3	0.03	2021
10	Motivation	11	0.14	2021	25	Adaption strategies	1	0.03	2024
11	Intrinsic motivation	5	0.11	2022	26	Work	6	0.02	2022
12	Employee motivation	3	0.09	2022	27	Work from home	2	0.02	2024
13	Context	2	0.09	2022	28	Burnout	2	0.02	2024
14	Covid 19	3	0.08	2024	29	Self-determination theory	2	0.02	2024
15	Support	3	0.07	2019	30	Models	2	0.02	2024

Conclusion

The main purpose of this study is to explore the research trends of remote work and employee motivation during and after the COVID-19 pandemic. The article uses bibliometric analysis methods to search the Web of Science Core Collection database and apply analysis tools such as VOSviewer and CiteSpace for analysis. In this way, the paper constructs a co-occurrence network, identifies research hotspots, analyzes citation patterns, and comprehensively outlines the knowledge development and thematic evolution in this field.

The analysis reveals several key findings. First, since 2020, there has been a significant increase in

publications and citations on remote work and employee motivation. The increase indicates that after the pandemic, researchers and scholars have increased their academic interest in remote work and employee motivation. Through keyword co-occurrence analysis, the study found that the key research topics mainly include mental health, job satisfaction, and autonomy. The paper also further identified the influence of various countries on this research field through citation and publication analysis, and the result shows that United States, South Africa, Netherlands, and China have made particularly outstanding contributions. The analysis highlights central role of “remote work” and “performance” in the research, with emerging trends focusing on hybrid work mod-

els, psychological mechanisms, and the impact of digitalization on employee motivation. Future research could focus on how to make reasonable use of hybrid work systems and address employee mental health issues caused by employee work.

At the same time, this study also has certain limitations. The database studied use data from the Web of Science Core Collection, and only selected relevant disciplines of management, economics, and psychology for research. The database selection is relatively simple, and the types of research only include articles and review articles, which may cause some related research to be ignored. In addition, in the keyword co-occurrence analysis, the research set a high threshold, only keywords that appear at

least four times will be included in keyword analysis, so the overall identification may not be comprehensive enough. Of course, this also provides a direction for other studies and follow-up research. Future research can use other databases for analysis or explore more potential research directions by setting lower threshold in the keyword co-occurrence analysis.

This study provides a comprehensive review of the research on remote work and employee motivation after the epidemic for the academic community and provides a reference for enterprises to optimize employee motivation strategies under the new work mode. Future in-depth research will further enrich the theory and practice in this field.

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Information about authors:

Pei Gao (corresponding author) – PhD student, al-Farabi Kazakh National University (Almaty, Kazakhstan, email: 18698124174@163.com);

Bazhan Turebekova – PhD, Acting Associate Professor of the Management Department at al-Farabi Kazakh National University (Almaty, Kazakhstan, email: turebekova_bo@mail.ru);

Anna Kloczko-Gajewska – PhD, Assistant Professor at Institute of Economics and Finance, Warsaw University of Life Sciences – SGGW (Warsaw, Poland, e-mail: anna_kloczko_gajewska@sggw.edu.pl)

Авторлар туралы мәлімет:

Пей Гао (корреспондент автор) – докторант, әл-Фараби атындағы Қазақ ұлттық университеті (Алматы қ., Қазақстан, электрондық пошта: gao18698124174@gmail.com).

Бажан Түребекова – PhD, әл-Фараби атындағы Қазақ ұлттық университеті (Алматы қ., Қазақстан, электрондық пошта: turebekova_bo@mail.ru)

Анна Клоцко-Гаевска – PhD, профессор ассистенті, Экономика және қаржы институты, Варшава жаратылыстану ғылымдары университеті (Варшава, Польша, электрондық пошта: anna_kloczko_gajewska@sggw.edu.pl)

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