

## TWENTY-FIVE YEARS OF DECENT WORK: A BIBLIOMETRIC ANALYSIS BY CITESPACE

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**Abstract.** Although decent work has been an emerging topic since 1999, existing research lacks systematic and visualized literature reviews. Therefore, we selected 1218 papers on this topic from the Web of Science Core Collection spanning 1999 to 2025, comprising 1465 original papers. We conducted descriptive, collaboration, co-citation, and co-occurrence analyses using CiteSpace. Descriptive analysis indicates a boost in publications since 2021, concentrating on business economics. Collaboration analysis reveals that the United States and the United Kingdom are the leading regions, with the State University System of Florida and the University of London as key contributors. Co-citation analysis shows that the International Labour Organization and Duffy RD are highly co-cited. Co-occurrence analysis reveals that decent work, as part of Sustainable Development Goal 8, is most prominent within environmental science in recent years. Finally, we created a knowledge framework and identified future research directions to inspire researchers based on these findings.

**Keywords:** *Sustainable Development Goal, visualization, framework, PRISMA, workplace*

### Introduction

Decent work (DW) was proposed by the International Labour Organization (ILO) in 1999 to ensure that all workers, regardless of gender, could work in conditions of freedom, equality, safety, and dignity. This is achieved by promoting employment, security, rights, and social dialogue while facilitating three-party dialogue among governments, enterprises, and trade unions. In 2015, the United Nations (UN) included DW as a global Sustainable Development Goal (SDG) for the first time, highlighting its importance in international development. The promotion of DW is significant for governments, enterprises, and workers. For the government, adopting a Decent Work Agenda (DWA) as a social policy can guide labor market strategies and help reduce social inequality while promoting fairness and stability (Dhakal and Burgess, 2021; Jianu et al., 2021). For enterprises, DW fosters employee creativity and enhances organizational performance (Yan et al., 2023a, b). For workers, it boosts the sense of work meaningfulness in their jobs, improves well-being, and supports work-family balance (Blustein et al., 2023; Geng et al., 2024).

Various governments have implemented effective policies to achieve DW, while enterprises have adopted management practices to do the same. At the government level, the Mexican government protects workers' rights through labour market regulation (Murillo, 2005), and Norway's government uses active labor market programs to help vulnerable groups transition from social assistance to self-sufficiency (Lorentzen and Dahl, 2005). At the enterprise level, multinational companies in India incorporate

workforce diversity and provide equal opportunities and inclusive growth for all employees (Khalique et al., 2020). In the Philippines, unionized firms offer equal job opportunities, safe working conditions, and voice right in the workplace through collective bargaining (Edralin and Review, 2016).

In addition, scholars have also conducted extensive research on DW. The research mainly focuses on developing indices and constructing comparison studies among countries at the macro level, while researchers develop scales, construct empirical research, and explore the related factors and interdisciplinary research of DW at the micro level. First, macro-level research on DW has produced indices and indicators, such as the Decent Work Index and statistical measures (Anker et al., 2003; Bonnet et al., 2003). These tools have been used for comparative analyses between developed and developing countries (Bescond et al., 2003). This was the early stage of DW, but its limitations stem from varying macro indicators' statistical specification across countries, raising doubts about research stability. Consequently, scholars shifted their focus to micro-level studies of DW. Second, scholars have utilized work psychology theory (PWT) as a foundation for developing measurement scales at the micro level of DW, such as the decent work scale (DWS) (Duffy et al., 2017), decent work perception scale (DWPS) (Yan et al., 2023), and perceived decent work (PDW) (Saragih et al., 2025) to assess individuals' perceptions of DW. The concept of DW has evolved to include individual perceptions of equality, respect, fairness, and rights. Micro research on DW draws from the interdisciplinary field of economics, management, psychology, and sociology, laying a theoretical foundation for empirical research. Third, empirical research. Empirical research on DW has explored the antecedents, outcomes, mediators, and moderators of DW. Scholars have identified antecedent variables of DW as economic constraints, marginalization experiences, work volition, and career adaptability (Duffy et al., 2020). The outcome variables include health symptoms (Duffy et al., 2021), social status, and career-related outcomes (Wang et al., 2019). The mediating variables include felt obligation and organizational identification (El-Gazar and Zoromba, 2025), work-family conflict (Yan et al., 2025) and work volition (Carkit, 2025), while the moderating variables are instructor support (Wan et al., 2025) and job-person fit (Marcionetti et al., 2025). The latest research examines the mediating role of DW in the relationship between human capital and immigrants' social integration (Cequea et al., 2025). Additionally, some scholars have confirmed the mediating role of DW in the relationship between role clarity and job embeddedness (Carkit, 2025). Fourth, interdisciplinary research on DW has yielded rich results. Scholars have explored it from various perspectives, including the value chain (Reinecke and Donaghey, 2021), ecology (Lee et al., 2020), supply chain (Thomas and Anner, 2023), tourism management (Robinson et al., 2019) and artificial intelligence (Badea et al., 2024; Dalain and Yamin, 2025).

To clarify the current state of research on DW, scholars have reviewed studies published over the past two years. For example, Saragih (2024) conducted a PRISMA-based review of 110 studies on DW in the digital economy, identifying key issues such as digital work transformation, inadequate compensation, and job fulfilment (Saragih et al., 2024). Wang (2024) reviewed 667 studies on DW in the hotel and tourism industry and identified six core clusters, such as labour rights and gender equality, sustainability and health, PWT, conceptualization of DW, marginalized groups and unemployment, and job quality (Wang and Cheung, 2024). Nourafkan (2023) reviewed empirical research on DW from a micro perspective, analyzing its indicators, outcomes, mediators, and moderating variables (Nourafkan and Tanova, 2023). Alisha and Akarsh (2024) reviewed

20 years of DW research using the Scopus database and found only a limited number of studies in middle- and low-income countries, highlighting persistent research gaps. Wang and Sun (2024) conducted a bibliometric analysis of DW literature (2002–2023) in the Web of Science Core Collection (WOSCC), revealing that early research emphasized work willingness, SDGs, and informal employment, while recent work increasingly focuses on resources, climate change, and tourism. Unlike previous reviews, this study emphasized the theoretical model of DW, offering insights for scholars to pursue empirical research.

In conclusion, scholars have increasingly focused on DW research. Current studies have explored its definition, measurement tools, related factors, and interdisciplinary aspects, yielding valuable insights for further investigation. However, these studies are scattered and focused on specific interdisciplinary fields, lacking a comprehensive review and summary of future research trends in DW literature. This hinders researchers' understanding of the theoretical basis, development process, status, and future directions of DW. In conclusion, this manuscript focuses on the following research questions:

1. What is the basic knowledge of DW?
2. How do participants interact on DW?
3. What is the status of research on DW?
4. What is the future research implication of DW?

To address these questions, we employed the bibliometric visualization software CiteSpace to analyze 25 years of literature on DW. (1) Through statistical analysis of publication year, journals, and categories, we examined the development and themes of DW. (2) By analyzing author, institution, and regional collaboration statistics, we mapped interactions among participants and identified key collaborating authors, institutions, and active regions. (3) We conducted statistical analysis on co-citations of authors, journals, and references to outline the current research status. By analyzing the co-occurrence of categories, keywords, and keyword bursts, we identified current research hotspots and their duration, helping readers grasp the key areas scholars focus on. (4) Based on this statistical data, we established a knowledge framework that presents core conclusions for each section and highlights future research directions in DW.

The paper is organized as follows: Section 1 introduces the background, significance, and research content. Section 2 discusses the research method and data screening process. Section 3 presents the main research content, including feature, collaboration, co-citation, and co-occurrence analyses. Section 4 outlines the theoretical framework, covering the knowledge framework, future research trends, theoretical implications, and practical implications. The final section concludes key findings, limitations, and future directions for research.

### ***Materials and methods***

To standardize the research, we followed the PRISMA guidelines (Page et al., 2021), which included criteria establishment, database selection, article search, article selection, and analysis tools and data analysis.

### ***Criteria establishment***

Before conducting the research, we discussed the criteria for selecting the topic. We established the following standards: First, articles must come from representative core

databases worldwide; second, articles should be research papers or reviews related to the topic; third, the time is from January 1, 1999, to December 31, 2024, when DW was proposed in 1999; fourth, selected papers must be analyzable using bibliometric software.

### ***Database selection***

We selected the Science Citation Index Expanded (SCIE), Social Sciences Citation Index (SSCI), and Arts & Humanities Citation Index (AHCI) from the global academic database WOSCC for data collection. These databases include numerous high-quality, acclaimed academic papers, which are peer-reviewed publications. The reasons for choosing these databases are as follows: First, articles from these databases are widely cited by researchers globally, indicating a strong impact; second, the selected articles are more authoritative, enhancing the analysis's credibility; third, these databases host a vast number of papers. The reasons for excluding EI/SCOPUS are as follows: First, the analysis software struggles with comprehensive cross-database analysis; second, there is overlap between articles in EI/SCOPUS and WOSCC, leading to potential double-counting that could undermine data credibility.

### ***Article search***

When collecting articles, we must clearly define the topic and its relevance. To filter articles effectively, we have established the following criteria: (1) Topic = ([decent NEAR/2 work\* or decent NEAR/2 labour\* or decent NEAR/2 job\*]). All criteria reflect the topic of decent work. (2) Language = "English". (3) Document type = ["Article" or "Review"]. (4) Time period = January 1, 1999, to December 31, 2024. The year 1999 is significant as it marks the International Labour Organization Conference, where DW was first proposed, initiating research in this area. Based on these criteria, we identified 1465 papers.

### ***Article selection***

We applied the back-to-back principle to screen 1465 papers in accordance with PRISMA guidelines. The first step involved title screening, where two management experts reviewed the titles and excluded incomplete or duplicate entries. The second step involved abstract screening. Two experts from Shanghai Dianji University independently reviewed the abstracts of 1465 papers to assess their relevance to DW. In cases of differing opinions, a third expert from Shanghai Ocean University was invited to finalize the relevance. Ultimately, 1218 papers were selected. The third step involves main text screening, where two experts from Shanghai Dianji University reviewed the texts of all 1218 documents to assess their relevance to the topic. It was confirmed that all papers pertained to DW. The fourth step is data import. We imported the 1218 papers into CiteSpace and retained them after software screening. The process is shown in *Figure 1*.

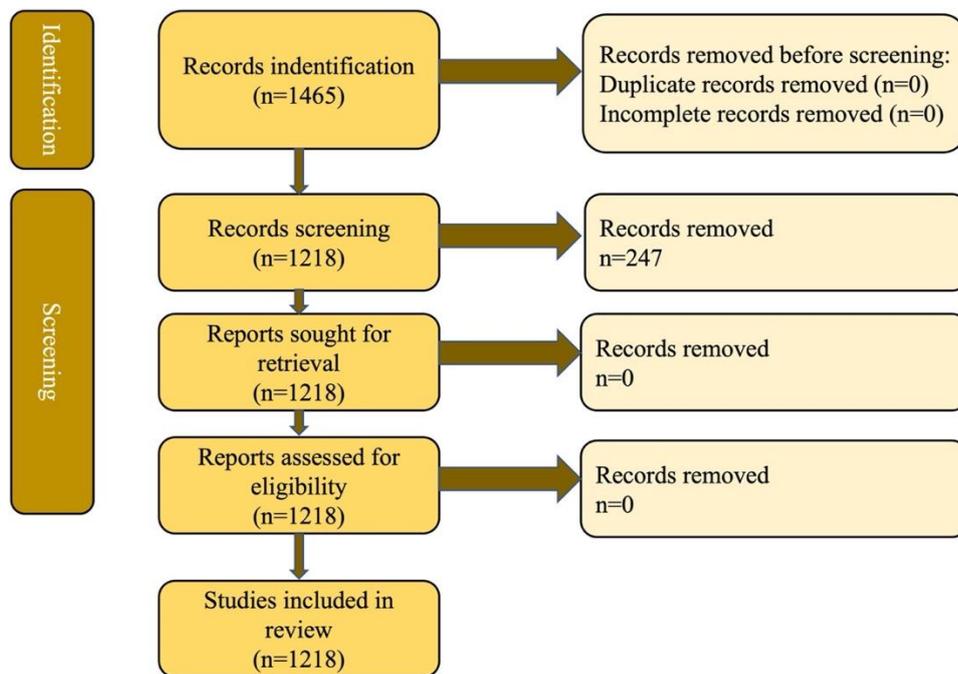
### ***Analysis tools***

This study uses a visualized bibliometric analysis to comprehensively summarize DW's progress. Compared to existing methods, our approach offers several advantages:

1. It provides key insights from essential information such as authors, institutions, regions, sources, topics, and categories for a multidisciplinary understanding of the theme.

2. It allows for quantitative analysis of numerous high-quality publications to represent current studies objectively.
3. It highlights frontiers and hotspots in the field to identify potential future research trends and characteristics.

Bibliometric analysis employs mathematical and statistical principles along with quantitative models to highlight research trends and status in a specific field (Pan et al., 2019; Ding and Yang, 2022; Phoong et al., 2022). Visualizing knowledge maps enhances the clarity and appeal of bibliometric results. Some software is available for this purpose, including COOC, VOSviewer, CiteSpace, and CiteNet. Each tool has its pros and cons. For example, COOC lacks citation analysis capabilities, CiteNet cannot create co-occurrence matrices, and VOSviewer has a less user-friendly interface (Geng and Maimaituexun, 2022). In contrast, CiteSpace offers citation analysis with an intuitive interface while effectively integrating visualization technology with bibliometrics. It also includes clustering and keyword-burst functions to analyze the evolution of hotspots and research frontiers within a particular theme (Wu et al., 2019; Geng et al., 2024).



*Figure 1. Data identification and screening according to PRISMA*

### **Data analysis**

The main procedures of this study are as follows.

1. Descriptive statistical analysis. We evaluate DW's annual growth rate, key journals, and main categories over the past 25 years to gauge its popularity.
2. Collaboration analysis. We analyze collaboration among institutions, authors, and regions to illustrate participants' interactions in this field and the correlation between research outcomes.
3. Co-citation analysis. We conduct journal, reference, and author co-citation analyses to highlight the current state of DW research.

4. Co-occurrence analysis. We perform a co-occurrence analysis of keywords and categories to outline dynamic developments and conduct keyword bursts to illustrate the potential hotspots and future trends.
5. Knowledge framework. Finally, we create a comprehensive knowledge framework to identify research hotspots and directions in this field.

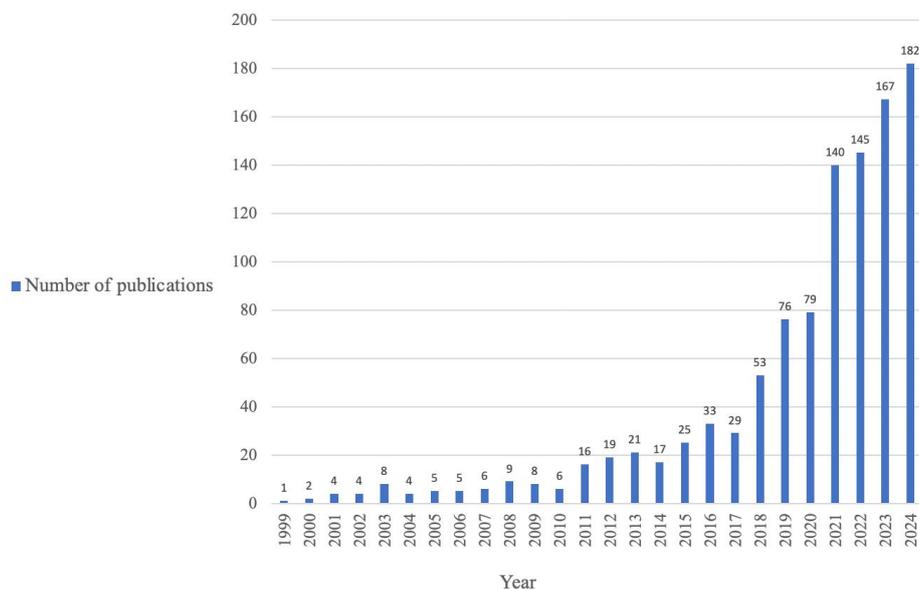
## Results

This section analyzes publications since DW was proposed, including the number by year, journal, and category. Additionally, we examine recent trends in this field.

### *Publication statistical analysis*

#### *Number of publications by years*

The number of DW publications is shown in *Figure 2*. Since its introduction in 1999, this topic has gained significant scholarly attention, with publication growth occurring in three stages.



**Figure 2.** *Number of publications over the years*

The first stage (1999-2010) was the nascent phase, during which 62 papers were published, accounting for 5.82%. Despite the limited number of publications and their slow growth at this stage, scholars engaged in discussions of relevant labour policies related to DW. For instance, representative papers in the “International Labour Review” have explored how to develop economic, social, and regulatory policies to enhance the feasibility of DW (Fields, 2003; Servais, 2004). These early papers established a theoretical foundation for future research and indicated that DW studies were gaining significant academic attention.

The second stage is the development stage (2011-2020), during which 368 papers were published, accounting for 34.55%. Compared to the nascent stage, publications in this period increased steadily. The research focused on country-specific and group-specific

studies on DW. Notable country-specific studies assessed DW levels in countries like Thailand (Suttawet and Bamber, 2018), Japan (Kubo, 2018), and Nepal (Raj et al., 2012), establishing an index system for comparative analysis among nations (Ostermeier et al., 2015; Sanhokwe and Takawira, 2023). Group-specific studies examined low-income and marginalized populations, such as the stripping group in the UK (Cruz et al., 2017), individuals without a college education in Brazil (Ribeiro et al., 2016), and Sexual Minority Populations (Allan et al., 2019). They developed a scale based on the PWT (Duffy et al., 2016; Duffy et al., 2017) and validated it within Turkey's working group (Isik et al., 2019). Creating measurement indicators and tools during this stage provided a theoretical foundation for studying factors influencing DW.

The third stage is the explosive stage (2021-present), during which 634 papers have been published, representing 59.53% of total publications. This indicates a growing academic interest in DW research. In this stage, the focus has shifted from macro-level country and policy analysis to micro-level individual perceptions, emphasizing the development of measurement tools and the exploration of antecedent and outcome variables of DW. Specifically, scholars developed the DWS in hospitality (Ferraro et al., 2021), the DWPS (Yan et al., 2023), and a measurement model for DW based on grounded theory. Extensive research has been conducted on the antecedents and outcomes of DW using these tools. Findings indicate that subjective social status and a disadvantaged mindset significantly predict DW (Wen et al., 2023), with outcomes including job satisfaction and turnover intention (Aybas et al., 2022; Namal et al., 2024). Micro-level research attracts attention from psychology, organizational behavior, management, and economics, fostering interdisciplinary studies on DW.

#### *Number of publications by journals*

Table 1 lists the top 10 journals that have published the most papers on DW. Over the past 25 years, more than 200 journals have published articles related to DW. As for disciplinary distribution, the journals publishing on this topic primarily belong to psychology, environmental science and ecology, and economics. Notably, psychology journals such as "Journal of Career Assessment" and "Journal of Vocational Behavior" indicate a strong interest in DW within this field. Additionally, three environmental science and ecology journals highlight significant cross-disciplinary research on DW and sustainable development among scholars. As for journal publication, "Sustainability" has the highest publication count at 121 papers, representing 11.36% of the published works. This may be attributed to DW being the 8th goal of the UN's SDGs, which has garnered considerable attention in sustainable research. As a leading journal, "Sustainability" emphasizes ongoing research developments.

#### *Number of publications by categories*

Table 2 lists the top 10 categories on DW. The articles are primarily from business economics, environmental ecology, psychology, and science and technology, with 168 publications in business economics, 149 in environmental science and ecology, 118 in psychology, and 115 in science and technology (accounting for 15.77%, 14%, 11.08%, and 10.80% respectively). These fields represent over half (51.65%) of the top ten categories. The categories span multiple disciplines, including public environmental, occupational health, development studies, engineering, government and law, public administration, and sociology-collectively accounting for 22.17% of the top 10. This

highlights DW's experience at interdisciplinary intersections and suggests that cross-disciplinary research is a promising future direction.

**Table 1.** Publications by journals

Ranking	Journals	5-year IF	Count	Percentage
1	Sustainability	3.6/Q2	121	11.36%
2	International Labour Review	2.2/Q1	56	5.26%
3	Journal of Career Assessment	3.8/Q2	36	3.38%
4	Journal of Vocational Behavior	9.4/Q1	31	2.91%
5	Frontiers in Psychology	3.3/Q2	28	2.63%
6	International Journal of Environmental Research and Public Health	4.8/Q2	20	1.88%
7	Journal of Cleaner Production	10.2/Q1	20	1.88%
8	Economic and Labor Relations Review	1.9/Q2	17	1.60%
9	Journal of Counselling Psychology	4.9/Q1	17	1.60%
10	British Journal of Guidance Counselling	1.3/Q4	14	1.31%

**Table 2.** Publications by topics

Ranking	Categories	Count	Percentage
1	Business Economics	168	15.77%
2	Environmental Science Ecology	149	14.00%
3	Psychology	118	11.08%
4	Science Technology	115	10.80%
5	Public Environmental Occupational Health	55	5.16%
6	Development Studies	54	5.07%
7	Engineering	45	4.23%
8	Governmental Law	38	3.57%
9	Public Administration	22	2.07%
10	Sociology	22	2.07%

### **Collaboration analysis**

This section provides detailed information on the collaboration in DW, including institution, region, and author collaboration. These analysis results will offer researchers ideas for seeking future collaboration opportunities.

#### *Institution collaboration network*

Table 3 presents the top 10 institutions collaborating in this field, with the first collaboration year in the year column. DW has gained significant attention in Europe, America, and Africa. The detailed findings are as follows.

Six institutions from the United States highlight significant attention to DW research. The leading collaborative institution is the State University System of Florida, with 38 collaborations and the highest centrality among the top ten at 0.06. Three European institutions are the University of London (UK), the Universidade de Lisboa (Portugal), and the University of Florence (Italy). Notably, the University of London ranks third with 26 co-authored papers and a centrality score of 0.06. The influential works from this institution emerged in 2001, just three years after DW was proposed, indicating that the

University of London had already begun impactful research in this field. One institution from Africa is the Egyptian Knowledge Bank, Egypt’s national digital library. It has published 14 papers collaborating with other institutions, with significant research results emerging since 2018.

Notably, in sustainable development research, the collaboration centrality of the top ten institutions ranges from 0.01 to 0.09 (Geng and Maimaituerxun, 2022; Geng et al., 2024). Within this field, the centrality of these institutions ranges from 0.01 to 0.06, indicating that collaboration on DW in sustainable development needs improvement. Institutions with existing collaborations should enhance cross-regional collaboration, while those not yet engaged internationally should actively seek partnerships with influential institutions and universities.

**Table 3.** *Institution collaboration network*

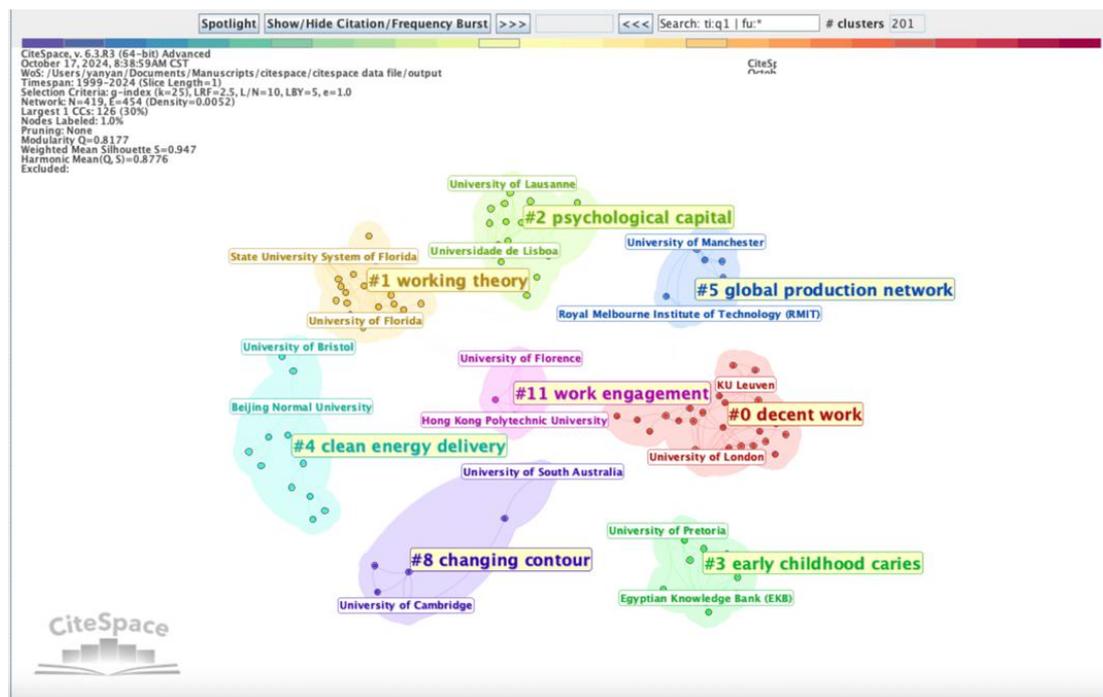
Ranking	Institution	Country	Count	Centrality	Year
1	State University System of Florida	USA	38	0.06	2017
2	University of Florida	USA	34	0.02	2017
3	University of London	UK	28	0.06	2001
4	Boston College	USA	23	0.01	2016
5	Purdue University	USA	17	0.04	2008
6	Perdue University System	USA	17	0.04	2008
7	Universiade de Lisboan	Portugal	15	0.02	2018
8	University of Wisconsin System	USA	14	0.00	2019
9	Egyptian Knowledge Bank	Egypt	14	0.02	2018
10	University of Florence	Italy	13	0.01	2016

*Figure 3* presents the institutional collaboration, with 419 nodes, 454 links, and 8 clusters. These institutions conduct research on DW in different themes.

Clusters 1#, 2#, and 11# focus on DW’s theoretical studies and empirical research. Cluster 1# emphasizes the theoretical studies. The institutions collaborating extensively are the University of Florida and the State University System of Florida. The University of Florida and Texas Tech University jointly published an article on changes in DW across time, grounded in the PWT. The study identified five latent DW profiles: safety, low healthcare, indecent work, average, and DW, of which the first two are most susceptible to change over time. These findings suggest that psychological factors may mediate the acquisition and maintenance of DW through distinct pathways (Park, J., et al., 2024). Clusters 2# and 11# concentrate on empirical studies. Cluster 2# (psychological capital) investigates the link between DW and psychological capital, exemplifies the mediating and moderating variables between DW and psychological capital for knowledge workers (Ferraro et al., 2018a, b). This research originated from a collaboration among five institutions: the University of Lisbon, the University of Coimbra, and the University of Évora from Portugal, the University of Salzburg from Austria, and the University of Notre Dame from the USA. Cluster 11# (work engagement) examines the influential factors underlying the relationship between work engagement and DW. A collaborative study from Hong Kong Polytechnic University, Universidad Internacional de Andalucía and Sejong University found that poor working conditions negatively affect employee engagement, underscoring the need for managers

to enhance work quality to improve DW among knowledge workers (Ariza-Montes et al., 2021).

Clusters 0# and 5# focus on interdisciplinary research of DW, supply chains, and production networks. Cluster 0# examines the intersection of DW and supply chains. A joint study by the University of London and the University of South Australia introduces “worker-driven supply chain governance,” promoting workers’ democratic participation in supply chains. By integrating DW with supply chain management, it offers inspiration for scholars to conduct interdisciplinary research (Reinecke, J., et al., 2021). Cluster 5# investigates the relationship between DW and global production networks. For example, a collaborative study from the University of Manchester, Duke University, University of North Carolina, and international labour organization highlights that international production networks pose challenges to DW and employment (Barrientos et al., 2011a).



**Figure 3.** Visualization of institution collaboration network

Research on the relationship between DW and economic development (Clusters 4#, 8#, and 3#) reveals distinct focuses. Cluster 4# emphasizes clean energy delivery. For example, Beijing Normal University and University of Victoria highlights that achieving the SDGs requires attention to the link between DW and economic growth in resource-scarce regions such as the Loess Plateau in China (Li et al., 2021). Cluster 8# examines the evolving landscape of industrial relations. Collaborative research in this cluster indicates that DW has influenced industrial relations by adopting an inclusive approach that addresses conflicting interests while integrating economics, politics, and sociology for a comprehensive analysis (Sen, 2013). Cluster 3# investigates the relationship between DW and early childhood caries. A collaborative study from 15 institutions notes that while current literature does not establish a direct connection between early childhood caries, economic development, and DW, there may be complex interrelations among these factors warranting further exploration (Foláyan et al., 2024).

In conclusion, various institutions emphasize different aspects of DW and have collaborated on their research topics, yielding influential results. We therefore advocate broader academic collaboration among institutions to improve the integration of research themes in this field.

#### *Region collaboration network*

Table 4 lists the top 10 regions by number, centrality, and first year of regional collaboration. Europe, Asia, North America, South America, Oceania, and Africa are leading regions, highlighting that DW research is a global issue garnering increasing attention and collaboration worldwide. The main features are as follows.

The United States has had an early start and has had extensive regional collaboration with DW. It began collaborating in 1999, making it the first country to engage in this research after DW was proposed. The U.S. leads in both centrality (0.39) and the number of collaborative papers (237). European countries began regional collaboration in 2000, with the UK being the earliest and ranking first among European nations. Collaboration among Asian countries on DW research started late but has been extensive. China's collaboration began in 2016, the latest among all nations, yet it has a centrality of 0.14 and 121 collaborative papers, indicating significant influence. Despite starting relatively late, the development is rapid. This may be attributed to DW being one of the SDGs that attracts considerable interest from the governments of both countries.

**Table 4.** *Region collaboration network*

Ranking	Regions	Count	Centrality	Year
1	USA	237	0.39	1999
2	England, UK	163	0.35	2000
3	People's Republic of China	121	0.14	2016
4	Australia	102	0.10	2009
5	Spain	70	0.12	2011
6	Italy	70	0.11	2003
7	South Africa	50	0.02	2012
8	Switzerland	50	0.11	2001
9	India	46	0.07	2007
10	Brazil	45	0.09	2009

Figure 4 shows 6 clusters of regional collaboration on DW, with 113 nodes and 581 links. The 6 clusters present different characteristics.

Clusters 0#, 4#, and 5# focus on group research. In cluster 0# decent work, scholars from Spain and the UK studied tourism workers, finding that the broad definition of DW complicates comparative studies across different groups (Sen, 2013). They suggest measuring DW for tourism workers by emphasizing dignity (Winchenbach et al., 2019). In cluster 4#, research on early childhood caries highlighted the importance of DW in healthcare promotion, with significant collaboration between Canada and South Africa. A Canadian study indicated that providing decent working conditions for skilled professionals is crucial for developing comprehensive healthcare facilities, a key component of universal health coverage (Corvalan et al., 2020). Cluster 5# examined Sub-Saharan African countries, focusing on youth facing limited educational

opportunities and high unemployment rates. Governments have implemented active labour market policies to enhance their DW, including oil-related skills training for young people (Darkwah, 2013).

Cluster 3# focuses on empirical research on DW, grounded in the PWT. American scholars developed a research framework for DW based on PWT (Duffy et al., 2021), while Swiss researchers demonstrated that the school-to-work transition process supports achieving DW (Masdonati et al., 2022).

Cluster 1# focuses on DW as a Sustainable Development Goal (SDG). Scholars from China, India, and other regions have examined the impact of human resource management practices on DW within the context of the SDGs. Findings suggest that green, sustainable human resource management enhances DW achievement (Agarwal et al., 2022; Liu et al., 2022).

Cluster 2# focuses on interdisciplinary research on DW and the blue economy, emphasizing sustainable economic activities that align with the capacities of marine ecosystems. Key regions include Italy and Australia. Italian scholars have shown that the circular economy can shift the “use it once and throw it away” towards sustainability by mimicking natural circulation systems (Puntillo, 2023; Duffy et al., 2024). In summary, researchers across various regions study DW based on their local resources and development priorities, reflecting regional characteristics and global trends in DW research.

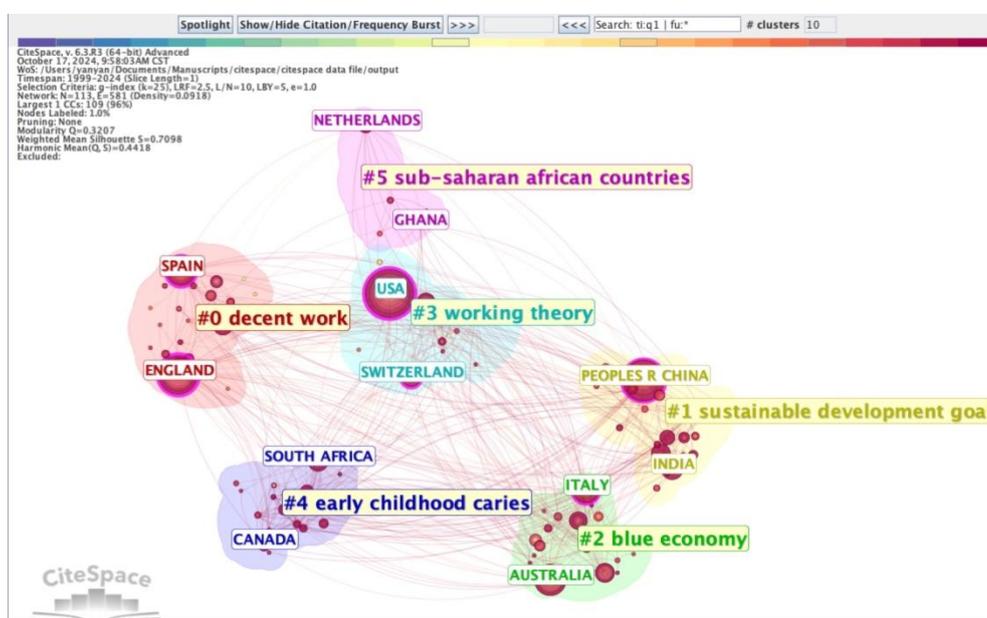


Figure 4. Visualization of region collaboration network

#### Author collaboration network

Table 5 lists the top 10 active collaborative authors in DW. The most collaborative authors are also the most influential. “Count” refers to the number of collaborative publications, and “Year” indicates the year of the first collaboration. The findings are as follows.

Highly collaborative authors have published more papers, with the top 10 contributing 128 papers on DW, about 12.02% (128 out of 1065). Notably, Duffy, the leading

collaborator with 31 papers in the past decade, focuses his research on PWT, developing DWS based on this theory (Duffy et al., 2017) and exploring the relationship between DW and work meaningfulness within this framework (Allan et al., 2019, 2020). Allan, the second-ranked co-author, studies “precautious work” and examines its characteristics across different historical contexts and its relationship with DW (Allan et al., 2021; Allan and Blustein, 2022; Blustein et al., 2023). In summary, the authors collaborate on DW by researching the intersection of psychology and management, developing measurement tools based on PWT, and exploring the connections between DW, work meaningfulness, and “precautious work.”

**Table 5.** Author collaboration network

Ranking	Authors	Institution	Count	Year
1	Duffy, Ryan D	University of Florida	31	2016
2	Allan, Blake A	University of Houston	20	2017
3	Blustein, David L	Boston University	17	2016
4	Autin, Kelsey L	University of Wisconsin Milwaukee	16	2016
5	Kim, Haram J	Texas Tech University	14	2019
6	Di Fabio, Annamaria	University of Florence	11	2016
7	Rossier, Jérôme	University of Lausanne	6	2021
8	Ariza-montes, Antonio	Universidad Loyola Andalucía	5	2019
9	Baek, Seonguk	Yonsei University	5	2023
10	Douglass, Richard P	University of Minnesota	5	2017

Figure 5 illustrates the author’s collaboration network, comprising 537 nodes and 463 links divided into three clusters. The characteristics of each cluster are as follows.

The representative co-author of cluster 0# (working perspective) is Kim Haram J., who studies DW among various groups within the PWT framework. His latest collaboration with Duffy Ryan D validated DWS among Turkish employees, supporting all propositions except work volition (Kim et al., 2025). He also compared predictive factors of DW between college students in South Korea and the United States, revealing that economic resources can significantly predict work volition, occupational participation, and future DW cognition among US college students, but this was not observed in the South Korean sample (Kim et al., 2020). These studies establish a research framework for DW based on PWT, expanding its exploration in psychology.

The representative collaboration author of cluster 1# (year post-graduation) is Blustein David L, Di Fabio, and Svicher Andrea, focusing on the relationship between DW and work meaningfulness. The collaborative research of Blustein and Kenny examined how high school graduates achieve DW through constructing work meaning, marking an initial exploration into this relationship (Kenny et al., 2016). The latest paper, published in 2023, identifies need satisfaction as a bridge connecting DW and work meaningfulness, as proposed by Blustein and Duffy (Blustein et al., 2023).

The representative collaborative authors of cluster 3# (qualitative research) is Aisenson Gabriela, Rossier Jérôme and Masdonati Jonas. The collaborative research of these three authors examines quantitative studies of DW, primarily focusing on emerging adults (Cohen-Scali et al., 2022). It is found that job stability and positive workplace relationships influence representation. However, vulnerable young Argentine workers

often accept precarious jobs due to unstable employment conditions and limited quality job opportunities, leading to reduced representation (Aisenson et al., 2022). In summary, future research could explore DW through psychological frameworks across various groups using quantitative methods to investigate its relationships with different variables.

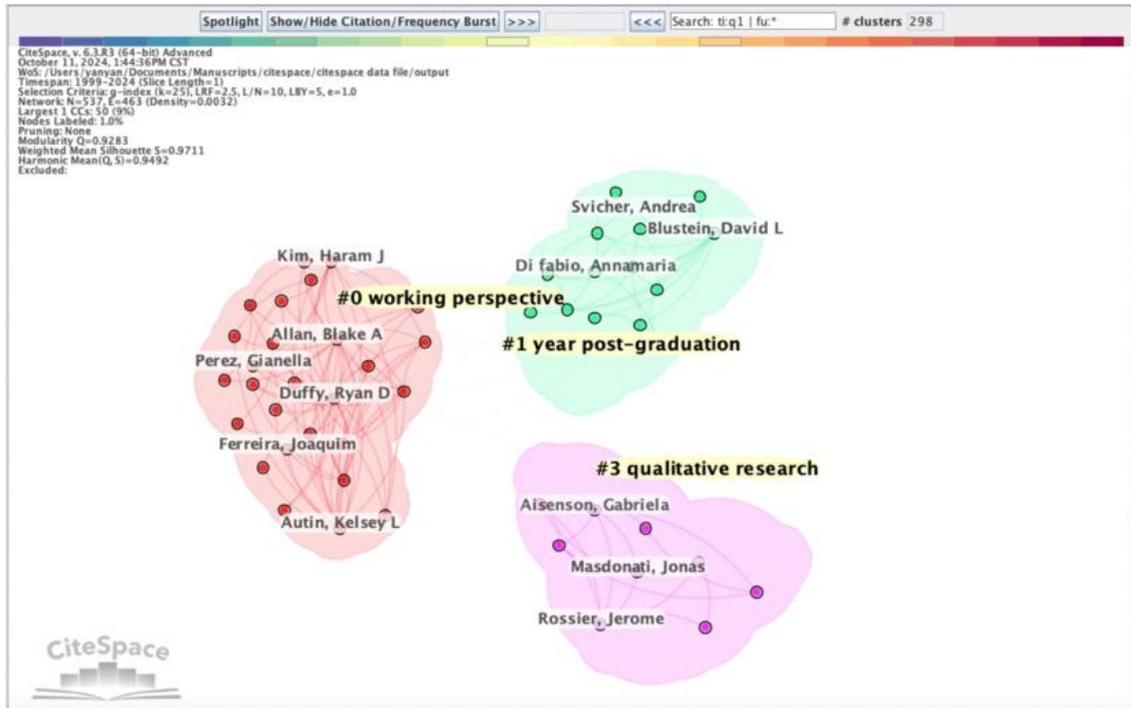


Figure 5. Visualization of author collaboration network

### Co-citation analysis

The co-citation analysis section examines how recent research cites past achievements. This chapter will perform statistical analysis in three areas: journal co-citation, reference co-citation, and author co-citation.

#### Journal co-citation network

Journal co-citation analysis reveals frequently cited journals in DW research. Table 6 lists the top 10 journals ranked by citation frequency. Most co-cited journals are high-quality, with 8 in the Q1. The year indicates when the journal was first co-cited. The analysis of the co-cited journals is as follows.

First, the most frequently co-cited journal is not always the most influential. For example, Sustainability was co-cited 250 times but had a low centrality of 0.02, indicating that, while it published many papers on DW, its influence is limited. Recent studies from Sustainability examine how business models and listed companies' performance affect DW, such as the impact of circular economy models on SDG 8 (decent work and economic growth) (Puntillo, 2023) and the focus on DW and economic development (53%) through integrated reporting quality of listed companies (Hamad et al., 2023).

Second, "World Development" is the most influential journal in this field. Although it has a citation count of 169, its centrality is the highest at 0.30, indicating significant influence. In contrast, the centrality of the other nine top journals ranges from 0.02 to

0.07, highlighting its superior impact. This suggests that papers published in World Development may be few in quantity but high in quality. The most co-cited paper argues that enhancing positions within enterprise value chains and global production networks is crucial for advancing economic and social development (Barrientos et al., 2011b), and has been cited 556 times.

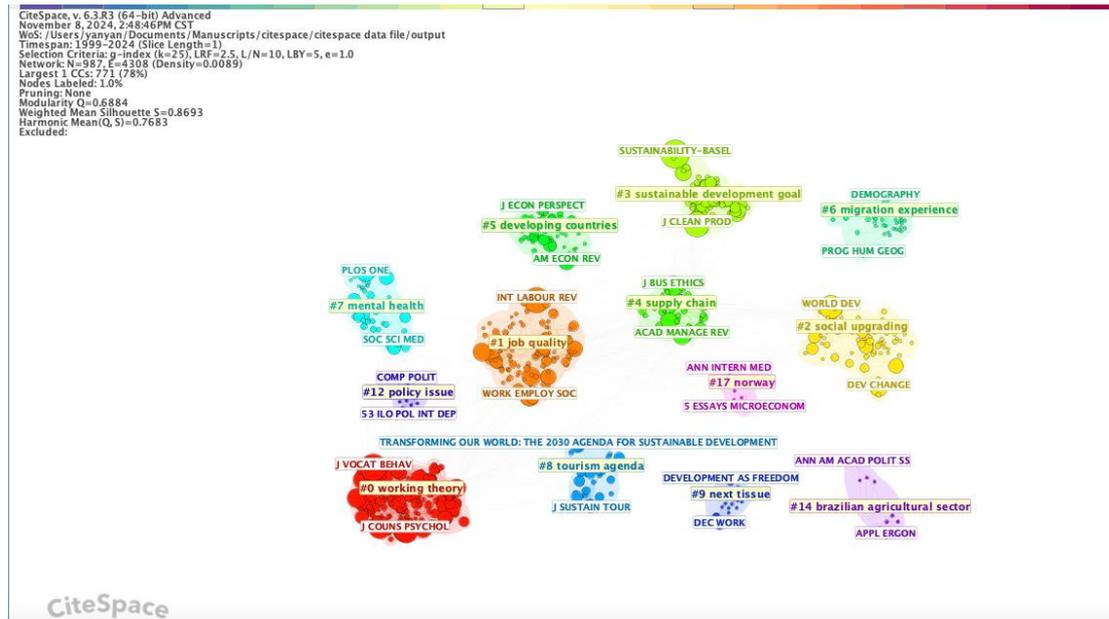
**Table 6.** Journal co-citation network

Ranking	Journals	5-year/IF	Count	Centrality	Year
1	Sustainability	3.6/Q2	250	0.02	2018
2	Journal of Vocational Behavior	9.4/Q1	229	0.04	2014
3	International Labour Review	2.2/Q1	209	0.04	2003
4	Journal of Cleaner Production	10.2/Q1	188	0.03	2015
5	Journal of Counseling Psychology	4.9/Q1	184	0.02	2016
6	World Development	6.5/Q1	169	0.30	1999
7	Journal of Career Assessment	3.8/Q2	168	0.02	2016
8	Journal of Applied Psychology	11.2/Q1	165	0.07	2012
9	Frontiers in Psychology	3.3/Q1	163	0.03	2016
10	Journal of Business Ethics	8/Q1	126	0.02	2015

Figure 6 illustrates the visualized clustering of journal co-citations, highlighting scholars' research interests in DW, with 987 nodes and 4308 links. These clusters represent various themes related to DW research.

Clusters 12#, 14#, and 17# focus on DW policymaking research. The largest node in cluster 12# is Comparative Politics, where a representative co-cited paper found that political parties facing uncertainty adopt labour market regulations to retain supporters (Ribeiro et al., 2016). In cluster 14#, the journal with the highest co-citation is Applied Ergonomics, which features a study showing that organizational support enhances home-based workers' well-being by improving work happiness and reducing psychological stress (Bentley et al., 2016). Cluster 17# examines DW policymaking in Norway, highlighting a study that shows Norway's active labour market program helps vulnerable groups transition from social assistance to self-sufficiency (i.e., work and a decent income) (Lorentzen and Dahl, 2005).

Clusters 0# and 9# focus on the theoretical framework of DW. Cluster 0# is the largest, with 149 nodes, and focuses on theoretical research related to DW. The Journal of Vocational Behavior stands out as the key journal in this cluster, emphasizing a research framework for DW grounded in PWT and addressing job instability and meaning. Notably, it develops a job instability model encompassing three dimensions: precarity of work (instability due to uncertainty), precarity at work (discrimination and safety hazards), and precarity from work (inadequate income for basic needs) (Allan et al., 2021). Additionally, it presents a work meaning model that includes high-quality job opportunities, strong interpersonal relationships, and pathways to DW (Lysova et al., 2019). Cluster 9# centers on the research framework for DW. It features this cluster's largest node and introduces micro and macro measurement frameworks. While previous frameworks primarily applied to the informal economic sector, the one proposed here extends its applicability to various sectors and industries (Nizami and Prasad, 2017).



**Figure 6.** Cluster visualization of journal co-citation network

Cluster 1#,5#,6# and 7# focuses on employment quality. The International Labour Review is the most cited journal in Cluster 1#. Research from this journal indicates significant differences in paid and unpaid care among informal workers of different genders (Ogando et al., 2022). Cluster 5# addresses employment issues in developing countries, with the Journal of Economic Perspectives as a key source. Studies show that while machine replacement may cause short-term technological unemployment and increase inequality, it can ultimately benefit labor market development in the long run (Mokyr et al., 2015). Cluster 6# addresses the employment challenges faced by domestic workers. The most frequently co-cited journal in this cluster is Demography. Research indicates that to manage unpaid domestic work and childcare, mothers often take part-time jobs or leave the labour market to become full-time homemakers when their children are young. As children grow, mothers gradually reduce family responsibilities and seek more employment opportunities. However, their long absence from the labour market complicates re-entry, highlighting the need for focused research on this group’s employment issues (Bianchi, 2000). Cluster 7# examines the impact of mental health on employment. The most co-cited journal in this cluster is PloS ONE. Findings from this journal reveal that during COVID-19, American college students experienced significant psychological distress, affecting their studies and overall well-being. Students with higher depression levels struggled more with future employment concerns (Kecojevic et al., 2020).

Cluster 2#, 3#, 4#, and 8# focus on interdisciplinary research. Cluster 2# specifically examines the cross-disciplinary aspects of DW and social upgrading. The most frequently co-cited journal is World Development. A key finding from this journal is that, under the fast-fashion model, economic upgrading can lead to social upgrading for some workers and social downgrading for others (Rossi, 2013). Cluster 3# is the SDG. In 2015, the United Nations adopted 17 SDGs, with DW as the 8th goal. Notable research from Sustainability indicates that consumers view “decent working conditions” and “access to healthy and safe food” as key aspects of sustainable development. This research advances the study of DW’s role in sustainability and offers new insights for cross-research between DW and marketing

(Peano et al., 2019). Cluster 4# examines the link between DW and supply chains, with the Journal of Business Ethics being a key co-cited source. Recent research indicates that it is crucial to focus on disputes, power dynamics, and legitimacy in labour governance to understand why the ILO has struggled to address DW deficits in global supply chains. The power imbalance among governments, employers, and workers, along with rising anti-hegemonic competition and challenges to the legitimacy of opposing views, contribute to low levels of DW (Thomas and Anner, 2023). Cluster 8# explores the relationship between tourism agendas and DW. The Journal of Sustainable Tourism is a prominent co-cited journal in this area. Research highlights that job insecurity in the tourism industry exacerbates social divisions and economic inequality in capitalist economies (Robinson et al., 2019). Scholars should explore solutions to employment instability in tourism to support the achievement of SDGs in the future.

### Reference co-citation network

Reference co-citation analysis reveals frequently cited literature. Table 7 lists the top 10 most cited works in DW, primarily published between 2016 and 2019, during a period of steady publication growth (see Fig. 2). The years in the table indicate when each reference was first co-cited. All top references have citation counts exceeding 39, but their centrality is below 0.04, indicating high citation numbers with low influence.

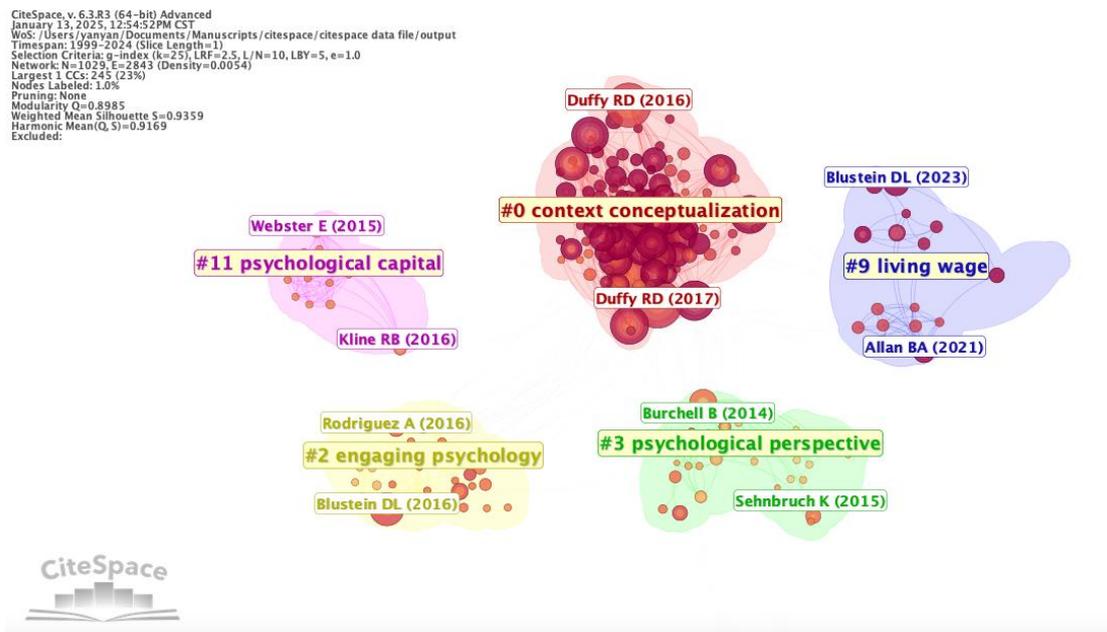
Duffy RD's paper in 2016 has the highest centrality at 0.04. It was the first to integrate occupational psychology, multicultural psychology, intersectionality, and sociology of work into DW's theoretical framework, constructing the PWT and defining DW as core variables within this theory (Duffy et al., 2016). This laid a theoretical foundation for micro-level research on DW. The most frequently co-cited paper is Duffy RD's 2017 study. This paper developed a DW scale comprising 15 items based on the job demands-resources theory (Duffy et al., 2017), providing a tool for measuring and comparing DW. A key study by Duffy RD in 2019 identified marginalization, work volition, and occupational adaptability as significant predictors of DW (Duffy et al., 2019), providing a theoretical foundation for understanding the factors and mechanisms underlying DW.

Table 7. Reference co-citation network

Ranking	Count	Centrality	Year	Reference
1	75	0.01	2017	Duffy RD, 2017, J COUNS PSYCHOL, V64, P206
2	68	0.04	2016	Duffy RD, 2016, J COUNS PSYCHOL, V63, P127
3	52	0.00	2019	Duffy RD, 2019, J VOCAT BEHAV, V112, P199
4	51	0.00	2019	Blustein DL. 2019, J CAREER ASSESSMENT, V 27, P3
5	48	0.00	2019	Kozan S, 2019, J COUNS PSYCHOL, V66, P317
6	48	0.01	2019	Duffy RD, 2019, J VOCAT BEHAV, V112, P384
7	44	0.01	2018	Duffy RD, 2018, J COUNS PSYCHOL, V65, P280
8	42	0.00	2019	Wang DN, 2019, J VOCAT BEHAV, V115, P0
9	40	0.00	2018	Tokar DM, 2018, J VOCAT BEHAV, V106, P126
10	39	0.01	2019	Di Fabio A, 2019, J VOCAT BEHAV, V 100, P131

Figure 7 visualizes a reference co-citation cluster with 1029 nodes, 2843 links, and 5 clusters. These clusters represent co-cited literature, highlighting key research topics related to DW. The analysis of clusters is as follows.

Clusters 2# (engaging psychology), 3# (psychological perspective), and 11# (psychological capital) examine the psychological aspects of DW. Key co-cited works in Cluster 2# include Rodriguez (2016) and Blustein (2016). Highly cited papers in Cluster 3# are Burchell (2014) and Sehnbruch (2015). Representative research in Cluster 11# features Webster (2015) and Kline (2016). These clusters focus on micro-level studies of DW through a psychological perspective. For example, Blustein (2016) integrated work meaning into DW to address concerns that scholars view the concept of DW as too narrow (Blustein et al., 2016). This research broadened the understanding of DW and set the stage for interdisciplinary exploration. Webster (2015) developed a diagnostic tool for industry employees by combining surveys with in-depth interviews. Compared to the ILO's suggested indicators, this tool can track DW progress and inform human resource management strategies (Webster et al., 2015).



**Figure 7.** Cluster visualization of reference co-citation network

Cluster 0# context conceptualization focuses on DW context and concept development. Key co-cited references are Duffy (2016, 2017). Duffy's latest research examines the mechanism of DW and finds a moderate correlation between happiness and professional ability, with no significant differences across countries, regions, or social status groups (Su and Chan, 2023). This study systematically analyzed factors related to DW, providing a knowledge foundation for future quantitative research by scholars.

Cluster 9# (living wage) emphasizes the income perspective of DW. Key literature in this cluster includes works by Blustein (2023) and Allan (2021). Recent research suggests examining the living wage through the perspective of PWT, moving away from its traditional economic focus. This new perspective shifts attention from macroeconomic and econometric analyses centered on policy costs to a people-oriented approach that prioritizes employees and their families (Ghai, 2003). The change in perspective provides a foundation and empirical support for the formulation of labor market policies across countries and regions.

*Author co-citation network*

Table 8 presents the author co-citation ranking on DW. The years listed in Table 8 denote the earliest year in which the author was co-cited. The data reveal that all authors have over 70 co-citations, with four exceeding 100, highlighting their significant influence in this field. The details are as follows.

The author with the highest co-citation count is the ILO, with 305 citations and a centrality of 0.08. The ILO was the first international organization to propose DW, defining it at the macro level and developing an index to assess it across countries, regions, and groups, thereby providing a theoretical basis for labour market policies (Ghai, 2003). Duffy RD and Blustein DL focus on DW from a psychological perspective, emphasizing individual perception, scale development, and predictive factors (Duffy et al., 2016, 2020; Sanhokwe and Takawira, 2023). The author with the highest centrality is Anker R, who has a centrality of 0.19 and 73 citations. The paper from Anker R, titled “Measuring decent work with statistical indicators,” was the first to establish DW indicators (Anker et al., 2003).

**Table 8.** Author co-citation network

Ranking	Count	Centrality	Year	Cited author
1	305	0.08	2003	ILO
2	196	0.03	2016	Duffy RD
3	193	0.07	2016	Blustein DL
4	118	0.00	2019	United Nations
5	92	0.01	2017	Allan BA
6	86	0.01	2016	Di Fabio A
7	74	0.00	2018	Autin KL
8	73	0.19	2003	Anker R
9	73	0.02	2016	Savickas ML
10	72	0.05	2013	World Bank

Figure 8 illustrates the clustering of co-cited authors, with 998 nodes, 3721 links, and 14 clusters. These clusters represent co-cited authors and their research topics within DW, highlighting prominent researchers in this field. The details are as follows.

Cluster 14# sustainable development, Cluster 8# sustainable development goal, and Cluster 11# International Labour Organization focus on macro-level research of DW. Notably, the co-cited authors, Baum T and Frey DF, in Cluster 11# emphasize DW’s role in achieving the SDGs. Sachs JD argues that eliminating education disparities, gender inequality, and overall inequality is essential to achieving the SDGs (Sachs et al., 2019). Baum T highlights that people and work are central to sustainable development; thus, enhancing workers’ abilities in sustainable employment, service provision, and quality—especially in tourism—is vital for realizing sustainable tourism goals (Baum, 2018).

Cluster 0# decent work, Cluster 2# work rights, Cluster 12# vulnerable employment, Cluster 4# precarious employment, Cluster 1# job quality, and Cluster 9# organizational psychology focus on the mechanism of DW. Key co-cited authors include Duffy RD and Blustein DL for Cluster 0#, Benach J and Sen A for Cluster 2#, Lewis WA and the World Bank for Cluster 12#, the World Health Organization, and Standing G for Cluster 4#, Ghai D and OECD for Cluster 1#, and Carr SC and Braun V for Cluster 9#. These studies

emphasize theoretical studies, concept development, related factors, and moderating and mediating effects. For example, Sen A argues that achieving DW requires an inclusive approach, rights-based thinking, contextualizing work within economic, political, and social frameworks, and expanding research to a global level (Sen, 2013). Carr SC's recent research highlights how sustainable livelihoods can enhance individual career development through DW. He uses the transition from coal mining to carbon neutrality to illustrate improvements in fair treatment for miners that benefit the overall labour market ecosystem (Hopner et al., 2024).

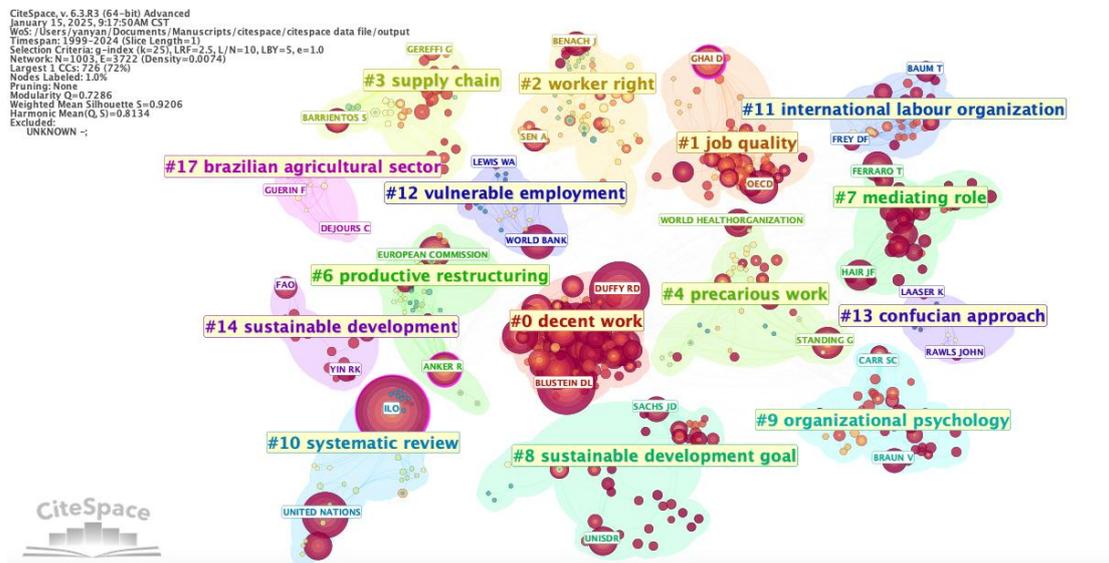


Figure 8. Cluster visualization of author co-citation network

Some clusters focus on DW research methods, including the Confucian approach (Cluster 13#), mediating role (Cluster 7#), and systematic review (Cluster 10#). The co-cited authors in Cluster 13# are Laaser K and Rawls John. Notable authors in Cluster 7# include Ferraro, T, and Hair, J.F. In Cluster 10#, co-cited authors are ILO and UN. Laaser K's representative research reviews the literature on meaningful work across organizational behavior, political philosophy, humanities, and sociology, suggesting that low-skilled work can also be meaningful (Laaser and Bolton, 2022), thus broadening the concept of DW. Ferraro T examined the link between DW and job burnout through empirical studies, finding a significant negative correlation between DW principles—such as adequate working hours—and burnout (Dinis et al., 2024). This insight provides scholars with a basis for exploring the micro-mechanism of DW. Future research could connect DW with emotional labor for further investigation.

Cluster 6# predictive restructuring, Cluster 17# Brazilian agricultural sector, and Cluster 3# supply chain concentrate on the interdisciplinary and regional studies of DW. The highly co-cited authors in Cluster 6# include the European Commission and Anker R; the widely followed authors in Cluster 17# are Guerin F and Dejourns C; and the influential authors in Cluster 3# are Gereffi G and Barrientos S. These researchers examine regional group studies of DW and cross-disciplinary research related to supply chains. Specifically, Dejourns C's recent study investigates workplace harassment through psychopathology and psychodynamics, revealing its significant impact on workers' psychological functions (Duarte and Dejourns, 2019). Gereffi G's latest research links DW

to global value chains, proposing a labour governance framework grounded in longitudinal and comparative studies (Gereffi et al., 2021). These findings inspire scholars to pursue cross-disciplinary research on DW from various perspectives within their fields.

### *Co-occurrence analysis*

The co-occurrence analysis shows the frequency with which categories and keywords appear together. By analyzing keyword co-occurrence with CiteSpace, readers can grasp the connections between keywords and identify research hotspots and trends. This part covers category co-occurrence, keyword co-occurrence, and keyword bursts.

#### *Category co-occurrence*

Table 9 presents the top ten co-occurrence categories, which primarily lie in environmental science, economics, management, and psychology. The years listed in Table 9 indicate the earliest year in which co-occurrence of the categories was observed. The details are as follows.

Environmental science and sustainable development show high counts and centralities. Environmental science has the highest co-occurrence count (215), a centrality of 0.24, and a co-occurrence year of 2012, indicating that DW is a significant topic. Psychology has recently emerged as a frequently co-occurring category. Applied Psychology has a count of 143 and a centrality of 0.04 since 2012. Economics and management are traditional co-occurring fields in DW. The centrality of economics is 0.18, while management is 0.13, indicating its influence in both areas. However, the count of co-occurrences is much higher in economics (148) compared to management (89), suggesting a significantly stronger presence in economics.

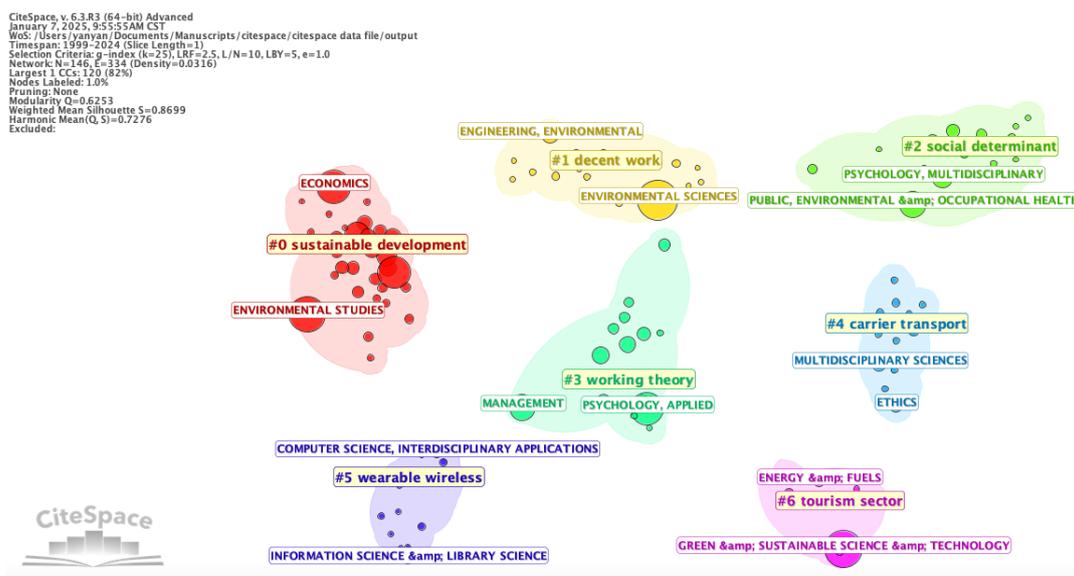
**Table 9.** *Category co-occurrence*

Ranking	Category	Count	Centrality	Year
1	Environmental Science	215	0.24	2012
2	Green & Sustainable Science & Technology	192	0.16	2009
3	Environmental Studies	181	0.25	2008
4	Economics	148	0.18	2000
5	Psychology, Applied	143	0.04	2012
6	Industrial Relations & Labor	137	0.05	2000
7	Management	89	0.13	2009
8	Public, Environmental & Occupation Health	88	0.23	2004
9	Development Studies	79	0.08	2007
10	Psychology, Multidiscipline	45	0.09	2007

Figure 9 presents a visualized clustering of category co-occurrence, with 146 nodes and 334 links.

Cluster 0#, 1#, and 6# focus on the realization of DW in the SDGs. Cluster 0# encompasses economics and environmental studies. Recent research suggests that SDG 8, “Decent Work and Economic Growth,” should align with disciplinary development; therefore, it is proposed to rename this goal “Sustainable Work and Economic Growth.”

Achieving sustainable development requires comprehensive approaches to ensure a viable future for current and future generations (Kreinin and Aigner, 2022). Cluster 1# represents engineering and environmental science. Research indicates that Indonesia has implemented a sustainable, smart waste management system that leverages Industry 4.0 technologies and brings stakeholders together to tackle waste management challenges collaboratively (Fatimah et al., 2020). The categories in Cluster 6# include energy and fuels, green and sustainable science, and technology. Research indicates that circular economy practices support achieving SDG 8. However, there is a conflict between safe working conditions and human health, on the one hand, and the electronic waste and wastewater produced by urban development, on the other. Therefore, the government must coordinate resources to address these issues while promoting DW and economic growth through circular-economy practices (Schroeder et al., 2019). These clusters emphasize improvements to the theoretical framework and related practices for SDG 8, demonstrating scholars' multidisciplinary exploration of DW initiatives.



**Figure 9.** Cluster visualization of category co-occurrence

Some interdisciplinary research on DW focuses on clusters such as Cluster 2# social determinants, Cluster 4# carrier transportation, and Cluster 5# wearable wireless technologies. Cluster 2# includes psychology, public health, and occupational health. Research shows that advanced information and communication technologies define the Fourth Industrial Revolution (FIR). To address occupational health challenges in the FIR, we need to establish new DW standards, create standardized regulations for enterprises globally, integrate public health into occupational health and safety (OHS), and train experts on emerging OHS issues (Min et al., 2019). Cluster 4# primarily involves multidisciplinary science and ethics. Recent research from a sociological perspective suggests that marginalization varies spatially, influenced by employability. Thus, conducting more spatialized empirical studies in the field of DW is essential (Wall et al., 2024). The representative categories under Cluster 5# include computer science, interdisciplinary applications, and information science. Recent research in this cluster highlights the value inequality faced by drivers using shared mobility apps and its effects

on DW. Notably, relationship inequality is the most pressing concern for drivers. These findings can guide policymakers in creating effective digital platform regulations to promote DW for shared mobility app drivers (Hazra et al., 2024). Additionally, the research suggests future directions for scholars focusing on new labour forms arising from the FIR, marginalization, and the sharing economy.

Cluster 3# working theory focuses on DW's theoretical foundations. Representative categories include management and applied psychology. Recent research in this cluster examines emerging adults in South Korea, exploring how the economy, academic status, and marginalization affect perceptions of DW through the perspective of PWT. The findings indicate that economic and academic limitations negatively influence future DW perceptions via work volition; additionally, social support moderates the relationship between marginalization and DW perceptions (Song and Lee, 2023). This moderating effect contradicts aspects of PWT, suggesting that scholars should verify and revise the model in future studies.

#### *Keywords co-occurrence*

The co-occurrence of keywords highlights the core themes in DW research, helping scholars identify key topics and future research trends. *Table 10* presents the top 10 co-occurring keywords related to DW and the earliest year each keyword co-occurred. The details are as follows.

**Table 10.** *Keyword co-occurrence*

Ranking	Keyword	Count	Centrality	Year
1	Decent work	417	0.36	2006
2	Sustainable development goals	95	0.02	2016
3	Employment	87	0.07	2004
4	Psychology	78	0.04	2016
5	Health	71	0.09	2008
6	Performance	69	0.01	2018
7	Impact	61	0.04	2001
8	Labor	59	0.14	2004
9	Management	57	0.01	2018
10	Sustainable development	54	0.01	2016

The top 1 keyword is “decent work,” appearing 417 times, far surpassing the second-ranked keyword “SDGs” (95 times). Its centrality is 0.36, significantly higher than that of the second-ranked keyword “labour” (0.14). Key studies examine the relationship between DW and meaningful work, which is linked through need satisfaction to social environments, organizational conditions, and personal practices. Future research could explore interdisciplinary approaches at macro and micro levels to enhance workers’ living and working conditions (Blustein et al., 2023). The second-ranked keyword is “SDGs,” appearing 95 times with a centrality of 0.02. This suggests significant academic interest, though its influence needs to be enhanced. SDG 8, “Decent Work and Economic Growth,” has been researched in relation to information technology. Recent studies have examined the conflict between SDG 8 and artificial intelligence (AI) (Braganza et al., 2021).

The eighth most frequently co-occurring keyword, “labour” (count 59), has a centrality of 0.14, indicating that while its frequency is low, its influence is significant. Studies suggest that achieving the SDG of productive employment and DW for all by 2030 requires recognizing the value and cost of social reproduction. However, unpaid care and domestic work related to childbirth are not considered. To meet this goal, commitments to inclusiveness and sustainability must be made, and DW must prioritize gender equality and equal labour rights (Rai et al., 2019).

*Figure 10* shows the co-occurrence timeline clusters of keywords, depicting the evolution of theme keywords related to DW over time. The specific analysis is as follows.

Some clusters began early and have persisted into 2024, reflecting ongoing academic interest, such as Cluster 0# SDGs. This cluster emphasizes achieving DW within the context of sustainable development. The keyword “perspective” has co-occurred since 1999, with studies from a psychological viewpoint examining the link between sustainable development and personal resources. From this perspective, career sustainability is influenced not only by individual career management but also by transitions in work environments and quality of life. Consequently, employability and meaningful work significantly affect an individual’s quality of life, while accumulating career resources aid in attaining decent, meaningful work to improve one’s life (Magnano et al., 2019). The keyword “impact” emerged in 2001 within Cluster 0#, indicating a strong research presence. Studies grounded in PWT examine factors influencing DW. Findings reveal that economic constraints and marginalization negatively affect DW and work volition, while occupational adaptability positively predicts DW and partially mediates the relationship between financial constraints and DW (Tokar and Kaut, 2018). The keyword “innovation” had the highest co-occurrence frequency in 2022 and 2024, marking it as a recent research hotspot. Recent studies indicate that during green economic transformation, new types of DW offer promising prospects, given the bidirectional causal relationship between human capital and environmental sustainability. Consequently, governments can develop innovative policies for investing in green human skills (Ganda, 2022).

Some clusters emerged later but have recently seen a notable rise in co-occurring keywords, such as Cluster 2# “work volition.” The earliest and most frequently co-occurring keyword in this cluster is “satisfaction,” which first appeared in 2015 and continued through 2024. Studies indicate that women in the hotel industry experience significant labour market discrimination, resulting in lower job quality compared to men, with this gender gap widening with age. Consequently, women report lower job satisfaction, underscoring the need to improve working conditions for them (Santero-Sanchez et al., 2015). The keyword in this cluster is “psychology,” which emerged in 2016 and remains relevant today. Research has adapted the DWS to the Swiss context, identifying antecedents like perceived social status and job insecurity, as well as outcomes such as job life satisfaction. This adaptation enhances the understanding of PWT. The most recent co-occurring keyword is “volition,” which appeared 4 times in 2024. Recent studies have examined how economic constraints and marginalization affect work volition, career adaptability, and perceptions of future DW among emerging adults in Nigeria. Findings indicate that while career adaptability and work volition can predict views on future DW, economic constraints and marginalization do not contradict earlier research conclusions and suggest a need for scholars to reassess these relationships.

Some clusters have emerged as research hotspots in recent years. For instance, attitudes under the Cluster 4# pandemic, performance under the Cluster 5# trade union,

and social support from the Cluster 6# case study. The keyword “attitudes” refers to a study that analyzes DW in the tourism and hotel industries using a knowledge graph. The findings identify six clusters: labour rights and gender equality; sustainability and health; work theory and psychology; the conceptualization of DW; marginalized groups and unemployment; and work quality. Employee attitudes towards DW can enhance human resource management in enterprises via corporate social responsibility initiatives (Wang and Cheung, 2024). The keyword “performance” first appeared in 2018. Research suggests that companies with quality, environment, and occupational health and safety (QEOHS) certifications should assess their sustainable development performance across three dimensions: economy, environment, and society. An analysis of survey data from 235 QEOHS enterprises in Portugal revealed an average reporting status on SDGs. Notably, SDG 8 accounted for 20% of total achievements, ranking fourth among the 17 goals (Fonseca and Carvalho, 2019). The keyword “social support” first emerged in 2016 and remains relevant today. Recent studies on this co-occurrence examined the trickle-out effects of organizational dehumanization support. Specifically, supervisors who feel dehumanized may exhibit destructive behavior toward subordinates rather than aggression. Consequently, affected subordinates might direct harmful behaviors toward family members, ultimately undermining relationship satisfaction and emotional support within families (Lagios et al., 2023).

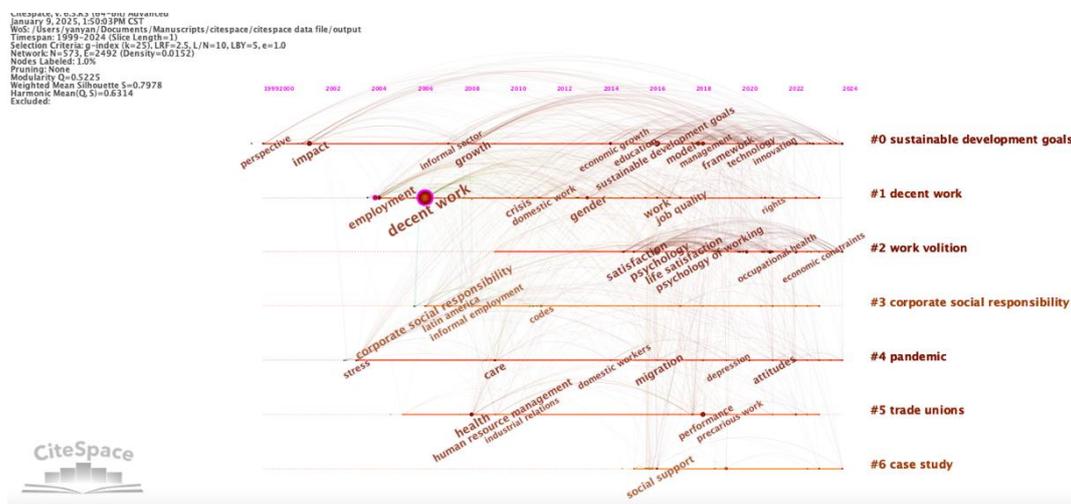


Figure 10. Cluster visualization of keywords co-occurrence

### Keyword bursts

Keyword bursts indicate a sudden increase in citations for keywords related to DW, helping readers understand the evolution of key topics. Figure 11 displays the 23 most cited keywords. The red lines indicate when each keyword became an academic hotspot; light blue shows nodes that have not yet appeared, while dark blue lines represent the duration of each keyword’s presence.

From the perspective of keyword burst intensity and duration, the top three keywords are “psychology of working” (6.01), “work” (4.03), and “life” (4.01). These have been extensively researched from 2016 to 2021. In terms of burst duration, the longest-lasting keywords are “trade unions” (2005-2018), “employment relations” (2011-2018), and “bad jobs” (2013-2019). Notably, “trade unions” had a 13-year burst, starting first; the

other two lasted 7 and 6 years, respectively. Looking ahead to 2024, the keywords expected to continue to surge are “governance” (2.91) and “workplace” (3.48). “Governance” has been active for 4 years since 2020, while “workplace” began in 2022 and has been active for 2 years. These suggest that future research on DW may focus on workplace and governance issues.

### Top 23 Keywords with the Strongest Citation Bursts

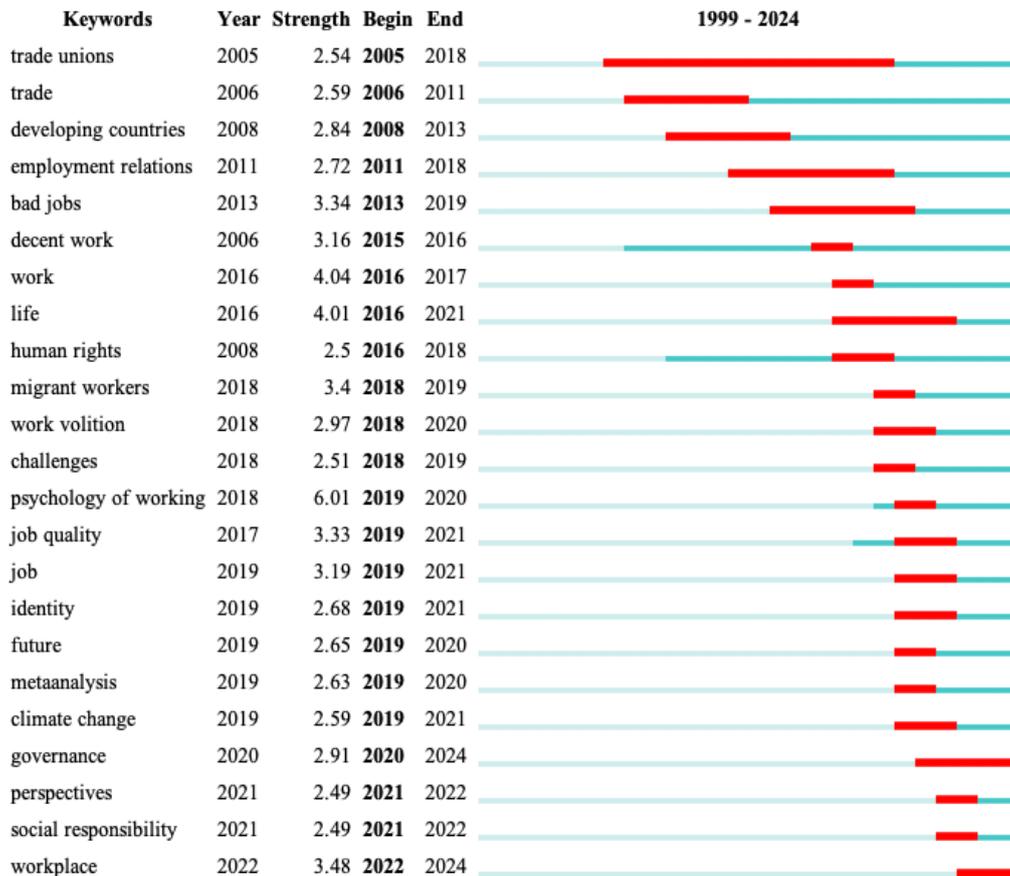


Figure 11. Visualization of keywords burst

## Discussion

Based on a bibliometric analysis of DW over the past 25 years, we examined its development trends and research hotspots and constructed a corresponding knowledge framework. We then predicted future research directions and offered valuable references for scholars. Finally, we discussed the theoretical implications and practical implications of this research.

## Knowledge framework

Although the analysis has thoroughly introduced research topics and achievements related to DW since 1999, readers still struggle to understand the overall picture and future trends. Therefore, constructing a knowledge framework is essential for systematically summarizing prior research. We have developed the BIPF framework (see

Fig. 12), which enables scholars to quickly grasp core knowledge in this field by addressing key research questions on DW.

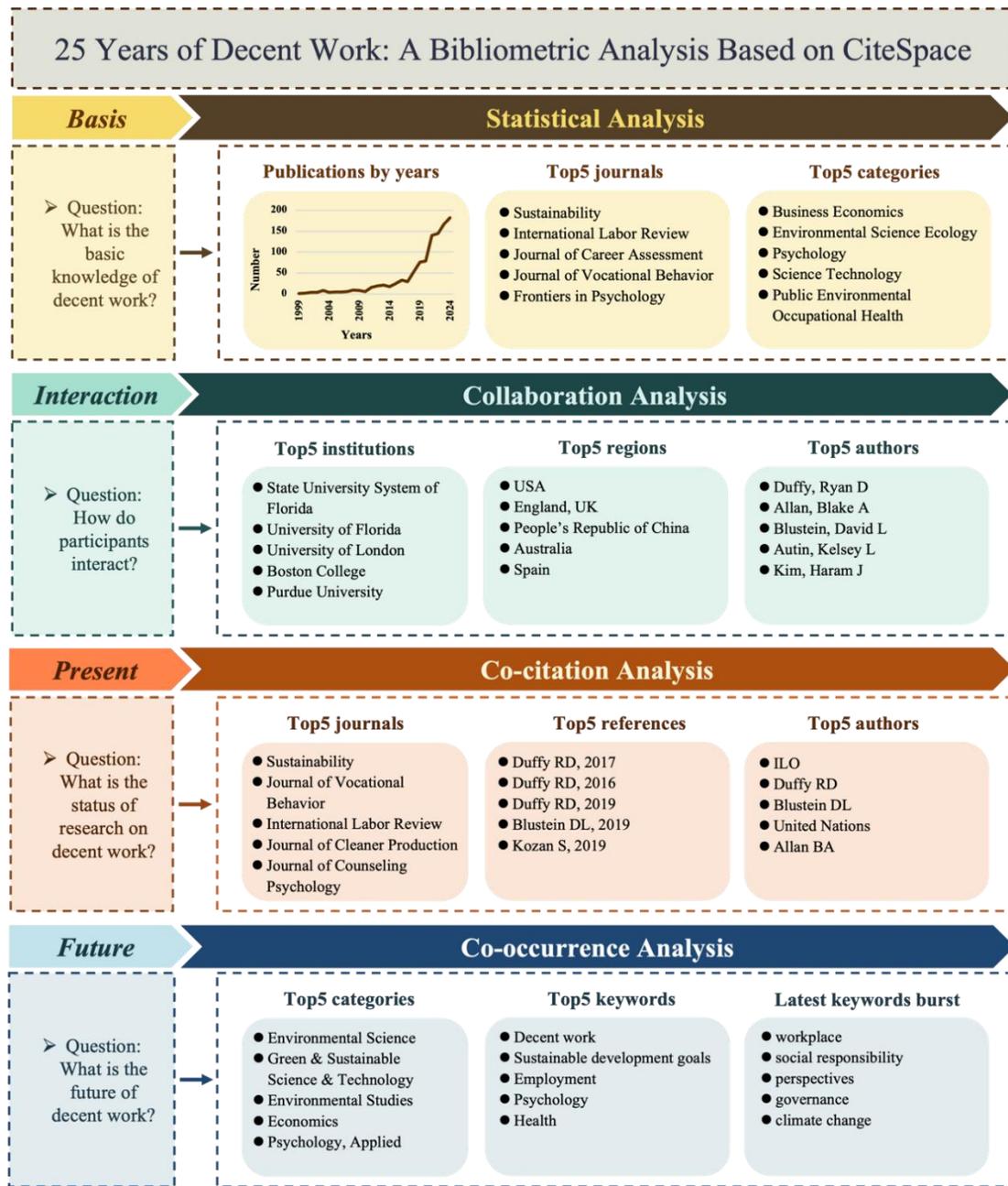


Figure 12. Knowledge framework of decent work

Figure 12 illustrates the DW framework, which consists of four parts resembling a knowledge tree that outline the foundation, relationships, status, and future of DW research. The first part is the basis, detailing fundamental research questions in DW. It addresses “What is the basic knowledge of DW?” to help scholars grasp key themes and spark their interest in this area. The second part is interaction, highlighting relationships among participants in DW. It answers the question “How do participants interact within DW?” by helping scholars identify who these participants are and how they collaborate.

The third part focuses on the present, with authoritative research and significant topics related to DW. It responds to “What is the status of research on DW?” providing insights into current trends. The fourth part is the future, discussing the development process of DW and predicting upcoming trends. It answers the question, “What is the future direction of DW?” enabling scholars to quickly identify emerging research hotspots for interdisciplinary exploration.

In the “Basis” part, we analyzed publications by year, journal, and category. The findings reveal a significant surge in publications since 2021, with Sustainability being the leading journal with a primary focus on Business Economics.

In the “Interaction” part, we examined institutional, regional, and author collaborations. The most active institutions are the State University System of Florida, the University of Florida, and the University of London. Key regions for collaboration include the USA, England, the UK, and China. Prominent authors are Duffy Ryan D., Allan Blake A., and Blustein David L., who have had a substantial influence on DW research.

In the “Present” section, we analyzed co-citation among journals, references, and authors. The results indicate that Sustainability, Journal of Vocational Behavior, and International Labour Review are the most cited journals. The top three co-cited works are Duffy, R. D. (2017), J COUNS PSYCHOL, V64, P206; Duffy, R. D. (2016), J COUNS PSYCHOL, V63, P127; and Duffy, R. D. (2019), J VOCAT BEHAV, V112, P199. The leading co-cited authors are ILO, Duffy, R. D., and Blustein, D. L.

In the “Future” section, we examined development trends and research hotspots in DW using category co-occurrence analysis, keyword co-occurrence, and burst analysis. Environmental Science, Green & Sustainable Science & Technology, and Environmental Studies rank as the top three categories. Co-occurred keywords include DW, SDGs, and employment. Among keywords with bursts of interest, “psychology of working” has the highest burst intensity, while “trade unions” has the most extended duration. Keywords expected to continue their burst into 2024 include governance and workplace.

### ***Future research directions***

(1) Future research on DW will increasingly emphasize interdisciplinary approaches. Specifically, it will integrate business (economics and management) with the humanities (psychology, sociology, law, public administration), the natural sciences (environmental science and technology), and applied disciplines (engineering and ecology). This approach aims to explore how DW contributes to social and economic development, the Sustainable Development Goals, government efficiency in governance, and labour-market policies that enhance enterprise performance. Cross-disciplinary research between the humanities and natural sciences will examine the effects of tools such as the gig economy, artificial intelligence, and big data on individuals’ perceptions of DW and on employee mental health. Additionally, the intersection of business with applied disciplines will investigate how DW influences regional ecological development, focusing on sustainability in regional growth, industry practices, and stakeholder engagement within ecosystems.

(2) Future research will increasingly focus on DW from the workplace perspective. Previous studies have primarily examined work quality, harassment, and labour rights—topics that will remain research hotspots. The rise of digital technology has transformed working methods and impacted workers’ rights and quality of life. Future studies can explore how DW influences the work-family relationship, including its role in alleviating conflicts, enhancing work-life quality, and improving workers’ overall well-being.

(3) Future research will focus on the impact of DW applications on government governance. Previous studies have primarily addressed the formulation of labour market policy and the enforcement of laws protecting labour rights. These topics can be further explored. For example, future research could examine the current state of DW for gig economy workers, strategies to protect vulnerable employment workers' rights and dignity, and ways to enhance human resource quality.

(4) Future research can explore additional models. Previous models were primarily theoretical, validated through structural equation models or multiple linear regression. Future studies could adopt interdisciplinary approaches to investigate the effects of DW. For example, the fsQCA method may identify influencing factors, a three-layer BP neural network model can assess its effectiveness, and system dynamics modeling can evaluate its impact on enterprise performance.

### ***Theoretical and practical implications***

The theoretical implications of this study are twofold. First, we provide a comprehensive perspective on DW by tracing its evolution from the ILO's proposal to its inclusion in the SDGs. We have constructed a systematic knowledge framework based on data analysis, offering a clearer understanding of the theoretical foundation of DW compared to previous studies. Second, this study provides theoretical guidance for research on DW. Through bibliometric analysis, we identified key themes and disciplines in this field, including psychology, SDG 8, and employment quality. Additionally, we highlighted future research hotspots, including interdisciplinary studies, the impact of artificial intelligence on workers, and workplace perspectives, providing direction for upcoming research on DW.

The practical implications of this research include the following: first, it helps policymaking. By analyzing DW across countries and regions and identifying key indicators and influencing factors, this research helps governments set more scientifically and reasonably formulated goals for DW. It promotes equality and efficiency in the labour market while providing a theoretical basis and empirical support for labour-market policymaking; second, it enhances management practices. We focus on applying DW principles in human resource management, particularly by exploring the link between DW, employee creativity, and organizational performance, and by guiding enterprises to develop humane management practices and high-performance work systems.

## **Conclusions**

### ***Critical findings***

This study used CiteSpace to analyze the status, evolution, and future research trends of DW through a bibliometric analysis of 1218 articles in WOS. The main findings include:

(1) There has been explosive growth in publications on DW since 2021, attracting attention from scholars across various fields such as economics, management, psychology, sociology, environmental science, technology, law, and public administration. Sustainability published the most papers related to this topic.

(2) In collaboration analysis, the State University System of Florida had the highest collaboration frequency. The United States was the leading region for collaborations. Ryan Duffy from the University of Florida emerged as the author with the highest collaboration frequency and has focused on DW through the PWT.

(3) Co-citation analysis revealed that Sustainability had both the highest co-citation frequency and number of publications. The ILO was the most frequently co-cited institution. However, Duffy RD's 2017 paper (Journal of Counseling Psychology V64 P206) was notably highly co-cited. This indicates that innovative research is being conducted in line with macro goals, while micro-level studies are also attracting significant scholarly interest.

(4) In co-occurrence analysis, environmental science showed the highest frequency in the category of co-occurrence. Recent research hotspots have centered around keywords such as attitude, performance, social support, governance, and workplace.

(5) Future research will increasingly emphasize interdisciplinary approaches and multi-disciplinary models to expand understanding of DW further.

### ***Limitations to future research***

(1) Our data spans from January 1st, 1999, to December 31st, 2024, comprising 1218 valid documents. It does not encompass all recent literature. Therefore, we need to include more literature in future research.

(2) We focused solely on English papers, excluding those in other languages. This limitation may overlook valuable contributions from scholars, journals, regions, and institutions publishing relevant work in different languages. Therefore, we must broadly collect multilingual literature using practical translation tools.

(3) We selected only the SSCI, SCIE, and AHCI databases in WOS and did not include articles from other databases. In the future, we will also need to consider literature and materials from different databases.

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