

## Trends and Research Directions of Human Capital in the Public Sector: A Bibliometric Analysis

Author:

Annisa Renanthera Azzara<sup>1</sup>, Robert Simbolon<sup>2</sup>, Sri Hartati<sup>3</sup>, Muhammad Takiyuddin Ismail<sup>4</sup>

Affiliation:

Institut Pemerintahan Dalam Negeri, Jl. Raya Bandung-Sumedang KM. 20, Jatinangor,  
Sumedang, West Java 45363, Indonesia <sup>1,2,3</sup>

Faculty of Social Science and Humanities, Universiti Kebangsaan Malaysia, Bangi, Selangor,  
Malaysia<sup>4</sup>

e-Mail:

annisarenanthera11@gmail.com<sup>1</sup>, rsimbolon@hotmail.com<sup>2</sup>, srihartatiipdn@gmail.com<sup>3</sup>,  
taki@ukm.edu.my<sup>4</sup>

\*Corresponding author

Robert Simbolon

Institut Pemerintahan Dalam Negeri (IPDN)

Email: rsimbolon@hotmail.com

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### ABSTRACT

*Human resources are critical factor that drives the competitiveness of public sector organizations to achieve better performance. This study aims to map the evolution of research on human capital in the context of human resources in the public sector by using bibliometric analysis. Data were retrieved from Scopus database covering the period 1966 to 2025 with a research sample of 2.034 journal publications according to the selected keywords. The search strategy combined two sets of keywords: "human capital" OR "human capital development" OR "workforce management" and "public sector" OR "public administration" OR "government" OR "civil service" OR "public organization", applied to titles, abstracts, and keywords (TITLE-ABS-KEY). The final dataset, consisting of journal articles in English and indexed in relevant subject areas such as social sciences was analyzed using VOSviewer software. The analysis identified research trends, author productivity, institutional and country contributions, keyword co-occurrence clusters, and future research directions. This study contributes by providing a systematic mapping of human capital research in the public sector, highlighting both the progress achieved and the gaps that remain for further exploration. The authors conclude that it is important to increase public organizations awareness of the role of human resources and human capital investment with the development and management of human resources, and that there is a need for the development of research themes to broaden insights and update the literature in the future.*

**Keywords:** *Human Capital; Human Capital Development; Public Sector; Civil Service; Bibliometric Analysis*

### ABSTRAK

*Sumber daya manusia merupakan faktor kritis yang mendorong daya saing organisasi sektor publik untuk mencapai kinerja yang lebih baik. Studi ini bertujuan untuk memetakan evolusi penelitian tentang modal manusia dalam konteks sumber daya manusia di sektor publik menggunakan analisis bibliometrik. Data diperoleh dari basis data Scopus yang mencakup periode 1966 hingga 2025 dengan sampel penelitian sebanyak 2.034 publikasi jurnal berdasarkan kata kunci yang dipilih. Strategi pencarian menggabungkan dua set kata kunci: “modal manusia” ATAU “pengembangan modal manusia” ATAU “manajemen tenaga kerja” dan “sektor publik” ATAU “administrasi publik” ATAU “pemerintah” ATAU “pelayanan sipil” ATAU “organisasi publik” yang diterapkan pada judul, abstrak, dan kata kunci (TITLE-ABS-KEY). Data akhir, yang terdiri dari artikel jurnal dalam bahasa Inggris dan terindeks di bidang-bidang relevan seperti ilmu sosial, dianalisis menggunakan perangkat lunak VOSviewer. Analisis ini mengidentifikasi tren penelitian, produktivitas penulis, kontribusi institusi dan negara, kluster kemunculan kata kunci, serta arah penelitian masa depan. Studi ini berkontribusi dengan menyediakan pemetaan sistematis penelitian modal manusia di sektor publik, menyoroti baik kemajuan yang telah dicapai maupun celah yang masih perlu dieksplorasi lebih lanjut. Para penulis menyimpulkan bahwa penting untuk meningkatkan kesadaran organisasi publik tentang peran sumber daya manusia dan investasi modal manusia dalam pengembangan dan pengelolaan sumber daya manusia, serta adanya kebutuhan untuk mengembangkan tema penelitian guna memperluas wawasan dan memperbarui literatur di masa depan.*

**Kata kunci:** *Human Capital; Pengembangan Human Capital; Sektor Publik; Pegawai Negeri; Analisis Bibliometrik*

### INTRODUCTION

Technological and digital advancements have significantly transformed the world of work, including the form of organizations manage their human resources. In the public sector, these changes have intensified demands for more effective human resource management to ensure that employees can perform optimally and contribute to organizational goals. The quality of human resources has been shown to influence strategic decision-making and organizational effectiveness (Sukri et al., 2021)

Human resource management plays a decisive role in shaping the future capacity of public organizations. Contemporary public sector HRM practices emphasize training, mentoring, transparency in performance evaluation, and the development of trust within organizations (Mouratidou et al., 2024). Alongside these practices, public organizations are increasingly required to build competitiveness through innovation and creativity derived from their workforce. Beyond technical skills, human resources also encompass soft skills such as integrity, humility sincerity and listening ability, which

are essential for effective public service delivery (Andriansyah et al., 2024). Consequently, human resources are no longer viewed merely as operational inputs but as strategic factors that require continuous development to create sustainable competitive advantages (Arafat et al., 2021).

Within this context, Competent human resources are a key determinant of organizational success in both public and private sectors. Human capital theory conceptualizes employees knowledge, skills and competencies as strategic assets that contribute to organizational performance and competitiveness (Susanto et al., 2019; Fadli and Alie, 2023). Recent studies also indicate that human capital research has evolved alongside the growing demand for data-driven human resource management, particularly (Bonilla-Chaves and Palos-Sánchez, 2023; Kangalakova and Satpayeva, n.d.). Despite this growth, studies specifically examining human capital in the public sector remain more fragmented compared to the extensive literature on private organizations.

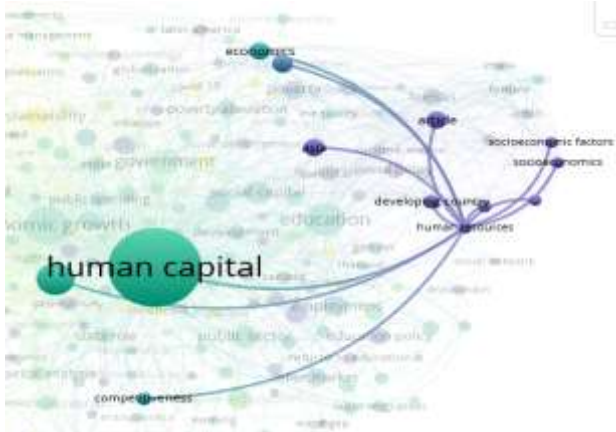
Measurement and management of human capital are therefore critical issues for public organizations. Human capital measurement enables organizations to evaluate employee contributions, assess productivity and design more effective development strategies. This measurement typically encompasses skill management, collective knowledge development, innovation and the capital can be understood as the aggregation of individual knowledge, skills, and abilities that support the achievement of strategic goals, including innovation and service improvement (Sheehan et al., 2025). Improved human

capital has also been associated with higher productivity and better organizational outcomes (Shammot, 2021).

Sustainability has become an increasingly important dimension of human capital development in the public sector. Governments are expected not only to enhance workforce productivity but also to align human capital policies with principles of social sustainability, equity and ethical governance. Issues such as merit-based recruitment, capacity building, civil service reform and ethical behavior of public servants are closely linked to human capital development. Strengthening human capital is widely recognized as a key factor in improving governance quality, accountability and public trust.

Although the importance of human capital in the public sector is widely acknowledged, existing research remains dispersed across disciplines and themes. Previous studies, including systematic reviews of human capital development and organizational performance, demonstrate a growing volume of publication, with notable increases in recent years (Amrullah et al., 2023). However, a comprehensive mapping of research trends, influential contributors and thematic developments specific to the public sector is still limited.

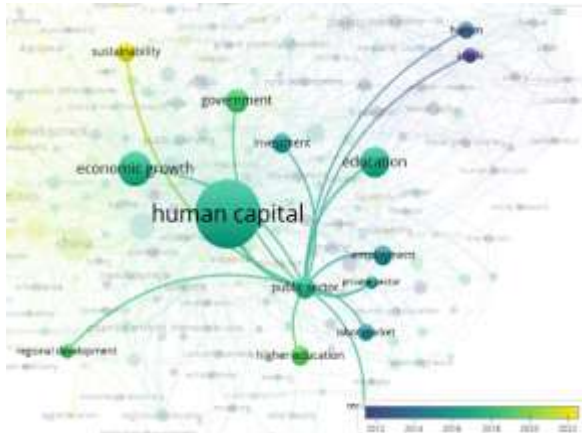
**Figure 1.** VOSviewer visualization of the research data network related to human capital



Sources: Research data 2025

Illustrates the network relationship between one item/keyword and another, which is given a circle-shaped symbol with several colors. The results of data processing show that human resources have an association with the keyword human capital. However, the analysis of human resources in human capital is still very limited, this is seen from the visual of the circle which reflects the small frequency of keyword occurrence.

**Figure 2.** VOSviewer Visualization of The Research Data Network Related to Public Sector



Sources: Research data 2025

In addition, human capital is related to the public sector, which also intersects with the keywords “human” and “article.” This means that human capital in the public sector is always related to humans. However, the frequency of the keyword “human” is still relatively low, meaning that this topic is also rarely discussed. Previous bibliometric studies on human capital have tended to focus broadly on business management, education, or workforce development, without specifically addressing the public sector context. This creates a knowledge gap, while we know much about how human capital drives organizational success in private firms, less is known about how human capital is conceptualized, developed, and studied within public sector organizations.

To address this gap, this study applies bibliometric analysis to map the evolution of human capital research specifically in the public sector. By analyzing publications indexed in Scopus from 1966 to 2025, this research identifies trends, influential authors, institutions, and thematic clusters that shape the discourse on human capital in public administration and government organizations. This mapping not only provides an overview of the current state of knowledge but also highlights research gaps and future directions that can strengthen the role of human capital in the public sector.

This research aims to build a bibliometric analysis as a broad review of human capital literature to answer the following questions:

RQ1 : What are the trends in human capital research based on publication levels?

RQ2 : What is the productivity of authors in publishing human capital research?

RQ3 : Which countries are the most productive in publishing human capital research?

RQ4 : Who are the most productive affiliates in publishing human capital research?

RQ5 : What disciplines contribute the most to human capital research?

RQ6 : What are the author keyword occurrence patterns and emerging trends in human capital research clusters?

RQ7 : What is the potential for future research in human capital research?

Human capital fundamentally reflects the idea that individuals should not be viewed merely as labor resources, but as valuable assets that generate long-term value for organizations. In this perspective, human capital encompasses the knowledge, skills and competencies possessed by individuals that can be mobilized to enhance organizational performance and development (Rohman, 2023). In public organizations, effective utilization of human capital plays a crucial role in improving service quality, institutional capacity and human development outcomes.

Human capital can be understood as a form of capital produced by human resources through both qualitative and quantitative attributes. These attributes enable individuals to combine knowledge, skills and experience to enhance productivity and achieve strategic organizational goals (Sarwiningsih and Widodo, 2022). As a core component of intellectual capital, human capital, human capital is often regarded as the primary production factor within organizations, particularly those that rely heavily on human interactions and decision-making such as public sector institutions

(Kasmawati, 2017).

The relationship between human capital and organizational performance has been extensively examined in both theoretical and empirical studies. Human capital development is closely linked to economic growth and organizational effectiveness, as investments in education, training and skill acquisition contribute to increased productivity and value creation (Sultana et al., 2022). Empirical evidence demonstrates a direct relationship between key human capital components-such as education, experience and skills and income levels, performance outcomes and institutional benefits (Egana-delSol et al., 2019; Adriani, 2019).

Context-specific human resource practices, including training investments and capability development, enable organizations to respond to dynamic environmental changes and innovation demands (Bindeeba et al., 2025). In public sector, these practices are particularly important as organizations face increasing pressure to deliver efficient, transparent and accountable services.

The role of human resources is so great for an organization that human capital needs to be given attention and development continuously to face dynamic changes. Here are some components of human capital according to several experts:

**Table 1.** Components of Human Capital According to Experts

No	Experts	Human capital components
1	Gary S. Becker	Human capital refers to the understanding of individuals through their knowledge, skills, and experience.
2	Mayo (2000)	The human capital is individual ability, individual motivation,



		organizational climate, work group effectiveness and leadership.
3	Gaol (2014)	Further defines human capital as the accumulation of knowledge, expertise and skills that transform employees into organizational assets
4	Isnari Budiarti (2018)	Human capital includes not only knowledge and skills but also attitudes, behaviors and personal experience that shape employee performance (Budiarti, 2017)
5	Razak (2018)	Emphasize innovation and value creation as key outcomes of effective human capital utilization (Razak et al., 2018).
6	Adam Smith, Von Threnen, dan Alfred Marshall (2020)	Human capital consists of skills acquired through education and is useful for all members of society (sukri et al., 2020).

Sources: Research data 2025

A number of previous studies have confirmed that the human capital perspective is not only relevant in the private sector, but is also increasingly positioned as a key factor in public services. For example Purwanitasari et al. (2025) highlight the importance of the person-job fit approach in HR management studies through Scopus-based bibliometric analysis. On the other hand, Quintero-Quintero et al. (2021) emphasize that intellectual capital is the theoretical foundation underlying the global development of human capital. In real life, humans play a major role in increasing productivity and sophisticated production tools and are required to be skilled human resources (HR). Therefore, human resources in human capital can be a success factor for an organization especially the public sector,

so that it needs to be considered and developed continuously (Rasyidi et al., 2020).

## METHODS

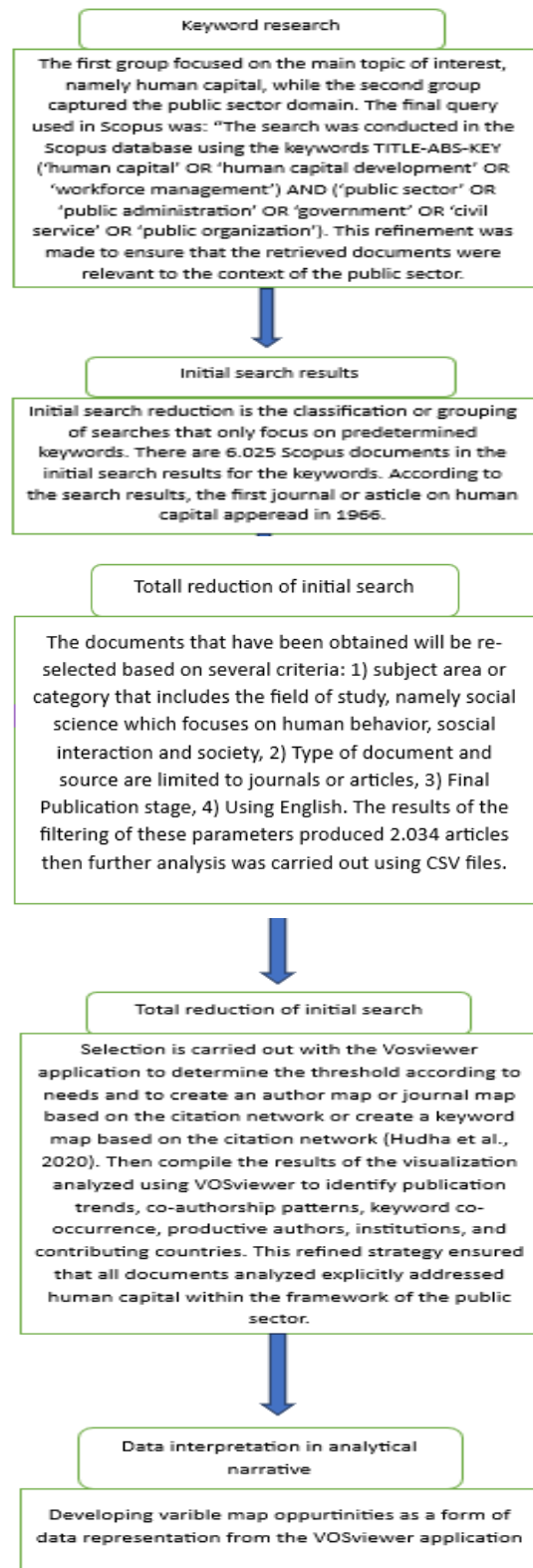
This research design uses bibliometric visualization, as the opinion of the bibliometric analysis research method can answer questions through the development of research and literature (Blažun Vošner et al., 2019). The bibliometric method comprising several stages such as determining keywords, searching, selecting articles, validating, and analyzing data was used to carry out this research (Pambayun, 2021). The sample of this study amounted to 2.034 publications, especially journal articles obtained from the Scopus database according to the selected keywords "human capital" OR "human capital development" OR "workforce management" and "public sector" OR "public administration" OR "government" OR "civil service" OR "public organization" that are limited to the subject area of social science, documents in the form of articles and sourced from journals that have been published in final and using English from 1966 to 2025. The study evaluated the terms human capital and performance from 1966 using the Scopus database. It was found that the development of publications related to human capital was highest in 2024 with a total of 216 publication articles.

The time span of 1966-2025 was intentionally selected to capture the complete historical evolution of human capital research in the public sector. The year 1966 represent the earliest publication retrieved from the Scopus database based on the selected keywords and coincides with early phase of human capital theory development, which began to influence

policy-oriented and public sector studies the 1960s. Bibliographic analysis is design to examine long-term knowledge development rather than short-term research trends. Limiting the analysis to a shorter period, such as 10-25 years, would risk excluding foundational studies that shaped the conceptual and theoretical underpinnings of human capital research. The extended time span enables the identification of key phases in the literature, including the emergence of the concept, periods of growth associated with public sector reforms and New Public Management in the 1980s and more recent thematic expansions related to digital governance, sustainability and crisis-driven transformations (Sharma et al., 2025).

The sample of this study amounted to 2.034 publications, especially journal articles obtained from the Scopus database according to the selected keywords. In this case, to see the trend of international publications, VOSviewer software is used. VOSviewer and visualize networks from bibliometrics. Network visualization in the form of journal publications, researchers, or individual publications and can be built through citations, bibliographic merging, co-citations and relationships between authors. revealed that VOSviewer functions as a builder and visualizes important terms through a collection of scientific literature. The research stages in bibliometric analysis are as follows:

**Figure 3.** Bibliometric analysis phase.

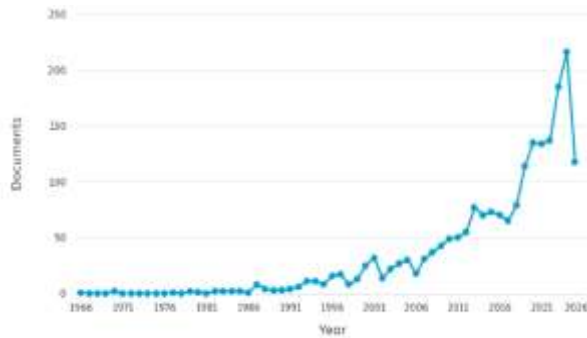


Sources: Author's elaboration 2025

## RESULT AND DISCUSSION

### A. Human Capital Research Trends

**Figure 4.** Human Resource Research Trends in Human Capital Based on Scopus Database



Sources: Research data 2025

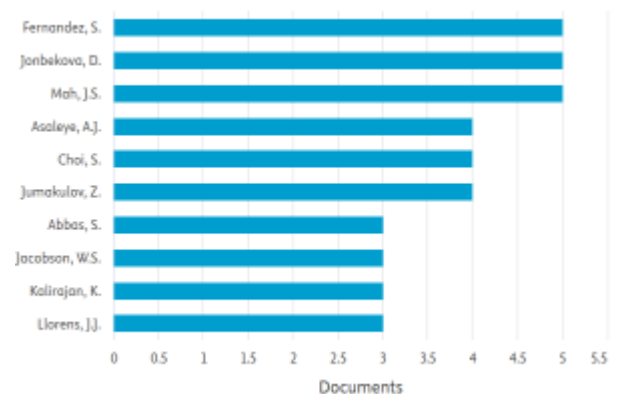
Based on this data, it can be seen that the development of research related to human capital began in 1966 and continued until 2025. Overall, the development of research is dynamic so that some time research has increased but there can also be a decrease. The first increase in research occurred in 2013, increasing to 77 articles, then in 2024 there was a significant increase in the number of research based on articles with related topics, namely to 216 articles. Conversely, there was a decrease in research in 2025, to 118 articles.

In 2011, Open Government was established with eight countries as its initial participants. 2012 was a year of laying foundations, accelerating implementation, and creating new breakthroughs. As a result, in 2013 and subsequent years, many countries began to promote open government and transparency reforms. Not only that, the OECD and World Bank Group began to discuss human capital and the importance of human capital development as the key to bureaucratic reform. In Indonesia, the government began implementing the Grand Design of Bureaucratic Reform in

2013. That is why 2013 was a period of surge in research in the public sector and human resource management due to increased access to public data and performance evaluation of human resources in the public sector. In terms of literature, topics such as civil service reform, performance management, and leadership development began to appear more frequently. These policy shifts contributed to a growing academic interest in mapping and analyzing human capital in the context of the public sector, resulting in a significant rise in related publications. Document by source from the Scopus database can be a reference in determining research trends with related topics. The peak in research on human capital in 2024 shows that this topic remains an interesting topic for discussion because understanding the urgency and impact of developing human resources in the public sector or civil servants through human capital is very important. Meanwhile, despite a decline in 2025, research development related to this topic continues.

### B. Author Productivity in Publishing Human Capital Research

**Figure 5.** Author Productivity



Sources: Research data 2025

The data above illustrates the productivity of the most productive authors

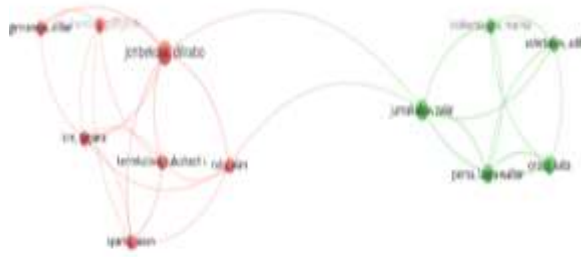


or authors in producing research articles on the topic of human resources in human capital. The graph is formed based on the number of publications without considering the influence on the author. There are ten top authors who contribute to journal articles on the topic.

Fernandez, S., Jonbekova, D., and Mah, J.S. are the leading contributors, each with five published documents. They are followed by Asaleye, A.J., Choi, S., and Jumakulov, Z., who each contributed four documents. Other authors, including Abbas, S., Jacobson, W.S., Kalirajan, K., and Llorens, J.J., also demonstrate notable productivity with three publications each.

This distribution indicates the research productivity in the field is shared among several scholars rather than dominated by a single author. This analysis focuses on publication output as a measure of productivity because publication volume does not necessarily reflect citation impact, as authors with fewer publications may still achieve substantial scholarly influence through highly cited works.

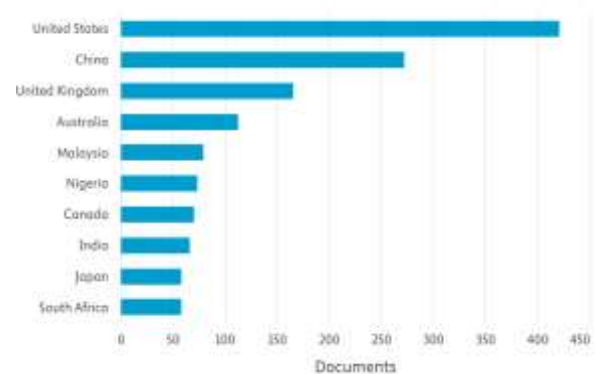
**Figure 6.** Researcher Productivity Visualization Network



Sources: Research data 2025

### C. Most Productive Countries in Publishing Human Capital Researchers

**Figure 7.** Number of Articles by Country of Origin

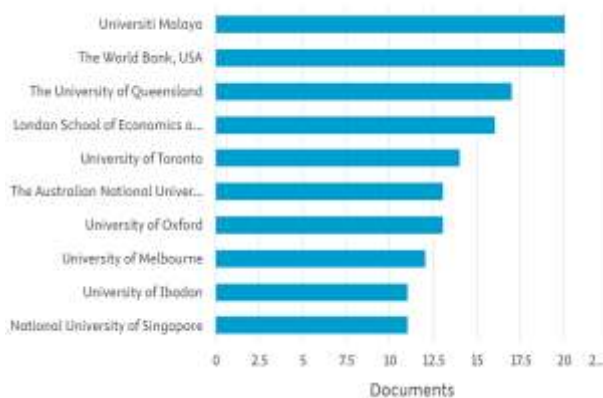


Sources: Research data 2025

The topic of human capital and human resources has become a widely discussed topic around the world but the figure illustrates that research topics remain limited to a few countries. There are ten countries that are the most productive in producing articles on the topic of human capital and human resources. Of course, countries have different numbers of papers. Based on the figure, from 1966 to 2025, the United States is the most productive country with a total of 421 articles related to the topic. This is followed by China with a total of 272 articles and United Kingdom with a total of 165 articles.

### D. Agencies Most Productive in Publishing Human Capital Researchers

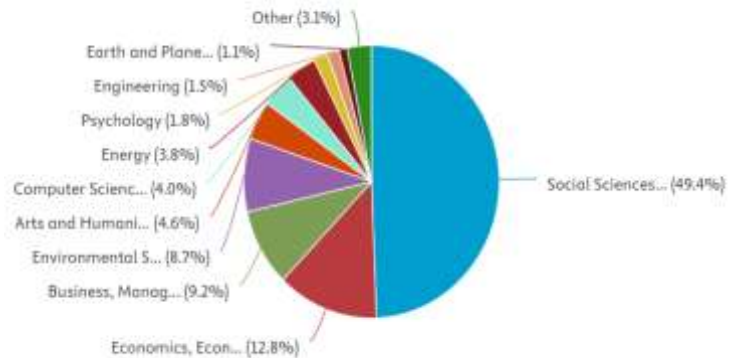
There is a ranking of the top ten agencies/affiliations that contribute to human capital journal articles which can be seen in Figure 8.

**Figure 8. Article Count by Affiliation**

Sources: Research data 2025

The Universiti Malaya is the affiliate with the most research published in journal articles with a total of 20 articles. As one of the leading universities in Southeast Asia, the University of Malaya continues to lead in various academic fields, with a particular emphasis on research and innovation. Its academic achievements have gained global recognition, with consistent rankings among the world's best universities. With the same total number of articles, The World Bank USA is affiliated with the second highest ranking. Next is The University of Queensland which contributed 17 journal articles followed by London School of Economics and Political Sciences which contributed 16 articles and University of Toronto which ranked fifth with 14 articles.

## E. Disciplines that Contribute Most to Human Capital Research

**Figure 9. Subject-Area Analysis**

Sources: Research data 2025

In general, the fields of knowledge in human capital publications are dominant in the fields of social sciences, economics, economics and finance, environment, business and management, and environmental science. It can be seen that the 5 main fields of science are related to humans and economics. Social science is the main field of science in human capital publications, which is 49.4% or 2.034 articles that study culture, creativity and human expression through various forms such as literature, art, visual, music, philosophy and history. After that, there is the field of economics, econometrics and finance by 12.8% or publishing 528 articles, the field business management and accounting by 9.2% or publishing 379 articles, the field of environmental science 8.7% publishing 358 articles and the field of arts and human sciences by 4.6% and publishing 191 articles.



(Zulfia and Frinaldi, 2022).

The second cluster has 51 keywords with green network symbols. In this cluster, the keyword economic growth has the most occurrences, with a total frequency of 175 times. It is evident that there is a relationship between human capital and macroeconomic growth. Human resource empowerment is defined as the process of increasing individual capacity through skills development, access to knowledge, and expanded opportunities for economic participation. From an economic perspective, the empowerment of quality human resources in the public sector is an investment in human capital that provides high returns for a country's economic growth (Zulkarnaen, 2024).

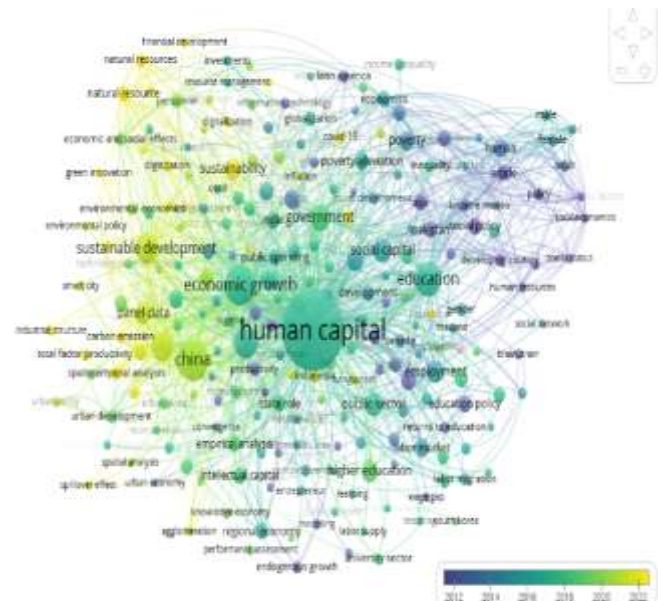
Furthermore, the third cluster consists of 43 keywords with a dark blue network color. The third cluster with a frequency of 136 focuses on education and higher education, directly connected to the public sector and civil service, reflects the increasing research interest in performance management and bureaucratic reform (Ika Widiastuti, 2023). In addition, there is a fourth cluster with a yellow network color with 34 keywords. China items appear most frequently in the fourth cluster, with a frequency level of 198 times. There is a fifth cluster with a purple network color. The fifth cluster has the keyword sustainable development with the highest frequency of 104 times. However, this topic is also accompanied by keywords social capital, indicating the latest trend that links human capital with sustainable governance and Sustainable Development Goals (SDGs).

This change shows a shift from the traditional economic perspective on human capital towards a broader research agenda

that is governance-oriented and focuses on sustainability in the public sector.

### G. Potential future research in human capital research

**Figure 11.** Visualization of human capital related overlays and VOSviewer



Sources: Research data 2025

The overlay visualization above helps the author to understand the trend of keywords/topics in a particular year. The overlay visualization shows that the keyword with a large dot symbol, human capital, was frequently used in research from 1966 to 2025. Another big dot, economic growth, appeared frequently in 2017. In this study, the authors were not only able to identify keywords with a high frequency of occurrence in each cluster, but were also able to identify infrequently occurring keywords with a fairly strong total strength relationship. This literature review focuses on the relationship between human capital and human resources. When viewed from the visualization, human resources are depicted with a small dot, which means that this



keyword is still rarely researched, even though the sustainability of public and private organizations is largely determined by the role of human resources (Gadzali et al., 2023). The implementation of interests, missions and visions in a public organization is managed and run by humans. Thus making humans the main factor in driving the organization. As a superior production factor, HR also needs to have the ability to innovate, unique quality, special expertise, increase productivity and provide different services (Bierema et al., 2023). Measuring the performance of public or private organizations based on a financial perspective can be very accurate and in assessing finances, human capital is needed with its various knowledge, ideas, and innovations. Increasing human capital can be done through an improvement strategy through the view that humans are the only source (resource) that has a competitive advantage, this is very useful for the competitive advantage of the organization (Xanthopoulou et al., 2023). The strategy of increasing human capital can be considered as a strategy in managing human resources. So what public organizations should do is measure the amount of human resources they have, how to measure and manage them, what is the human capital strategy and increase human capital from year to year. Human resource management needs to be done as part of human capital, starting from planning, developing, and optimizing employee potential. This involves a number of activities such as recruiting, training, managing performance and motivating HR so that they can contribute effectively in achieving organizational goals (Mulang, 2021). The rapid development has made empirical studies related to human capital in

the HR aspect also develop rapidly, both theoretically and empirically. The theory shows that it is very important to manage HR and human capital to support success through increasing the value of an organization. This makes the topic of HR in human capital a potential topic to contribute to the organization's understanding of the importance of humans as drivers to achieve organizational goals. This potential topic can be further developed to add to the novelty and development of human capital research. Thus, further research can develop sustainable science. Hopefully, the results of this study can provide input for organizations, especially the public sector, in order to prepare more qualified human resources and view the organization as a unit that contains unique knowledge and skills.

## CONCLUSION

This study conducted a bibliometric mapping of research on human capital in the public sector using data obtained from Scopus between 1966 and 2025. The analysis shows that publications on this topic have increased significantly since 2013, reflecting growing academic and policy attention to public sector reform and the role of human capital in governance. This discovery points out five thematic clusters: capacity building and training, economic productivity, education and skills development, public sector performance management, and sustainability. These clusters capture the manner in which research on human capital has progressed from an economically-focused perspective towards issues of governance and sustainability within the public sector.

By identifying leading authors, institutions, and countries, this study contributes to a clearer understanding



of the intellectual structure and boundaries of research in this field. Importantly, the research results also highlight gaps in the literature, including limited attention to digital transformation, ethical governance, and cross-cultural perspectives in public administration. Therefore, the contribution of this study lies not only in mapping existing trends, but also in providing insights into the future direction of research on human capital in the public sector.

This study has several limitations. Firstly, the analysis relies on the Scopus database alone, which may not cover all the published papers listed in other databases such as Web of Science, Dimensions, or Google Scholar. Secondly, the keyword strategy, though carefully designed, may exclude studies using alternative keywords to describe human capital in the public sector. Thirdly, the bibliometric strategy emphasizes quantitative mapping and patterns of co-occurrences, which may overlook theoretical depth and context. Subsequent studies must address these limitations in the following manners. First, expanding database coverage and refining search terms would provide a richer dataset. Second, combining bibliometric analysis with systematic review of the literature or qualitative content analysis would provide more nuanced theoretical explanation for emergent clusters. Third, researchers should investigate underemphasized issues such as e-government and human capital, sustainability, cross-culture civil service management differences, and how ethical leadership shapes public sector human capital. Working through these fields would not only improve the theoretical foundation of studies in human capital in public sector

but also be beneficial in practice to policymakers who want to improve governance and public sector human resource management.

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