

Bibliometric Analysis of Key Findings in Studies on Gender Disparities in Education and Employment

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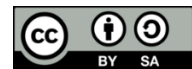
Gender Disparities

VOSviewer

ABSTRACT

This study employs bibliometric analysis to explore the evolving landscape of research on gender disparities in education and employment from 1985 to 2024. Utilizing VOSviewer for data visualization, we identified key thematic clusters, analyzed trends over years, and pinpointed less-researched areas that present opportunities for further inquiry. Our findings revealed that while traditional topics like wage disparities and labor market participation continue to dominate the research, newer areas such as the impact of global events (e.g., COVID-19) and intersectional identities on gender inequalities are gaining prominence. Notably, the analysis highlighted significant gaps in research related to poverty, household dynamics, and health care's role in gender disparities. These findings suggest a need for a more nuanced exploration of how gender disparities affect various socioeconomic outcomes and call for targeted research efforts in underexplored areas to develop a more comprehensive understanding of the issues at hand.

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1. INTRODUCTION

Gender disparities in education and employment have been long-standing issues attracting significant academic and policy-making attention [1]. Numerous studies have revealed that despite progress in some regions, substantial gaps remain, particularly in STEM fields and leadership roles across various sectors [2], [3]. The educational attainment of women and their participation in the labor market are crucial indicators of gender equality and economic development [4]. However, disparities persist due to socio-cultural norms, economic barriers, and policy

inadequacies, which differentially affect men and women globally [4].

In the realm of education, girls and women often face systemic barriers that limit their access to quality education and career opportunities [5], [6]. These barriers include but are not limited to, inadequate school facilities, gender-biased teaching and learning materials, and societal expectations that prioritize men's education over women's [7]. Although there has been a notable increase in the enrollment of girls in primary and secondary education, the transition to higher education and subsequent employment remains a significant challenge, leading to

underrepresentation in high-paying jobs and sectors [8], [9].

The employment sector mirrors these educational challenges, with women frequently encountering obstacles such as wage disparities, underrepresentation in senior and executive roles, and a lack of mentorship and professional growth opportunities [10]. Additionally, women are disproportionately affected by job insecurity and are often employed in sectors with less regulatory oversight and lower pay [11], [12]. These issues are compounded for women in developing countries where informal employment is prevalent, and legal protections are often lacking, making it essential to investigate these disparities thoroughly [13].

Despite the growing body of research on gender disparities in education and employment, there is a need for a comprehensive bibliometric analysis to synthesize existing studies and identify prevailing trends, gaps, and opportunities for future research. Current literature often focuses on isolated aspects of these disparities without a holistic view that integrates both education and employment contexts across different geographies and cultures. This research aims to fill that gap by providing a detailed overview and analysis of the key findings in existing literature.

The objective of this research is to conduct a bibliometric analysis of studies concerning gender disparities in education and employment. This analysis will map the evolution of research in this area, identify the most influential studies, the geographical distribution of the research, and emerging trends in the study of gender disparities. By doing so, the research seeks to highlight the critical areas where interventions are most needed and propose areas for future research.

2. LITERATURE REVIEW

2.1 *Overview of Gender Disparities in Education*

Gender disparities in education have been a focal point of academic research, with numerous studies illustrating how disparities

begin in early education and extend through to higher education and vocational training. Research indicates that socio-economic factors, cultural norms, and institutional policies significantly influence educational outcomes for women and men differently. For instance, a study by [5] highlights that in many developing countries, girls are less likely to be enrolled in school compared to boys, particularly in rural areas where economic constraints and traditional gender roles more profoundly affect educational opportunities. Further, UNESCO reports consistently show that girls who do attend school are more likely to drop out at the secondary level due to factors like early marriage, pregnancy, and the economic necessity for them to contribute to household labor.

2.2 *Gender Disparities in Higher Education and STEM Fields*

The underrepresentation of women in higher education, especially in STEM (Science, Technology, Engineering, and Mathematics) fields, remains a significant concern. Studies such as those by [14] have demonstrated that although there is nearly gender parity in the overall numbers in higher education, women are markedly underrepresented in most STEM fields globally. This disparity is not only a result of pre-college preparation but also of the climate and culture within STEM departments in universities, which often do not support the educational and professional advancement of women [15], [16]. Research by [17] further substantiates this by revealing implicit gender biases in faculty hiring, mentoring, and evaluation processes within academia.

2.3 *Gender Disparities in Employment*

Transitioning from education to employment, gender disparities

become more pronounced and multifaceted. A substantial body of literature has focused on the employment rates, types of employment, and the conditions under which women work. The International Labour Organization (ILO) has consistently documented that women, particularly in developing economies, are more likely to be engaged in part-time, temporary, or informal employment compared to men, which are often less secure and lower paid [18]. Moreover, research by [19] explores the gender pay gap, noting that women globally earn approximately 77% of what men earn for the same work when controlling for age, education, hours worked, and occupation.

2.4 Barriers to Professional Advancement and Leadership

Despite achieving higher educational levels, women face significant barriers in professional advancement, particularly in reaching leadership positions. Numerous studies have investigated the "glass ceiling" effect, a metaphor describing the invisible barriers that prevent women from achieving higher-level leadership roles. A seminal piece by [20] suggests that organizational practices, stereotypes about leadership, and a lack of professional networks contribute to this phenomenon. Additionally, research by [21] emphasizes the

importance of mentorship and sponsorship in advancing women's careers, highlighting that women are less likely than men to receive the same quality of mentorship or to have a sponsor who advocates and facilitates career advancements.

3. METHODS

This study employs a bibliometric analysis to systematically review and synthesize existing literature on gender disparities in education and employment. We utilized Google Scholar to collect publications from the past two decades. Specific search terms used included "gender disparities," "education," "employment," "gender wage gap," and "STEM education," among others, to ensure a comprehensive dataset. The inclusion criteria were peer-reviewed journal articles, conference papers, and books written in English. Exclusion criteria ruled out non-peer-reviewed articles, editorials, and publications not directly addressing the core topics of education and employment. The collected data were analyzed using VOSviewer software for creating and visualizing bibliometric networks. This analysis helped identify the most cited research, key authors, and prevalent themes and trends. Additionally, temporal trends were assessed to understand the evolution and current state of research on gender disparities in global contexts.

4. RESULT AND DISCUSSION

4.1 Data Metrics of Literature

Table 1. Research Data Metrics

Metrics Data	Information
Publication years	1985-2024
Citation years	39
Papers	980
Citations	169862
Cites/year	4355.44
Cites/paper	173.33
Cites/author	97100.07
Papers/author	547.57
Authors/paper	2.39

h-index	227
g-index	400
hI,norm	160
hI,annual	4.10
hA, index	56
Paper with ACC >=	1,2,5,10,20:744,647,501,361,201

Source: Output Publish or Perish, 2024

Table 1 presents a bibliometric analysis of the research data on gender disparities in education and employment from 1985 to 2024. The dataset includes 980 papers, accumulating a total of 169,862 citations over 39 years, averaging 4,355.44 citations per year and 173.33 citations per paper. The data indicates a robust academic interest and impact, as reflected by a high h-index of 227, suggesting that at least 227 papers have each been cited at least 227 times. The g-index is even more impressive at 400, indicating that the top 400 papers have together received at least 160,000 citations. The normalized individual h-index (hI,norm) is 160, and the annualized individual h-index (hI,annual) is 4.10,

both highlighting significant contributions by individual authors. The average number of authors per paper is approximately 2.39, illustrating collaborative efforts in the research field. The hA, index stands at 56, providing insight into the author-level productivity based on the square root of the total citations. Moreover, the paper distribution with accumulative citation counts (ACC) at thresholds of 1, 2, 5, 10, and 20 citations shows a substantial number of papers achieving these citation metrics, indicating widespread recognition and relevance of the research within the academic community.

4.2 Citation Analysis

Table 2. Most Cited Article

Citations	Author and Year	Title
4607	[22]	Rising tide: Gender equality and cultural change around the world
3943	[23]	Making choices for multicultural education: Five approaches to race, class and gender
3185	[24]	Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: Implications for entrepreneurship education
3094	[25]	Gender equality and women's empowerment: A critical analysis of the third millennium development goal 1
2653	[26]	The impact of COVID-19 on gender equality
2443	[27]	The gender revolution: Uneven and stalled
2186	[28]	Gender differences in pay
2182	[29]	Families that work: Policies for reconciling parenthood and employment
1917	[30]	Modernizing women: Gender and social change in the Middle East
1781	[31]	Dynamics of the gender gap for young professionals in the financial and corporate sectors

Source: Output Publish or Perish, 2024

Table 2 showcases the most cited articles in the field of gender disparities in education and employment, highlighting the significant impact and recognition

these works have garnered within the academic community. The most cited article, by Inglehart and Norris, titled "Rising tide: Gender equality and cultural change around the world,"

has received 4,607 citations, indicating its profound influence on understanding cultural shifts towards gender equality globally. Following closely, Sleeter and Grant's work on multicultural education explores the intersections of race, class, and gender, accumulating 3,943 citations, underscoring its relevance in shaping educational paradigms. The paper by Wilson, Kickul, and Marlino, which discusses the influence of gender on entrepreneurial self-efficacy and intentions, reflects a significant interest in the entrepreneurial outcomes related to education, with 3,185 citations. Other notable works

in the list, such as Kabeer's critical analysis of gender equality under the millennium development goals and research by Alon et al. on the impact of COVID-19 on gender equality, further emphasize the diverse yet interconnected facets of gender research. These studies collectively cover various aspects from policy implications to global cultural shifts and economic impacts, illustrating the broad scope and depth of research dedicated to understanding and addressing gender disparities.

4.3 Keyword Co-Occurrence Analysis

1. Network Visualization

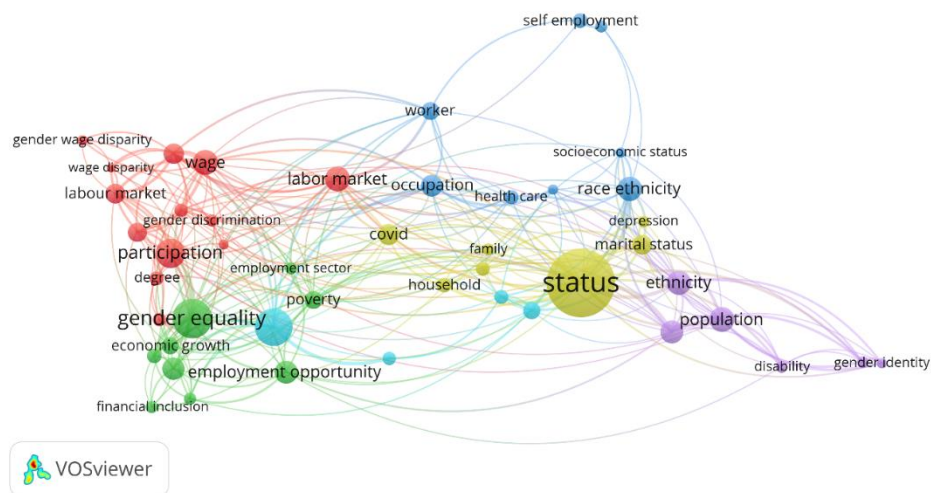


Figure 1. Network Visualization

Source: Data Analysis

The figure shows a network displays different clusters, each represented by various colors, indicating thematic focus areas within the broader context of gender disparities in education and employment research. The red cluster focuses on labor and wage disparities, featuring terms such as "gender wage disparity," "wage disparity," "labor market," and "gender discrimination." These terms are interconnected, suggesting a concentration on the economic aspects of gender disparities, particularly how they manifest in labor markets and wage

differences. This cluster highlights the ongoing issues related to equitable pay and employment conditions that disproportionately affect women in various sectors.

Moving to the green cluster, we see a focus on employment opportunities and economic growth with central terms like "gender equality," "economic growth," "employment opportunity," and "financial inclusion." This cluster explores the broader economic impacts of gender equality, emphasizing the role of gender parity in fostering economic development

and creating equitable employment opportunities. It suggests a positive correlation between gender equality and overall economic advancement, underlining the importance of inclusive policies and practices.

The blue cluster addresses employment conditions and socioeconomic factors, featuring terms such as "self-employment," "worker," "socioeconomic status," "race ethnicity," and "health care." This cluster points to the diverse factors influencing employment conditions and highlights the intersectionality of gender with other social identifiers like race and socioeconomic status. It explores how these factors collectively impact employment scenarios, showing the

complexity of challenges faced by individuals at these intersections.

Finally, the yellow cluster focuses on status and sociodemographic factors. Dominated by the central term "status" and surrounded by "marital status," "ethnicity," "disability," and "gender identity," this cluster delves into how various status and identity factors influence gender disparities. It examines the role of demographic and social identifiers in shaping experiences in both educational and employment contexts, indicating that personal and social identities significantly impact individuals' opportunities and barriers.

2. Overlay Visualization

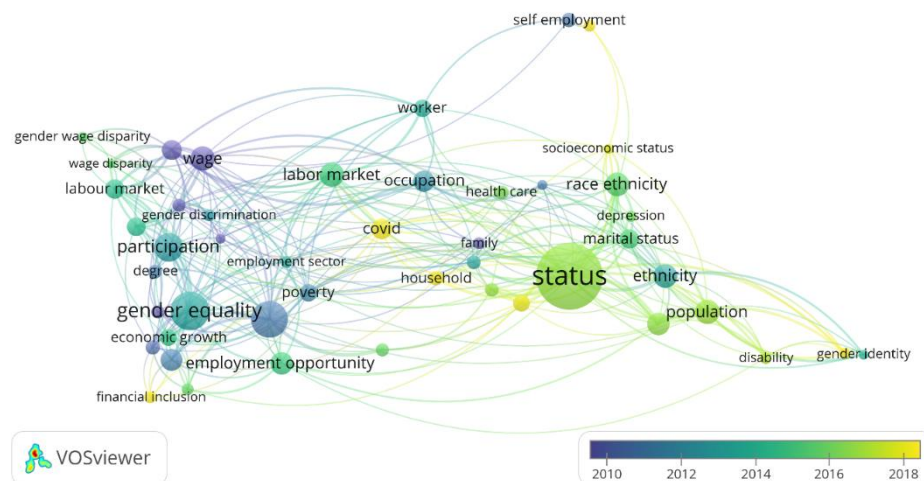


Figure 2. Overlay Visualization
Source: Data Analysis

The second figure above, showing a bibliometric network with temporal coloring, illustrates how the thematic focus of research on gender disparities in education and employment has evolved over time, spanning from 2010 to 2018. The color gradient from blue to yellow indicates the timeline of research emphasis within each cluster.

The early part of the decade focused significantly on traditional topics such as "gender wage

disparity," "labor market," and "gender discrimination." These areas are marked in darker blue, indicating they were highly prominent during the early 2010s. Initial discussions around "economic growth" and "employment opportunity" related to gender equality also began during this period, suggesting an integration of gender issues into broader economic analyses.

As the timeline progresses towards green tones around the mid-

2010s, there's a noticeable shift towards exploring the impacts of "status," which encompasses a broader range of sociodemographic factors including "marital status," "ethnicity," and "disability." This shift reflects a growing awareness and analysis of intersectionality in gender disparity research. The green tones also show an increased focus on "self-employment" and "worker" status, indicating a pivot towards the types of employment and conditions under which different genders operate, possibly influenced by growing trends in gig economy and entrepreneurial research during this time.

In the later years, leading up to 2018, there is an evident focus on issues such as "COVID" and its implications on gender disparities within the "family" and "household" contexts, which are colored in lighter green to yellow. The inclusion of COVID-19 related research signifies a rapid integration of current events into academic inquiry, reflecting the pandemic's significant impact on gender dynamics in employment and

domestic roles. The evolution towards yellow also highlights a growing emphasis on "health care" and its intersection with employment and socioeconomic status, suggesting a more nuanced understanding of how health-related factors influence gender equity in the labor market.

The transition in color and clustering in the visualization from 2010 to 2018 demonstrates an evolution from more traditional studies on wage disparities and labor markets to more complex analyses that incorporate socio-economic status, health, and recent global events like the COVID-19 pandemic. This shift reflects broader trends in the social sciences, where there is an increasing emphasis on understanding the multifaceted impacts of socio-economic and global health phenomena on gender disparities. The network indicates not only a diversification of topics but also a deeper exploration of how various factors intersect with gender to influence educational and employment outcomes.

3. Density Visualization

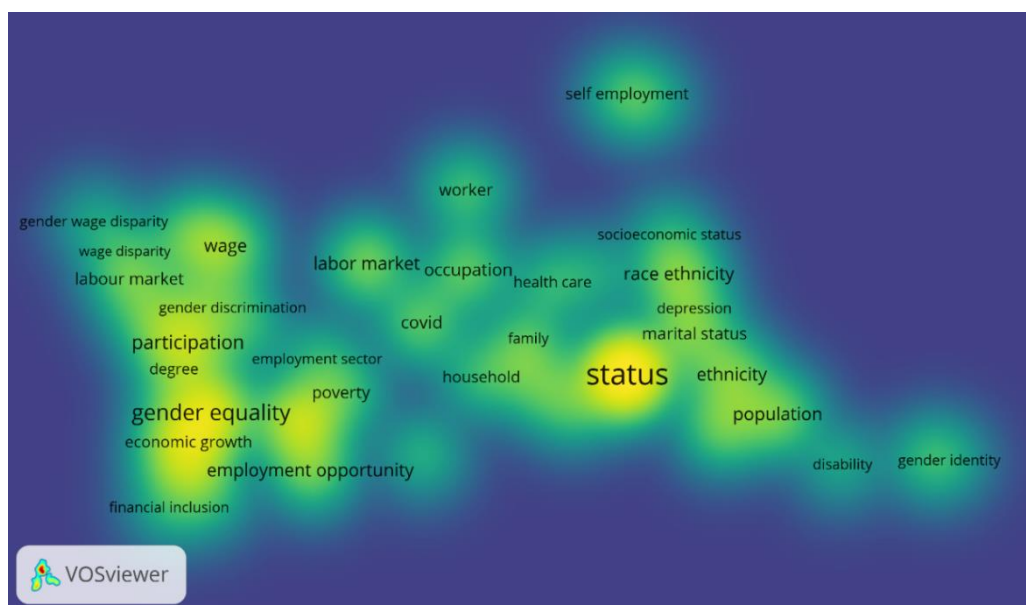


Figure 3. Density Visualization
Source: Data Analysis

This last figure represents a density visualization from VOSviewer, mapping the frequency and intensity of keyword occurrences related to gender disparities in education and employment research. The varying brightness of the areas indicates the relative concentration of research activity, with brighter areas signifying higher density and darker areas indicating less research concentration.

The bright areas of the map, particularly around terms like "gender wage disparity," "gender equality," and "status," signify well-researched areas with a high concentration of literature. These zones represent established fields of study where extensive research has already been conducted, focusing on major themes such as wage disparities, socioeconomic status, and broader concepts of gender equality. The prominence of "status" connected to "marital status," "ethnicity," and "disability" in brighter zones highlights the intersectional approach prevalent in current research, exploring how various identity factors intersect with gender disparities in both education and employment.

The darker areas around keywords like "poverty," "household," and "family" suggest these are less saturated research areas within the broader context of gender disparity studies. Despite their crucial relevance to understanding the full impact of gender disparities on economic and domestic spheres, these areas may not have received as much academic attention. The less bright area around "health care" also indicates a potential gap. While health care is crucial for understanding employment and education outcomes, especially for women, its relatively darker shading suggests that it might not have been

integrated comprehensively into gender disparity research, particularly in relation to how health care access and quality impact economic and educational opportunities for different genders.

The less bright areas in the visualization present opportunities for further research. For example, exploring how "poverty" intersects with gender disparities could provide deeper insights into the cyclical nature of gendered economic disadvantages. Additionally, focusing on "household" dynamics and their impact on gender roles could unveil critical understandings of domestic labor division and its implications for educational and employment opportunities.

Moreover, expanding research on "health care" within the context of gender disparities could address critical issues such as the impact of health care accessibility on women's economic participation and educational attainments. Studies in this area could examine how different health policies affect gender gaps in various regions, potentially guiding more effective policy interventions.

5. CONCLUSION

The bibliometric analyses provided in the series of visualizations using VOSviewer offer a comprehensive overview of the thematic clusters, research trends, and opportunities within the field of gender disparities in education and employment. Initially, we identified distinct thematic clusters that signify concentrated areas of research such as labor and wage disparities, employment conditions, and sociodemographic impacts, each highlighting the multifaceted nature of gender studies. Subsequently, the exploration of research trends over the years revealed a dynamic shift in focus areas—from traditional topics like wage disparities to more complex issues including the impact of COVID-19 and

intersectional identities on gender inequality. Lastly, the identification of less saturated research areas such as "poverty," "household," and "health care" in the latest density visualization indicates significant opportunities for future studies. These areas are less explored and represent potential for substantial academic and practical contributions, suggesting that while much has

been covered, considerable gaps still exist that require further scholarly attention to fully understand and address the complexities of gender disparities in global contexts. This series of insights underscores the importance of continuous and evolving research efforts to adapt to emerging trends and fill existing knowledge gaps for more informed policy-making and societal advancement.

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