

## Gender Inequality in Higher Education and Research

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**Abstract:** *Significant economic and social differences in the living and working conditions of men and women, structural changes in society actualize the need to research the prerequisites and consequences of the existence of gender inequality in the country. The purpose of the paper is to investigate the causes and nature of gender inequality in the long term. The object of the research is the sphere of education and science of certain countries of Europe and America, Southeast Asia, the Middle East and North Africa. The main hypothesis of the study is the assumption of a relationship between gender inequality in the field of education and indicators of the country's social development (Human Development Index and level of education). Methodological tools of the conducted research are methods of trend and structural analysis. The information base of the research is data from the Organization for Economic Cooperation and Development, the World Economic Forum, and the United Nations, the research period is 1950-2021. The results of the analysis of the Gender Equality Index during 1950-2000 in terms of its four dimensions (health, socio-economic resources, gender disparity in households and gender disparity in politics) proved the presence of a significant gender gap in some countries of the world: the countries of Eastern and Western Europe are more developed compared to other regions of the world (South and Southeast Asia, the Middle East and North Africa). According to the results of empirical calculations, the dependence between the level of human development and gender inequality has been proven: the higher the level of human development of the country, the lower the inequality in education. The study of gender inequality in the field of scientific research was carried out based on the analysis of publications in 50 international journals, book collections of Bengal Economic Association, Indian Economic Association and other professors of reputed institutions in India and abroad. Based on the results of the analysis, it was concluded that the publishing activity of women is lower than that of men: only 22.07% of publications in national and international journals, 23.65% of volumes of book collections and 27.90% of book chapters were published by women. The reasons for the low activity of women in the field of scientific research include: low opportunities for visiting the sites of scientific research institutions, field surveys or laboratory work; limited opportunities for training and advanced training at seminars and classes; lack of time to carry out research activities; discrimination based on personal interests and gender bias; much less interest in regular research due to social, psychological and physical reasons; excessive family load, etc.*

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## Introduction

Gender inequality exists when there is discrimination between men and women to provide access and opportunities in social, economic, and political systems and differentiate women from men in empowering societal decision-making processes. In other words, the Global Gender Gap Report-2008 expressed that gender inequality is the outcome of the persistent discrimination of a particular group of people who are stronger in race, culture, politics and economics over other groups. There are ten causes of gender inequality such as uneven access to education, differential employment opportunity, job discrimination, differential treatment of legal protection, insufficiency of bodily autonomy, poor medical facility, deficiency of religious freedom, shortage of political representation, racism and societal attitude (Soken-Huberty, n.d.).

Sen (1992) theorised that intrahousehold division of income differentials, resource use and the transformation of the used resources into the capability to function leads to gender inequality. More explicitly, it is a fact that rural women in Asia and North Africa are differently treated against men. Differential female deprivation of extraordinary proportions, attainment inequality and shortfall inequality were reflected by observed morbidity and mortality rates. In Sub-Saharan Africa, gender difference exists due to incapability of reading and writing, inferiority of leadership and low quality of upgrading independent careers etc. There are many causes of gender inequality, particularly poverty, literacy, unemployment, social customs, beliefs and practices, social attitudes, lack of awareness of women, etc. Most causes produce violence against women and provoke differential power between men and women in society. In all communities of the world, these imbalances exist in various degrees. Generally, it is stated that in the education system, gender inequality evolves from sex discrimination during educational careers throughout the life span (Manjulata & Sapna, 2018).

Presently, the global gender gap stood at 68.4% in 2023 for all 146 countries (educational attainment is 95.2%), in which Europe constitutes 76.3%, followed by North America 75%, Latin America and the Caribbean 74.3%, Eurasia and Central Asia 69%, East Asia and the Pacific 68.8%, Sub-Saharan Africa 68.2%, Southern Asia 63.4%, Middle East and North Africa 62.6% respectively. According to rank, the top 4 countries are Iceland, Norway, Finland, and New Zealand, whose indexes are 0.912, 0.879, 0.863 and 0.866. India ranks 127th, having an index of 0.643, below Bangladesh, Nepal and Bhutan, and the lowest rank is occupied by Chand (146th) followed by Afghanistan (145th). In the education inequality index, India stood 26th, whereas Argentina ranks first. In the gender gap regional comparison, in Euro Asia, Moldova ranks one with an index 0.788. New Zealand stood the first rank in East Asia and the Pacific, with 0.856 as an index. In Latin America and the Caribbeans, Nicaragua achieved first rank, having an index 0.811, in Middle East and North Africa, UAE stood first with an index 0.712, in North America, Canada kept first rank with an index 0.770, in South Asia, Bangladesh achieved rank one with 0.722 followed by Bhutan, Sri Lanka, Nepal, Maldives and India, in sub-Saharan Africa, Namibia achieved first rank having index of 0.802, and Chand ranks last (146th) with index 0.570 respectively (World Economic Forum: Global Gender Gap Index, 2023).

According to the OECD, 71% of male science graduates in Physics, Mathematics and Engineering, compared to 43% of female graduates, work as professionals. In high school and colleges, Sex discrimination is very high, and women are not qualified in high salaried jobs. Sex discrimination in education also leads to females being more submissive, soundless, and less self-confident due to the hidden curriculum (Wikipedia, n.d.). In a press release, UNICEF (n.d.) mentioned that globally, 129 million girls are not going to school, where 32 million are primary school students, 30 million are lower-secondary school students, and 67 million are upper-secondary school students. Gender parity in primary schools exists in only 49% of countries compared to 42% in lower secondary education and 24% in upper secondary education, but the gaps increased at the secondary level.

Based on the trends of the historical Gender Equality Index during 1950-2000 among the world regions on the four dimensions of health, social-economic resources, gender disparities in households and gender disparities in politics and the scores which are depicted in Figure 1, it is found that Eastern and Western Europe have progressed speedily in comparison to other regions. However, South and South-East Asia, the Middle East and North Africa lagged far behind and scored lowest. Latin America showed a steep increase in equality.

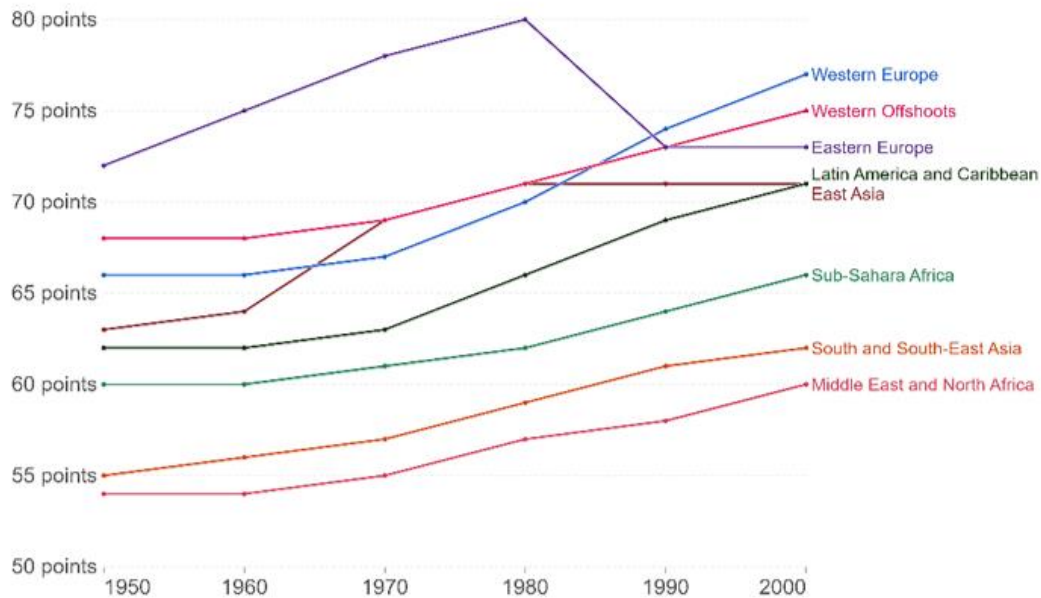


Figure 1. Historically Gender Equality

Source: OECD (2014)

Moreover, it was found from the regional gender equality and their trends during 2006-2023 that Europe and North America have been increasing faster than other regions in gender equality, followed by Latin America and East Asia, where the Middle East, North Africa and South Asia have been increasing too slow with lowest ranks (Figure-2).

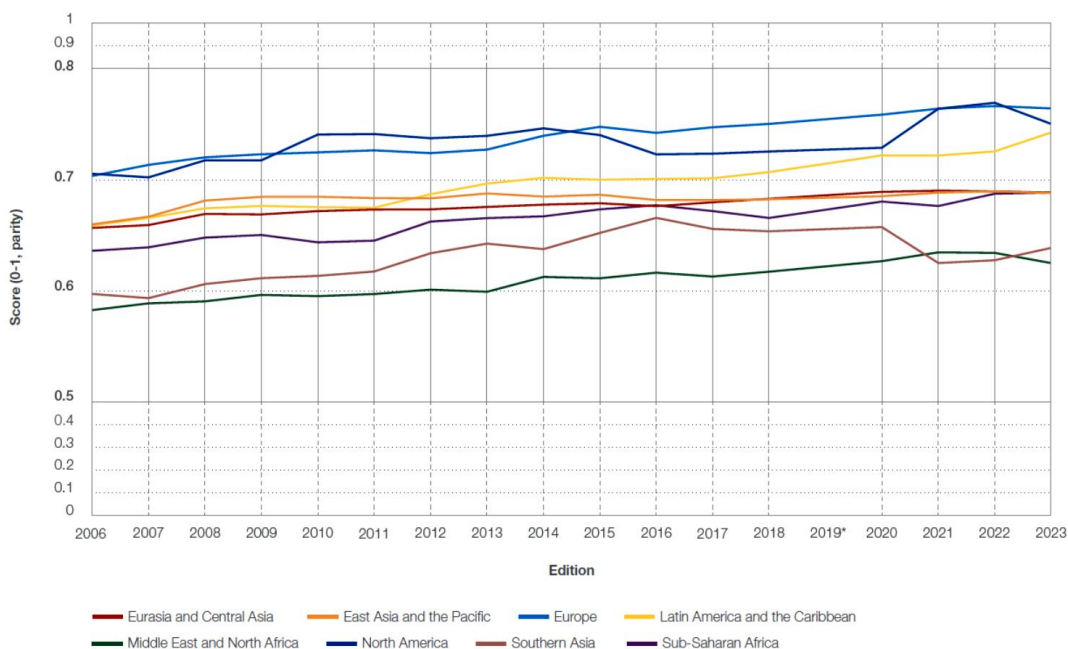


Figure 2. Trends of Regional Gender Gap

Source: World Economic Forum, 2023

In an academic research area, based on the regression analysis in the USA, among 1000 people, it was found that there is a positive relation between the female researchers (% of total) and the gender inequality index, and their correlation was found as 0.21 (Cabolis, 2018). Research revealed that 31.65% of published articles prior to 2008 and 31.71% of published articles during 2008-2015 were identified as gender-biased while examining the publications of peer-reviewed articles in 2534 journals during 2008-2015 (Cislak, Formanowicz, & Saguy, 2018).

Another important study revealed that male researchers perceived greater gender equality in their department than females, where the UK is better off. Spain felt greater gender inequality in allocating resources related to professional development than in the UK. Women's representation in academic senior positions is 44% in the UK compared to 41% in Spain. More significant bias is also influenced in the process of decision-making. This study was done by García-González, Forcén, and Jimenez-Sanchez (2019), who applied Principal Component Analysis using two-way ANOVA models verified by the Cronbach Alpha test and Cohen's *d* test among 1295 researchers in the UK and Spain from 5th February 2018 to 4th May 2018 about perception on gender equality.

In this existing scenario of gender inequality in education, the author endeavours to express the nature and long-term structure of gender inequality in education, especially in higher education and research and tried to explain the relationship between human development and gender inequality and other indicators emphasising a case study of women role on publication in research and showed the causes of incapacibilities of female researchers. Also, the paper studies the policy recommendations for improving the gender gap in higher education and research.

## Literature Review

The research of Klasen and Lamanna (2008) revealed that gender inequality in education and employment generally reduces economic growth, examined during 1960-2000 through cross-country and panel regression analysis across the world's regions. Nmadu, Avidime, Oguntunde, Dashe, Abdulkarim and Mandara (2010) stated that the Gross Enrolment Ratio (GER) of primary school in Northern Nigeria in 2008 was 117% for males compared to 87% for females where the Gender Parity Index was 0.74. The general dropout rate was observed as 4%, in which the boys' rate is 3% and the girls' rate is 5%. The primary school completion rate for boys was 64% compared to 36% for girls. Reeves, Buckner and Smith (2021) showed that in 2017-18, girls graduated more than boys in all 37 states of the USA. Graduation completed 88% girls and 82% boys, where 89% were white and 79% were black students, while Hispanic and white students were 89% and 81%, respectively. The graduation rate for boys of economically disadvantaged students was 80% compared to 82% for the richer class.

Hao, Zhang, and Yu (2021) used Chinese General Social Survey (CGSS) data from 2015 and applied the methodology of Blinder-Oaxaca decomposition on overall gender disparities in rural education and found that the average variation between rural men and women spent on education in terms of years was 1.598. Then, the significance test was done (*P* (probability) is significant where the characteristic difference is 0.643, and the total difference is 40.24%) and was found to be 40.24%. Such variation occurred due to changes in demographic variables: age, marriage and nationality, differences in income, health status, perception of class level and educational status of parents, etc. It states that if characteristics of rural women and men are identical, then their education will catapult by 0.643 years, where the coefficient difference was observed as 75.22%, the interaction item for the rest was -15.46% of total difference, income factor was found as 53.73%. The marital status on gender imbalance in rural education was 9.27%, respectively. The educational attainment of fathers and mothers affected rural education by 6.10% and 3.39%, respectively, while the age affected by 4.67% of the characteristic difference but for 190.22% of the coefficient difference. There is a positive significant impact of political status, income, self-rated social stratum, and parents' educational qualification on education by gender in all quantiles.

EU Commission (n.d.) found that women are achieving PhD graduate level, which has increased from 24.1% in 2018 to 26.2% in 2021 in the EU. However, women still face inequality in the research arena in several academic institutions, decision-making positions, publications, citations, patents and industry collaborations. EU is sanctioning funds to address gender inequality and foster inclusiveness to ensure equal opportunities for everyone.

Tzilivakis (2022) stated that Gender Equality Plans (GEPs) of the EU Commission has been working on sanctioning funds amounting to Euro 95.5 billion for research and innovation programme at higher education institutions which must have a Gender Equality Plan in place following the 2020 structural change project TARGET which introduced a reflexive policy and tools for each stage of the Gender Equity Plan such as from planning and implementation to monitoring and self-assessment. European Institute for Gender Equality(2016) explained that the Gender Equality Plan could create (1) a structural change in research area as well as in research organisations evaluating qualitative and quantitative indicators and with a good monitoring system implementing designed action toolbox(gender sensitive PhD supervision, gender equality



workshops, project drafting and management, ensure greater visibility of women researchers, compulsory awareness-raising sessions, teaching free periods, family leave, maternity cover fund, gender-integrated leadership programme, preventing sexual harassment, gender lectureship, preparing gender report),(2) It needs legislative and policy background and key resources.

Huang, Gates, Sinatra and Barabási (2020) proved that the Web of Science (WoS) recorded 7,863,861 publications in which 83 countries in 13 major disciplines identified 3 million authors where 856889 were female and 2146926 were male during the period from 1900 to 2016. It was found that the careers of 412,808 females and 1,110,194 males ended between 1955 and 2010 when only 33% of papers were published. Only 27% of authors are women. On average, male scientists have published 13.2 papers during their careers. On the other hand, female authors have published only 9.6 papers where the gender gap in total productivity was 27%. Male scientists received 30% more citations than female scientists in the case of publications. In addition, the top 20% of impacted male authors have received 36% more citations than female. A strong correlation (where Pearson correlation = 0.80) was found between the career-length gap and the career-wise productivity gap if we classify scientists by discipline and country. It clearly states that when there is a large gender difference in the career length by discipline or country, there will be a significant gender difference in total productivity.

Applied Physics occupy the smallest gender gap in career length (2.6%) compared to biology and chemistry (19.2%), producing a total productivity gender gap of more than 35.1%. Note that 9.0% of active male scientists stop publishing each year compared to 10.8% of active females. Casad, Franks, Garasky, Kittleman, Roesler, Hall and Petzel (2020) examined that the progress toward gender equality in STEM is slow, where gender disparities worsen while the number of women postgraduate degree holders has increased in recent years. It has adverse effects on women's career advancement. The author identified three factors contributing to gender inequalities and women's departure from academic STEM fields. The factors are as follows: stereotype representation, which is less insufficiency of social networks and bleak academic climates where the National Science Foundation took measures of recruiting diverse applicants (e.g., training search committees), mentoring, networking, and professional development (e.g., promoting women faculty networks); and developing academic environment (e.g., educating male faculty on gender bias).

Following the Effectively Maintained Inequality (EMI) theory, taking data from the China College Student Survey 2012, Luo, Guo and Li (2021) examined and found that gender equality in higher education in China has been improved and found no significant gender gap in the access to national elite universities (according to “Project 985” universities) nor to top elite universities (according to C9-league universities). Liu, Holme, Chiesa, AlShebli and Rahwan (2023) found that 81,000 editors have worked in more than 1,000 journals on 15 subjects during the last 50 years, in which only 26% of authors are women. They also found that 14% of women belong to editors, and 8% belong to Editor-in-Chief. Explaining Career length implies that the gender gap exists among editors but not among the editors-in-chief. Moreover, among the publication records of 20,000 editors, it was found that at least one-fifth of the papers were published by 12% and one-third of their papers were published by 6% in their edited journals.

**The Purpose of the Paper.** The central objective of the paper is to focus on gender inequality in education, especially in higher education and research in various regions of the world and to search out the causes of the long-term structure of inequality, to relate human development and gender inequality and to find out the proper policy prescriptions suggested by international institutions. Also, the author conducted a case study of women's role in publication in research and explained the causes of incapacibilities.

## Methodology

In this paper, the author used the data, trend lines and other facts on gender inequality, especially on higher education from OECD (2021), World Economic Forum, 2023, World Economic Forum: Global Gender Gap Index, 2023, UNICEF Report, Human Development Report, Inequality adjusted education Index, 2021 respectively. In a case study of gender inequality in research, the author used 50 international journals, book collections of the Bengal Economic Association and Indian Economic Association and books of other professors of reputed institutions in India and abroad. The author also analysed the causes, structural change, and international policies of gender inequality in higher education and research using innumerable references.

**Causes of Gender Inequality in Education.** Jacobs (1996) emphasized that gender inequality in higher education generally occurs due to social class and ethnicity inequality. Clark (1992) assumed that the higher the multi-national investment in a developing country, the lower the provision of higher education for girls. Salik and Zhiyong (2014) argued that gender inequality and discrimination in higher education may reduce economic growth and gender development and preserve poverty and vulnerability in society. Rosa Clavero (2022) exposed that the main reason for gender inequality in higher education and research is that men empowered hegemonic roles in academic systems while women played as subordinates.

Silander et al. (2013) examined that in higher education, gender inequality is vertically and horizontally segregated in which male and female-dominated disciplines are different. Therefore, the way of solutions requires differential treatments. Karak and Sen (2017) focussed on gender inequalities in multidimensional Indian education systems where gender discrimination exists in economic, social, cultural and legal areas. The author examined it by explaining the Women's Economic Opportunity Index, which defines women's economic opportunity. The index consists of laws, regulations, practices, customs and attitudes that enable women to participate in the workforce under conditions of equality with men as a wage-earner or employer of wage earner. The Women's Economic Opportunity Index has 29 determinants, which were collected from various sources, including the UN and the OECD.

World Bank (2023) studied that in the world competition, girls lag behind boys in all levels of education, in which it was estimated that the prime barrier for girls in competing 12 years of education is 15 trillion dollars and lost lifetime productivity and earning is 30 trillion dollars. Thus, poverty is the prime barrier because 72% of girls from the richest quintile families completed primary school education compared to 34% from the poorest quintile families in 24 low-income countries. Globally, 129 million girls are out of school, where 32 million are in the primary level, 97 million are in the secondary level, where South Asia comprises 46 million and 52 million are in Sub-Saharan Africa. In low-income countries, 90% completed the primary level, where 36% of girls and 44% of boys completed the secondary level. Two-thirds of the world's illiterate population are women. Learning Poverty measure showed that the average of Learning Poverty in Low and Middle-Income Countries indicates that boys are 59% compared to 55% for girls, where the difference is lower in low-income countries since the average Learning Poverty was 93% for both boys and girls.

British Council (2021) found from its research that the Female Gross Enrolment Ratio of Andhra Pradesh is 29% against for all categories at 32.4% in the GPI in higher education stood at 0.81 where the GPI for SC students stands higher at 0.84 while for ST students it is lower at 0.76 which has increased marginally from 2011-12. The causes of these trends are increased cost of higher education, no good employment opportunities, lack of motivation, difficulties to habituate in English, etc. The teaching staff is male-dominated (Only 35 per cent of faculty in higher education in Andhra Pradesh are female), which is the serious causes to take advantages of female students in free participation. Slaughter (1993) argued that men dominated colleges and universities while women faculties are less because the proportions of women PhD holders are limited, which affects the number of women high achievers.

**Human Development and Inequality in Education.** The human development index is positively related to the education index. Generally, high human development countries should have higher education index, although there are exceptional countries. In Figure 3, the linear trend lines of countries with every group of human development countries from 1990 to 2021 have shown that Switzerland (S), a very high human development country, has been improving its HDI because of increases in all indicators. Albania (A) as a high human development country, the Philippines (P) and India (I) being medium human development countries, Tanzania (T) and Niger (N), being low human development countries, have been able to increase their HDI but the rate of increase is showing slow after 2018.

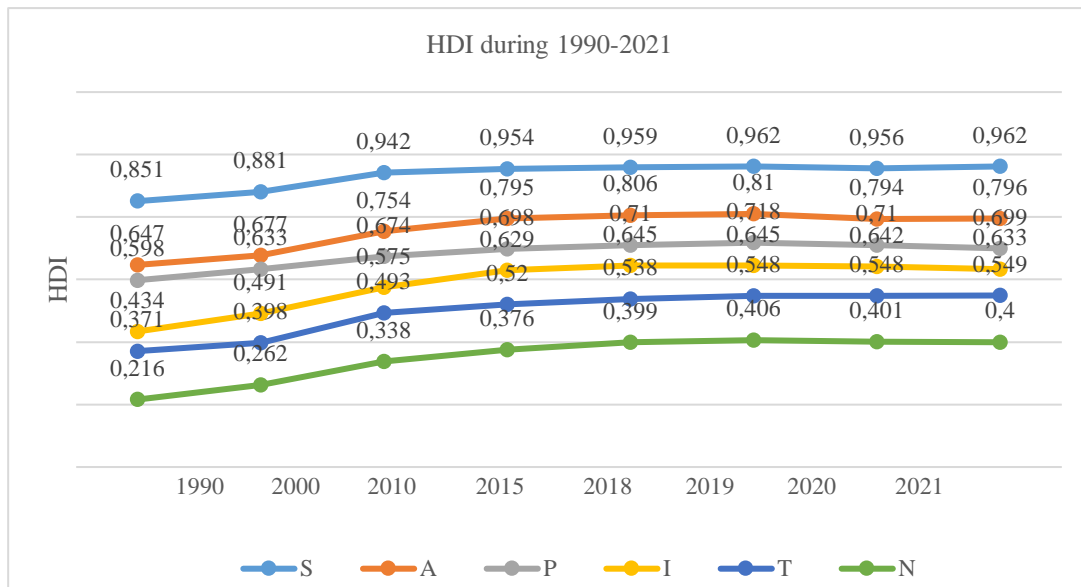


Figure 3. HDI Trends

Source: Compiled by the author

Generally, the higher the HDI, the higher the education index. However, when gender inequality is adjusted with the education index and thereby in the human development index, then the scenario must change. For example, Switzerland ranks one in HDI. However, it ranks third when gender inequality is adjusted because the difference in secondary pass level between males and females is 0.6. However, this difference shows 0.1 in the case of Denmark which ranks one in the gender inequality index. In high human development countries, North Macedonia ranks 37, securing 0.134 in the gender inequality index, with a difference of secondary pass level between males and females is 13.2. However, Mexico ranks 75, securing 0.309 in the gender inequality index, showing only 1.6 as the difference in secondary pass level between males and females. In medium human development, Tajikistan ranks 68, having 0.370 as the gender inequality index and 1.1% as the difference in secondary pass level between males and females. India ranks 122 with 0.490 as the gender inequality index, but its difference in secondary pass level between males and females is 12%. In low human development countries, Yemen ranks highest at 170, having a gender inequality index of 0.820, with the difference in secondary pass level between males and females is 15.1%. Among them, Ethiopia's index is good at 0.520 and ranks 129, with a difference in the secondary pass level between males and females of 11%. Therefore, in every country with high human development, gender inequality is very low, with a minimal difference in passing level of education between males and females. The opposite is true in the case of low human development countries. However, in medium human development countries, there are mixed observations in the gender equality index and differences in male-female education level (Table 1).

Table 1. Gender Inequality Index and Educational Level

Countries	Gender Inequality index	Rank (2021)	At least secondary level pass	
			Female (%)	Male (%)
<b>Very high human development</b>				
Denmark	0.03	1	95.1	95.2
Norway	0.06	2	99.1	99.3
Switzerland	0.018	3	96.9	97.5
<b>High human development</b>				
North Macedonia	0.134	37	61.9	75.1
Bosnia-Herzegovina	0.136	38	82.7	94.0
Albania	0.144	39	95.4	93.0
China	0.192	48	78.3	85.4
Cuba	0.303	73	89.5	91.9
Mexico	0.309	75	65.1	66.7
<b>Medium human development</b>				
Tajikistan	0.370	68	93.5	94.6
Bhutan	0.415	98	23.6	32.3
India	0.490	122	41.8	53.8
Bangladesh	0.530	131	50.6	58.5

Table 1 (cont.). Gender Inequality Index and Educational Level

<b>Low human development</b>				
Ethiopia	0.520	129	9.1	20.1
Niger	0.611	153	9.2	15.2
Yemen	0.820	170	22.4	37.5
Mali	0.613	155	8.0	15.5
Nigeria	0.680	168	40.4	55.3
Pakistan	0.534	135	22.1	28.7

Source: HDR-2021-22

One should note that in every high human development country, the lowest inequality in education exists in Czechia, showing 1.3%, followed by Slovakia – 1.7%, New Zealand – 1.8%, and Russia – 2.0 %, etc. However, the inequality-adjusted education showed differently where New Zealand’s rank is the highest, having 0.914, followed by Finland, Switzerland and the UK, respectively, whose inequality-adjusted education indexes are observed as 0.914, 0.907, 0.902 and 0.901, respectively. The exception is that Egypt belongs to a very high human development country, but its inequality is highest in that group, showing 22.1%, and its inequality-adjusted education index becomes only 0.522. In high human development countries, Uzbekistan achieved minimum inequality in education of 0.6% with an inequality-adjusted education index of 0.739. However, Egypt showed the highest inequality in education at 36.9%, with an inequality-adjusted education index of 0.443. In medium human development countries, Kyrgyzstan showed the lowest education inequality, with 3.4% only having an inequality-adjusted education index of 0.721.

On the other hand, Bhutan showed the highest inequality in education at 48.2%, with an inequality-adjusted education index of 0.279. India’s inequality education is 36.9%, and the inequality-adjusted education index is only 0.348. In low human development countries, Tanzania occupied 27.0% of inequality in education and achieved 0.342 as the inequality-adjusted education index. On the other hand, Guinea’s inequality in education showed 50.1%, and the inequality-adjusted education index becomes only 0.172. Thus, inequality in education plays a pivotal role in human development, ultimately creating barriers to sustainable development (Table 2).

Table 2. Inequality in Education

<b>Very high human development</b>	<b>Inequality in education (%)</b>	<b>Inequality adjusted education index (2021)</b>
Czechia	1.3	0.868
New Zealand	1.8	0.914
Slovakia	1.7	0.819
Russia	2.0	0.846
USA	2.7	0.883
UK	2.8	0.901
Canada	2.5	0.893
Finland	2.4	0.907
Australia	3.1	0.896
Switzerland	2.0	0.902
Kuwait	22.1	0.522
<b>High human development</b>		
Uzbekistan	0.6	0.739
Fiji	2.6	0.753
Armenia	2.9	0.720
Ukraine	3.6	0.758
Egypt	36.9	0.443
<b>Medium human development</b>		
Kyrgyzstan	3.4	0.721
Venezuela	8.7	0.663
India	36.9	0.348
Bhutan	48.2	0.279
Nepal	41.1	0.311
<b>Low human development</b>		
Guinea	50.1	0.172
Tanzania	27.0	0.342
Pakistan	43.5	0.221
Niger	35.0	0.172
Gambia	47.0	0.221

Source: HDR-2021-22



**Gender Inequality in Research: A Case Study.** The author owns 50 journals of national and international levels, where 829 authors have contributed their articles, 183 of which are authored by women, which amounts to 22.07% only. The author has collections of edited books by the Bengal Economic Association, Indian Economic Association and other academic professors of reputed institutions in India and abroad whose total volumes are 78, in which there are 422 women authors out of a total of 1784 authors where the author of this article is among authors in each volume. Therefore, the percentage of women's contributions is recorded as 23.65%, implying poor performance and low productivity. The author has edited seven books, including as co-editor in 3 books where female authors contributed 36 papers out of a total of 129 authors, which implies that women contributed only 27.90%.

There are many reasons behind the publications of women being less than men:

- Women found fewer opportunities to read books and references and prepare research notes. They have little scope to visit sites of research institutions, field surveys, or lab works. They get rare scope to avail training in research and publications and to increase skill development at workshops and classes. Generally, married women have little scope/less time for research work due to spending time in household life in household work to maintain responsibilities for their kids and their husbands. Despite engaging in academic institutions, they get little time for regular work and studies in research work or forthcoming innovations of research.
- Quality of work differs from the men on an aggregate level due to structural inefficiencies in developing the research opportunities.
- Discrimination for vested interest and gender biasness.
- Women feel less interest in keeping with regular higher studies for research due to social, psychological and physical causes.
- Sometimes, they have less availability of resources.
- Economically, women sacrifice less money for research work due to less income earned and overburdened by family.
- Intelligence diminishes more rapidly in women than in men.

Huang et al. (2020) examined that, on average, male scientists publish 13.2 papers during their careers compared to female authors (9.6 papers), producing a 27% gender gap in total productivity. The top 20% of productive male authors publish more than 37% of papers than females. OECD (n.d.) reported that women researchers are around 40 per cent of all researchers. 23% live in Luxembourg, and 56% live in Lithuania. According to the International Survey of Scientific Authors, only 30% of authors are women, and female researchers get less opportunity to enter and to carry forward in their research fields. The nature and characteristic of such type of gender gap varies significantly across research areas. In the Social Sciences and Psychology, 45% of researchers are women, and in Physics and Astronomy, only 15% are women. Even the earning of women authors is significantly less than that of the male authors, which accounts for 5-6 per cent. It was not found that the quality of research of females is much lower than that of males. Even male authors' citations are not higher than those of female authors in many prestigious journals. However, there is a wide gender wage gap, visible in engineering and computer sciences (27%) and senior management positions (15 %).

**Discussion on Policies.** Convention on the Elimination of all Forms of Discrimination against Women (CEDAW) in 1979 and the Beijing Declaration and Platform for Action 1995 took initiatives to take legislative action towards gender equality worldwide. Already, 131 countries implemented 274 legal and regulatory reforms towards gender equality. In Article 10, CEDAW initiated signatories to initiate appropriate measures to eliminate discrimination against women to guarantee equal rights of women with men in education. Overall, 90 countries prohibited gender discrimination in their constitutions.

The Council of Europe recommended combating gender stereotypes in education from higher education to teachers' training, integrating a gender equality perspective in the education system, and publishing expert studies on the above policies. Scottish government implemented taskforce in education and learning to identify measures in the lack of gender equality, seek and consider the views of girls and young women, identify good practices and barriers in planning and delivery of gender equality in education and identify gaps strategically and establish measures and to take an intersectional approach.

British Council recommended 12 policies, particularly, 1) emphasise gender mainstreaming, 2) improve gender expertise, 3) guarantee an intersectional appraisal, 4) take steps on violence against women, 5) mobilise female representation in higher education leadership, 6) tackle subject segregation, especially in STEM, 7) initiate online learning and collaboration, particularly for women, 8) strengthen organisational leadership and commitment to enrich gender equality in strategic policy, quality assurance and delivery, 9) approve and spread gender studies and increase higher education institutions for women, 10) start a lifecycle approach, 11) adopt the centrality of equality and excellence and 12) take action at scale (Mott, 2022).

In the planning process, it is necessary 1) to identify institutional weaknesses, 2) to ensure gender participation, 3) to detect proper projects, including the design and implementation of strategies, 4) to find gender-sensitive indicators and budgets, 5) to allow both short run and long run perspectives, 6) to link programs to multilateral partners, 7) to identify possible outcomes justified with the developmental process (CIDA, 1999).

UNESCO-IESALO prescribed 1) to promote hiring and promotion policies and practices to capture female contribution better, 2) to provide women with increased opportunities for accessing leadership positions in higher education institutions via dedicated funding, training, mentoring and networking opportunities, 3) to collect longitudinal disaggregated gender data on staff performance and promotion to develop and implement systems which increase knowledge and transparency (Galan-Muros, 2023). UNICEF (n.d.) has prescribed a gender action plan for 2022-2025, creating five goal areas, e.g., (1) health care, HIV testing counselling, (2) gender-responsive education system, (3) addressing violence against girls, (4) equitable WASH system and (5) gender-responsive social protection system respectively.

India enacted equal access to women and girls in education. It created a gender-sensitive education system, implemented technical and vocational skills in women, initiated a special focus on backward communities and introduced a gender-sensitive curriculum at all levels of education. India recently took several programmes such as 1) GATI (Gender Advancement for Transforming Institutions), 2) BBBP (Beti Bachao Beti Padhao), 3) Mahila Shakti Kendra, 4) SSY (Sukanya Samridhi Yojana) and 5) Skill upgradation and Mahila Coir Yojana which are completely linked to combat gender inequality in education vis-à-vis SDGs-4 (iPleaders, 2022).

Finally, one should arguably note that in the postcolonial era, the demands between preparing targets, utilisation of education in increasing human capital development, international gender equality commitments and the various stages of cultural roles were very complex and completed in functioning education in achieving targets of global gender equality. Emphasis is needed to integrate national and international issues of gender inequality agendas to achieve sustainable development goals in empowering women in education system (Durrani & Halai, 2020).

## Concluding Remarks

There is no doubt that the following steps are theoretically and realistically applicable, which are as follows: 1) gender inequality in education deserves a fundamental explanation from the views of sociologists, 2) educational decision-making processes need more attention studying panel data analysis to clarify an input-output view of education on gender equality, 3) process and outcomes need to be linked to access in a general analysis of the present educational system, 4) the relationship between gender and institutional development needs further attention to the respective authorities, 5) more important researches on international comparisons are required and 6) sustainable development goal in education towards fulfilling gender equality is to be prepared successfully. The principal challenge of present research on gender inequality in education is to generate analytical documents on specific gender effects to develop a more theoretically motivated status of women in the educational system so that the challenges of implementation towards gender equality economically, historically, culturally and politically might be feasible in the offing (Jacobs, 1996). Above all, we have been living in a male-dominated higher educational organisation where gender equality initiative in higher education fails because of its features, structures and culture, which formally, directly or indirectly promote the progress of male career or hampers women's progression and acts as a metaphorical seven-headed dragon. It tries to devalue, isolate, marginalise and exclude women (O'Connor, 2020). However, we can expect the educational gender gap to end within 16 years from 2022, as predicted by the report of the World Economic Forum (2023).

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