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**Research Article**

# The Role of Education in Socio-Economic Development: A Gender Perspective in India

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**Abstract**: Education is a fundamental driver of socio-economic development and plays a pivotal role in reducing inequalities, fostering economic growth, and empowering marginalized communities, particularly women. This research examines the role of education in socio-economic development from a gender perspective in India, analyzing literacy rates, enrolment trends, dropout patterns, and workforce participation to assess gender disparities in education and their broader economic implications. The study employs secondary data analysis from government reports, national surveys, and global databases, focusing on key educational indicators such as Gross Enrolment Ratio (GER), Net Enrolment Rate (NER), and the Gender Parity Index (GPI). Findings reveal significant progress in female literacy, with rates increasing from 43.6% in 1981 to 77.7% in 2017, and substantial gains among rural women (12.2% increase from 2011-2017). However, gender gaps persist, particularly in STEM education, workforce integration, and higher education participation. Despite rising female enrolment at the higher secondary level (from 39.4% in 2012-13 to 58.2% in 2021-22), challenges such as early dropouts, socio-cultural constraints, and limited access to higher education continue to restrict women's educational mobility. The dropout rate at the secondary level has improved, declining from 21% in 2013-14 to 13% in 2021-22, yet structural barriers like safety concerns, inadequate school infrastructure, and economic constraints disproportionately impact female students. While more women are entering teaching professions (126 female teachers per 100 male teachers at the primary level in 2021-22), gender-stereotyped career choices remain prevalent, with women dominating education and healthcare while men dominate engineering and technology. Moreover, female labor force participation remains critically low (25.1% in 2021 compared to 79.1% for men), highlighting the gap between education and economic inclusion. The study concludes that education alone is not sufficient to ensure socio-economic empowerment for women. To bridge the gender gap in education and employment, policy interventions must focus on improving educational quality, expanding STEM participation, addressing socio-cultural barriers, and strengthening the link between education and workforce opportunities.

**Keywords:** Gender Disparity, Literacy Rates, Enrolment Trends, Dropout Rates, Workforce Participation, Socio-Economic Development, STEM Education, India.

## INTRODUCTION

### 1.1 Importance of Education in Human Development

Education serves as the cornerstone of human development, influencing individuals' socio-economic mobility, cognitive abilities, and overall well-being. It is widely acknowledged as a fundamental right, enshrined in global declarations such as the Universal Declaration of Human Rights [1]. The role of education extends beyond mere literacy; it equips individuals with critical thinking skills, enhances employment prospects, and fosters civic engagement, leading to the broader development of societies [2]

Education plays a transformative role in reducing inequalities and enabling marginalized populations to access better economic opportunities [3]. By imparting essential life skills, education empowers individuals to participate in social, political, and economic spheres, thereby fostering sustainable development [4]. The link between education and human development is evident in various indices, such as the Human Development Index (HDI), which incorporates literacy rates, life expectancy, and income as primary indicators of national progress [4]

The expansion of education across the globe has been a key driver of progress in health, employment, and social equity [6]. For instance, improved literacy rates have been linked to better health outcomes, as educated individuals are more likely to adopt preventive healthcare measures and make informed decisions regarding their well-being [7]. Moreover, higher education attainment is positively correlated with increased earning potential and job stability, demonstrating its significance in shaping economic trajectories [8]

Despite these advancements, disparities in access to education remain a pressing concern. Factors such as socio-economic status, geographic location, gender, and caste significantly influence educational attainment, particularly in developing countries [9]. In

India, while literacy rates have improved from 43.6% in 1981 to 77.7% in 2017 [10] significant gender-based disparities persist. These inequalities in education translate into economic disparities, limiting women's participation in the workforce and their ability to achieve financial independence.

### 1.2 Link Between Education and Socio-Economic Empowerment

Education is a powerful enabler of socio-economic empowerment, particularly for marginalized communities and women. It serves as a key determinant of income levels, occupational mobility, and overall economic stability [11]. Studies have consistently shown that higher levels of education correspond to improved employment opportunities, higher wages, and reduced poverty rates [12].

In the Indian context, access to education has been instrumental in shaping labor market dynamics. The introduction of the Right to Education (RTE) Act, 2009, which mandates free and compulsory education for children aged 6-14, has significantly increased enrolment rates [13]. However, the transition from primary to secondary and higher education remains a challenge, especially for girls, due to socio-cultural barriers, early marriages, and financial constraints [14].

Economic empowerment through education is particularly crucial for women, as it enhances their decision-making power, access to financial resources, and ability to challenge traditional gender norms [15]. Research suggests that educated women invest more in their children's health and education, thereby creating a positive intergenerational impact [16]. Furthermore, female literacy is closely linked to reduced fertility rates and improved maternal health outcomes [17].

The role of education in fostering entrepreneurship and self-employment is another critical aspect of socio-economic empowerment. In India, while women constitute nearly 50% of the population, their participation in entrepreneurship remains disproportionately low [18]. Access to education and skill development programs can bridge this gap by equipping women with the necessary knowledge and confidence to start their own businesses and contribute to economic growth [19].

Despite these positive correlations, significant challenges hinder the full realization of education's potential in driving socio-economic empowerment. Issues such as gender-based discrimination in the labor market, wage gaps, and occupational segregation limit the economic benefits that educated women can derive [20]. Additionally, structural barriers such as unpaid domestic work and lack of childcare facilities disproportionately affect women's ability to leverage their education for financial independence [21].

### 1.3 Gender Disparities in Education and Their Impact on Economic Participation

Gender disparities in education remain a critical issue worldwide, particularly in developing nations like India. Although significant progress has been made in closing the gender gap in primary education, disparities persist at higher levels of education and in STEM (Science, Technology, Engineering, and Mathematics) fields [22].

#### 1.3.1 Enrolment and Literacy Gaps

While the Gross Enrolment Ratio (GER) in India for primary education is nearly equal for boys and girls, the gap widens at the secondary and tertiary levels [13]. According to the All India Survey on Higher Education [23], female enrolment in STEM fields remains significantly lower than in humanities and social sciences. This disparity reflects broader societal norms that discourage women from pursuing careers in male-dominated fields [24].

Additionally, the literacy rate among women in rural areas lags behind that of men. While urban areas have witnessed a decline in the gender literacy gap (9.4 percentage points), rural areas continue to experience a substantial gap of 16.5 percentage points [10]. This inequality stems from factors such as early marriage, household responsibilities, and limited access to educational infrastructure.

#### 1.3.2 Economic Participation and Career Choices

Education is directly linked to labor force participation, yet gender disparities in employment persist despite improvements in female literacy and enrolment rates. India's female labor force participation rate (LFPR) remains among the lowest globally, at approximately 25.1% in 2021, compared to 79.1% for men [25]. This discrepancy underscores the complex interplay of education, societal expectations, and economic structures that limit women's access to formal employment.

The Gender Parity Index (GPI), which measures the ratio of female-to-male enrolment in education, has improved at the primary and higher education levels but shows fluctuating trends at the secondary level [26]. The GPI highlights the ongoing challenges in ensuring equal learning opportunities and career prospects for women.

Moreover, the types of careers pursued by men and women remain highly gendered. Women predominantly enter fields such as education, healthcare, and social work, while men dominate engineering, IT, and management sectors [23]. This occupational segregation contributes to wage gaps and limits women's economic independence [20]

#### 1.3.3 Structural Barriers and Research Gaps

While existing literature extensively discusses the importance of education in economic development, several research gaps remain unaddressed, limiting

the effectiveness of policy interventions and academic discourse on gender disparities. One of the critical gaps pertains to the **impact of education quality on economic outcomes**. Most studies primarily focus on enrolment rates and literacy levels but fail to examine how variations in the quality of education influence long-term economic benefits. A well-educated workforce requires not just access to education but also high-quality instruction, infrastructure, and curriculum alignment with industry needs, which remain largely underexplored in the Indian context. Another significant research gap is the **intersectionality in gender disparities**, where factors such as caste, religion, and regional disparities play a crucial role in shaping women's access to education and employment opportunities. While gender disparities are often analyzed in isolation, studies such as [27] highlight the need for a more nuanced approach that accounts for multiple layers of social inequality. Additionally, while government initiatives like the **Beti Bachao Beti Padhao** scheme have been introduced to enhance female education, the **effectiveness of government policies** in bridging the gap between education and workforce participation remains uncertain. There is limited empirical evidence on how such programs translate into actual career progression, wage equity, and job market integration for women. Moreover, a **persistent barrier to higher education in STEM fields** continues to restrict female representation in technology and engineering careers. Despite increasing female enrolment in higher education, participation in STEM disciplines remains disproportionately low, raising concerns about structural biases, societal expectations, and lack of mentorship opportunities. Addressing these gaps through targeted research will be essential in developing effective policies and fostering gender equity in education and employment.

Education is an essential driver of socio-economic empowerment, yet gender disparities continue to hinder its full potential. While literacy and enrolment rates have improved, women still face significant challenges in accessing quality education and translating their academic achievements into economic participation. Addressing these disparities requires a multifaceted approach, including policy interventions, cultural shifts, and targeted research on existing gaps. Future studies must examine the intersectional factors that influence educational outcomes and design strategies to create a more inclusive and equitable educational landscape.

## 2. LITERATURE REVIEW

The relationship between education and gender equality has been widely explored in academic discourse, with a focus on theoretical perspectives, the role of literacy in socio-economic empowerment, and research on enrolment trends, dropout rates, and gender gaps. This section synthesizes key literature to provide a comprehensive understanding of these dimensions, highlighting both progress made and persisting challenges.

### 2.1 Theoretical Perspectives on Education and Gender Equality

Theories on education and gender equality provide a foundation for understanding how education contributes to economic and social development while addressing historical disparities. Various theoretical frameworks have been developed to explain the role of education in shaping gender dynamics, including human capital theory, feminist theories, and capability approach.

#### 2.1.1 Human Capital Theory and Education

The **human capital theory**, initially developed and later expanded [28], emphasizes the economic benefits of investing in education. According to this perspective, education enhances individuals' productivity, employability, and earning potential, leading to overall economic growth. Empirical studies support this argument, showing that higher levels of education correlate with increased wages and improved job prospects, particularly for women [8]. In the Indian context, the rising female literacy rate and growing participation of women in formal education have been linked to improved labor market outcomes [20]. However, critics argue that human capital theory does not fully account for **gendered barriers** such as discrimination, unpaid domestic labor, and societal norms that hinder women's economic mobility despite educational attainment [29]

#### 2.1.2 Feminist Theories on Gender and Education

Feminist scholars argue that **education is both a site of empowerment and oppression**, depending on how it is structured and delivered [30]. The **liberal feminist perspective**, as advocated by scholars like [15], contends that equal access to education is essential for women's emancipation. This perspective supports policy interventions such as affirmative action, scholarship programs, and gender-sensitive curriculum reforms. On the other hand, **radical feminist theory** critiques the patriarchal structures embedded within educational institutions that reinforce traditional gender roles [31]. For example, biases in career counseling, curricular content, and teacher expectations often push women towards caregiving professions rather than STEM fields [24]. In India, despite policy efforts to promote girls' education, traditional gender norms continue to restrict women's choices in higher education and career pathways [9]

#### 2.1.3 Capability Approach and Women's Empowerment

[2] provides a broader understanding of education's role in gender equality by emphasizing the importance of freedom and agency in making life choices. Sen argues that education expands individuals' capabilities by providing them with the knowledge and skills necessary for economic participation, political engagement, and social empowerment. Similarly, [32]

emphasizes that education enhances women's ability to challenge oppressive social structures, negotiate for better economic opportunities, and improve their quality of life. Empirical studies in India support this view, demonstrating that educated women are more likely to participate in decision-making processes, have greater control over household income, and invest in their children's education [16]. However, structural barriers such as gender pay gaps, workplace discrimination, and inadequate childcare support limit the full realization of these capabilities, even among highly educated women [21].

### 2.2 Studies Highlighting the Role of Literacy in Economic and Social Empowerment

Literacy is widely recognized as a fundamental driver of economic self-sufficiency, social mobility, and political participation. Several studies highlight how improving literacy rates among women leads to broader socio-economic benefits.

#### 2.2.1 Economic Benefits of Female Literacy

Research consistently demonstrates that literacy improves employment prospects and income levels, particularly for women in developing economies [11]. A study [17] found that women with higher literacy levels have greater access to formal employment, financial independence, and entrepreneurship opportunities. In India, data from the [13] indicates that literacy rates among women rose from 43.6% in 1981 to 77.7% in 2017, with rural women experiencing the highest literacy gains. However, despite these improvements, female labor force participation remains low (25.1%) compared to men (79.1%), suggesting that literacy alone is insufficient to ensure economic empowerment [25]

#### 2.2.2 Social and Health Benefits of Literacy

Beyond economic gains, literacy contributes to better health outcomes, lower fertility rates, and improved child welfare. Studies show that educated women are more likely to adopt preventive healthcare practices, access maternal care, and make informed reproductive choices [7]. In India, female literacy has been linked to declining infant mortality rates and increased child vaccination coverage [33]. Moreover, literate women tend to invest more in their children's education, creating intergenerational improvements in human capital [16]. However, persistent gender biases in curriculum design and teaching methodologies limit the full potential of literacy programs, as they often reinforce traditional gender roles instead of promoting critical thinking and empowerment [24].

### 2.3 Previous Research on Enrolment Trends, Dropout Rates, and Gender Gaps

#### 2.3.1 Trends in Female Enrolment

Government initiatives such as the Right to Education (RTE) Act, 2009 and Beti Bachao Beti Padhao (BBBP) have contributed to rising female enrolment rates in India [13]. According to the All India Survey on Higher Education [23], the Gross Enrolment Ratio (GER) of female students at the primary level is 103.4%, but declines sharply at higher levels (58.2% at the senior secondary level and 27.9% in higher education). While female enrolment in humanities and social sciences surpasses that of males, participation in STEM fields remains disproportionately low, highlighting the influence of societal stereotypes and career expectations [24]

#### 2.3.2 Dropout Patterns and Contributing Factors

Despite increased enrolment, dropout rates among female students remain a significant challenge, particularly at the secondary level. The dropout rate for girls decreased from 21% in 2013-14 to 13% in 2021-22, yet barriers such as early marriage, domestic responsibilities, and lack of safe transportation continue to push girls out of school [10]. Research [14] found that household income, parental education, and infrastructural factors (such as the availability of separate toilets for girls in schools) significantly impact female retention rates.

#### 2.3.3 Gender Gaps in Educational Attainment and Labor Market Outcomes

While literacy and enrolment rates have improved, gender disparities in higher education persist. The Gender Parity Index (GPI), which measures female-to-male enrolment, has increased at primary and higher education levels but shows fluctuating trends at the secondary level [26]. Moreover, occupational segregation remains a significant issue, as women are disproportionately concentrated in education, healthcare, and social work, while men dominate STEM and business-related fields [23]. These disparities are further reflected in wage gaps and limited career progression for women [20]

The existing literature underscores the critical role of education in gender equality and socio-economic development, but several gaps remain in understanding the long-term economic benefits of education quality, intersectionality in gender disparities, and the effectiveness of government interventions. Addressing these issues through policy reforms, curriculum changes, and research on STEM participation is essential to achieving gender parity in education and the labor market.

## 3. METHODOLOGY

This study employs a **secondary data analysis** approach to examine gender disparities in education and their impact on socio-economic empowerment in India. The research relies on **government reports, statistical surveys, and publicly available educational databases** to provide an in-depth assessment of literacy rates, enrolment trends, and career outcomes for women. A **comparative analysis** of male and female educational attainment, participation rates, and labor market integration is conducted using key statistical indicators such as the **Gross Enrolment Ratio (GER), Net Enrolment Rate (NER), and Gender Parity Index (GPI).**

### 3.1 Research Design and Data Sources

This study is based on a **descriptive and comparative research design** that examines existing patterns and trends in education from a gendered perspective. The research utilizes **quantitative secondary data** collected from reputable national and international sources, including:

- **All India Survey on Higher Education (AISHE)** – Provides enrolment statistics at different levels of education, gender-based trends, and faculty composition in higher education.
- **National Sample Survey (NSS) Reports** – Offers insights into literacy rates, dropout patterns, and educational expenditures at the household level.
- **Educational Statistics at a Glance (Ministry of Education, Government of India)** – Presents longitudinal data on school participation, completion rates, and higher education attainment.
- **Unified District Information System for Education Plus (UDISE+)** – Provides school-level data on enrolment, dropout rates, and teacher-student ratios.
- **Annual Economic Survey of India** – Highlights the correlation between educational attainment and labor force participation.
- **World Bank & UNESCO Reports** – Offers a comparative global perspective on gender disparities in education.

These datasets enable a **longitudinal analysis** of gender-based educational trends in India, focusing on progress made over the past two decades.

### 3.2 Comparative Assessment of Gender-Based Differences

A **comparative approach** is used to analyze gender-based disparities in educational participation and economic outcomes. The analysis focuses on:

- **Literacy Rate Trends** – Examining male-female disparities in literacy rates across urban and rural areas.
- **Enrolment Patterns** – Assessing gender gaps in primary, secondary, and tertiary education.
- **Dropout Rates** – Identifying factors contributing to higher dropout rates among female students.
- **Career Choices and Workforce Participation** – Investigating the gendered distribution of employment across different industries and professional sectors.

The **comparative analysis** also considers regional variations in gender disparities, particularly between **rural and urban areas** and across **different Indian states.**

### 3.3 Key Educational Indicators Used

The study employs **three key educational indicators** to assess gender disparities:

#### 3.3.1 Gross Enrolment Ratio (GER)

The **Gross Enrolment Ratio (GER)** is a widely used indicator to measure **educational participation** at different levels. It is defined as:

$$GER = \frac{Total\ Enrolment\ in\ a\ Particular\ Level\ of\ Education}{Population\ of\ the\ Official\ Age\ Group\ For\ That\ Level} \times 100$$

A GER value greater than 100% suggests that students outside the official age group are enrolled, indicating late entries or grade repetitions. In India, GER trends reveal a decline in enrolment rates for females at higher levels of education, especially in STEM disciplines.

#### 3.3.2 Net Enrolment Rate (NER)

The **Net Enrolment Rate (NER)** is a more precise measure of **age-appropriate enrolment** in a given education level. It is defined as:

$$NER = \frac{Number\ of\ Children\ Enrolled\ in\ a\ Given\ Education\ Level\ (Within\ the\ Official\ Age\ Grou}{Total\ Population\ That\ Level} \times 100$$

NER helps identify gaps in early educational participation, particularly for girls, and highlights the effectiveness of policies like the Right to Education (RTE) Act in ensuring equitable school participation.

#### 3.3.3 Gender Parity Index (GPI)

The **Gender Parity Index (GPI)** is a crucial indicator that reflects **gender equality in education**. It is calculated as:

$$GPI = \frac{GER\ of\ Girls}{GER\ of\ Boys}$$

A GPI value of 1 indicates gender parity, while values less than 1 suggest male dominance, and values greater than 1 indicate female advantage. In India, GPI at the primary level has improved, but disparities remain at the secondary and higher education levels, especially in rural regions.

### 3.4 Data Analysis Techniques

The collected data is analyzed using descriptive statistics, trend analysis, and correlation analysis to identify:

- Longitudinal trends in gender-based literacy and enrolment.
- Regional disparities in female educational attainment.
- The correlation between education levels and workforce participation.

Graphs and charts are used to visualize patterns and disparities in gender-based educational statistics. Regression analysis is applied to assess the relationship between female educational attainment and labor force participation rates.

### 3.5 Ethical Considerations

Since this study relies on publicly available secondary data, no direct ethical concerns arise. However, ethical guidelines for data integrity, transparency, and unbiased reporting are followed. All data sources are appropriately cited, and efforts are made to ensure objective interpretation of gender disparities without reinforcing stereotypes.

## 4. Findings and Discussion

This section presents the key findings of the study based on secondary data analysis. It examines trends in literacy rates, enrolment across different education levels, dropout patterns, gender parity in education, and the role of teachers in shaping gender-based educational outcomes. The findings reveal that while significant progress has been made in improving female literacy and enrolment, gender disparities persist, particularly in higher education and workforce participation.

### 4.1 Literacy Rates and Gender Gaps

Literacy is a fundamental indicator of socio-economic progress and gender equality. In India, the overall literacy rate has improved significantly over the past few decades, increasing from 43.6% in 1981 to 77.7% in 2017 [10]. However, gender disparities continue to persist, particularly in rural areas.

The most notable improvement in literacy has been observed among rural women, who experienced a 12.2% increase between 2011 and 2017. This suggests that government initiatives such as Beti Bachao Beti Padhao and the Right to Education (RTE) Act, 2009 have played a role in enhancing female literacy. Despite progress, a significant gender gap remains. The literacy gap between men and women was 16.5 percentage points in rural areas and 9.4 percentage points in urban areas [10]. This disparity indicates that rural women continue to face greater barriers to accessing education, including socio-cultural restrictions, early marriage, and limited school infrastructure.

Kerala has the lowest gender disparity in literacy at 2.2%, which is attributed to high educational investments, female-friendly policies, and social awareness programs. On the other hand, states such as Rajasthan, Bihar, and Uttar Pradesh continue to exhibit high gender gaps in literacy, highlighting the need for region-specific interventions.

While literacy rates have improved, they have not translated proportionally into higher economic participation for women. Many literate women remain unemployed or are engaged in low-income, informal sector jobs, suggesting that mere literacy is not sufficient for economic empowerment without corresponding skill development and employment opportunities.

### 4.2 Enrolment Trends Across Different Levels

The Gross Enrolment Ratio (GER) is a critical measure of educational participation at different levels. India has made significant strides in ensuring that more children, especially girls, are enrolled in schools.

At the primary level (grades 1-5), GER was recorded at 103.4 in 2021-22, indicating that India has effectively achieved universal primary education [13]. The high GER suggests that both age-appropriate students and overage students (repeaters) are participating in primary education.

A positive trend in female enrolment is observed at the higher secondary level. The GER for females increased from 39.4% in 2012-13 to 58.2% in 2021-22. This growth reflects increasing awareness and policy interventions encouraging girls to complete secondary education. Women have higher enrolment than men in fields such as Arts, Science, Education, and Medical Sciences at the undergraduate level.

**Fig 1: Enrolment at undergraduate level in major disciplines/Subjects**

2020-21

| S.No. | Discipline | Male | Female |
|---|---|---|---|
| 1 | Arts | 49,88,246 | 54,17,424 |
| 2 | Science | 23,12,602 | 25,05,224 |
| 3 | Commerce | 22,27,036 | 20,96,418 |
| 4 | Engineering & Technology | 26,17,155 | 10,69,136 |
| 5 | Education | 6,08,888 | 10,40,305 |
| 6 | Medical Science | 6,32,069 | 8,94,178 |
| 7 | Social Science | 5,48,423 | 5,57,689 |
| 8 | IT & Computer | 5,33,445 | 3,44,492 |
| 9 | Management | 5,16,273 | 2,98,594 |
| 10 | Law | 3,16,115 | 1,61,897 |
| 11 | Others | 6,69,319 | 6,92,057 |
| | **Total** | **1,59,69,571** | **1,50,77,414** |

*Source:All India Survey on Higher Education Report , D/o of Higher Education, Ministry of Education*

This indicates that social perceptions continue to steer women towards traditional career paths associated with caregiving and education. However, gender gaps remain stark in STEM (Science, Technology, Engineering, and Mathematics) fields. Women continue to be underrepresented in Engineering, IT, Management, and Law—sectors that offer higher earning potential and better career opportunities. The low female participation in STEM fields is largely due to societal biases, lack of female role models, and gendered career counseling [24]. While overall enrolment levels have improved, transitioning from secondary to tertiary education remains a challenge for many girls, particularly in rural areas where financial constraints, safety concerns, and family obligations often force them to discontinue their studies.

### 4.3 Dropout Rates and Gender Differences

Dropout rates are a key indicator of education system efficiency and gender disparities. While primary school dropout rates have declined, dropout rates at secondary and higher education levels remain a major concern.

At the secondary level, dropout rates declined from 21% in 2013-14 to 13% in 2021-22 [10]. This improvement suggests that policy interventions such as scholarships, free textbooks, and mid-day meal programs have helped retain students. Female dropout

rates at the secondary level are lower than those of males, suggesting that more girls are staying in school longer. However, at the upper primary level (grades 6-8), female dropout rates are slightly higher than those of males. This trend reflects challenges such as menstrual hygiene issues, lack of separate toilets, and domestic responsibilities that often force girls to leave school earlier.

**Key barriers contributing to female dropouts include:**

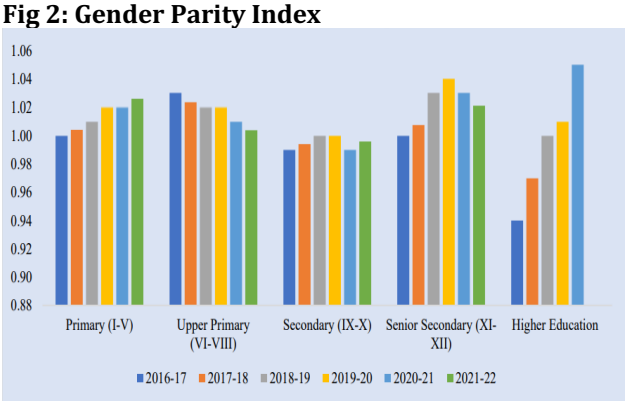
- Societal norms: Many families, especially in rural India, still prioritize marriage over education for girls.
- Safety concerns: Lack of safe transportation and fear of harassment deter many girls from attending school, particularly in states with high gender violence rates.
- Infrastructural challenges: Schools lacking separate toilets, proper sanitation facilities, and adequate classrooms discourage continued female participation.

While dropout rates have declined overall, targeted interventions are needed to ensure that more girls transition to higher education and vocational training rather than being pushed into early marriage or domestic labor.

### 4.4 Gender Parity Index (GPI) and Career Outcomes

The Gender Parity Index (GPI) is an essential measure of gender equality in education. While improvements have been made at primary and higher education levels, disparities persist at upper primary and senior secondary levels.

**Fig 2: Gender Parity Index**



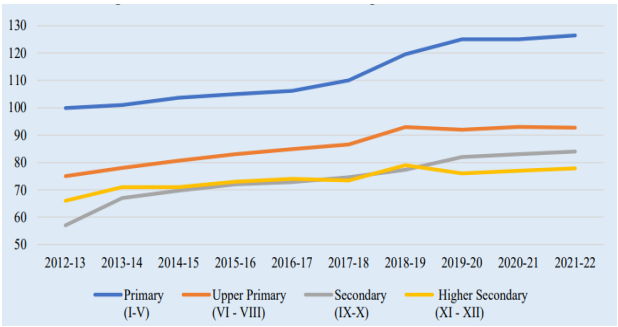

***Source: UDISE+, Ministry of Education***

GPI at the primary level has shown significant improvement, with near-equal participation of boys and girls. However, instability in GPI trends at the upper primary and secondary levels indicates that many girls struggle to continue education beyond primary school. Career choices continue to be highly gendered, with women dominating nursing, teaching, and social work, while men pursue careers in engineering, IT, and management. This reflects deeply ingrained gender norms that limit women's access to high-paying, high-growth professions [20]. Despite educational progress, female workforce participation remains low. In 2021, India's female labor force participation rate was only 25.1%, compared to 79.1% for men [25]. This suggests that education alone is not enough to ensure economic inclusion—policies addressing workplace discrimination, maternity leave, and flexible working conditions are equally necessary.

### 4.5 Role of Teachers in Gender-Based Education Trends

Teachers play a crucial role in shaping educational outcomes, particularly in influencing female participation and retention. Data shows that more women are entering the teaching profession, especially at primary levels.

**Fig 3: Number Of Female Teachers Per 100 Male Teachers**




***Source: Educational Statistics at Glance and UDISE+***

The number of female teachers per 100 male teachers at the primary level increased from 100 in 2012-13 to 126 in 2021-22 [13]. This suggests that teaching is becoming a preferred career choice for women due to its perceived stability and work-life balance. At tertiary education levels, female representation in faculty positions remains low (41%), reflecting gender biases in higher education institutions. Male dominance in STEM and management faculties discourages female students from pursuing these fields. Studies indicate that the presence of female teachers positively impacts female student enrolment and retention, as they provide role models, mentorship, and a safer learning environment [16]. Efforts to increase female participation in higher education faculty positions can enhance gender diversity in academia and encourage more women to pursue STEM careers.

### 5.1. Key Findings and Implications

The analysis reveals that India's literacy rate has improved from 43.6% in 1981 to 77.7% in 2017, with the highest gains observed among rural women. However, a persistent gender gap in literacy (16.5% in rural areas and 9.4% in urban areas) highlights the need for targeted policy interventions to ensure that women in marginalized communities have equal access to quality education. Kerala, with a gender disparity of only 2.2% in literacy, serves as a model state where high educational investment and social awareness programs have contributed to gender-balanced educational outcomes.

In terms of enrolment trends, female participation at

the higher secondary level increased from 39.4% in 2012-13 to 58.2% in 2021-22, indicating a positive shift in societal attitudes toward girls' education. However, gender gaps remain prominent in STEM fields, where women continue to be underrepresented in Engineering, IT, Management, and Law, reflecting deep-rooted gender biases and limited access to mentorship programs. While more women are enrolling in Arts, Science, and Medical Sciences, the occupational segregation in higher education translates into wage disparities and limited career advancement opportunities.

The study also identifies dropout rates as a key challenge, particularly at the upper primary and secondary education levels. Although the dropout rate at the secondary level has decreased from 21% in 2013-14 to 13% in 2021-22, major barriers persist, including safety concerns, lack of school infrastructure (such as separate toilets for girls), and socio-cultural norms that prioritize marriage and domestic responsibilities over continued education. Addressing these challenges requires a multi-pronged strategy, including financial incentives, awareness programs, and policy reforms to reduce school attrition rates among girls.

### 5.2. Challenges and Areas for Future Research

Despite advancements in gender parity at the primary and higher education levels, the study finds that the Gender Parity Index (GPI) remains unstable at the upper primary and senior secondary levels, suggesting fluctuations in female retention rates. Furthermore, even when women achieve educational milestones, they face challenges in career progression due to gender-stereotyped career choices, wage discrimination, and limited opportunities in leadership positions.

One of the significant gaps in existing research is the impact of education quality on long-term economic outcomes. While most studies focus on enrolment rates, little attention is given to how curriculum quality, digital literacy, and vocational training influence employability and income stability. Similarly, intersectionality in gender disparities, including the impact of caste, religion, and regional inequalities on women's educational outcomes, remains underexplored.

Additionally, while government initiatives such as the Beti Bachao Beti Padhao scheme and the Right to Education (RTE) Act have successfully improved access to education, their effectiveness in ensuring sustainable workforce integration and career progression for women remains unclear. Future research should focus on evaluating these policies through empirical studies and assessing their impact on closing the gender gap in employment and entrepreneurship.

### 5.3. Policy Recommendations

To bridge the gender gap in education and its socio-economic outcomes, comprehensive policy interventions must be implemented. The following strategies are recommended:

- Strengthen scholarship programs and financial incentives for women in higher education, especially in STEM fields.
- Improve school infrastructure, including safe transportation, separate toilets for girls, and digital learning resources to increase retention rates.
- Implement career counseling and mentorship programs to encourage women to pursue non-traditional career paths in STEM, IT, and management.
- Promote women in leadership positions through quota systems and affirmative action policies in higher education and corporate sectors.
- Address socio-cultural barriers by expanding awareness campaigns on the importance of female education.
- Develop flexible education models and vocational training programs that align with workforce demands, ensuring that education translates into employability.
- Conduct impact assessments of educational policies such as Beti Bachao Beti Padhao and Skill India to determine their effectiveness in bridging the education-to-employment gap for women.
- Strengthen collaboration between government agencies, private sector stakeholders, and educational institutions to create inclusive economic opportunities for educated women

## CONCLUSION

The study underscores that education is a powerful tool for socio-economic empowerment, but gender disparities in educational attainment and workforce participation continue to hinder India's progress toward gender equality. While improvements in literacy rates, enrolment, and policy support indicate positive change, structural barriers such as dropout rates, occupational segregation, and limited access to higher education in STEM fields prevent women from fully leveraging education for economic independence. Achieving gender parity in education requires a holistic approach that combines policy reforms, infrastructural improvements, skill development programs, and cultural shifts. By addressing regional and socio-economic disparities, promoting gender-sensitive policies, and ensuring that education translates into equitable economic opportunities, India can move toward a more inclusive and empowered society. Future research should focus on the intersectionality of gender and education, the quality of learning, and policy effectiveness to create a sustainable model for gender-inclusive education and economic development.

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