

## Gender Participation in Higher Education in India: Trends, Challenges and Policy Implications

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### Abstract

*This study looks into gender disparities in higher education enrolment and the composition of teaching staff in India using secondary data from AISHE reports. It focuses on trends in Gross Enrolment Ratio (GER), student enrolment by state, and gender parity among teaching staff. The results show a consistent rise in GER for both males and females from 2012 to 2021. Female GER increased from 20.1% to 28.5% and surpassed male GER from 2019 onward. Some states, like Ladakh, Andhra Pradesh, Lakshadweep, and Kerala, have more female students than male, while larger states like Tamil Nadu, Karnataka, West Bengal, and Uttar Pradesh show near gender parity. However, transgender enrolment remains very low in all states, indicating ongoing exclusion. Although Uttar Pradesh has the highest number of female teaching staff, the proportion is still low. Smaller states and union territories, such as the Andaman and Nicobar Islands, show higher female representation. The inferential analysis reveals no significant difference between male and female GER nationally and no regional variation in female faculty representation. The findings indicate progress toward gender equity but emphasize the need for focused, inclusive higher education policies.*

**Keywords:** Gender Participation, Higher Education, Policy Implications

### Introduction

Higher education in India is crucial for socio-economic development. It serves as a pathway to empowerment and equality. Over the years, changes have occurred with initiatives like the National Education Policy (NEP) 2020, which aims for a 50% Gross Enrolment Ratio (GER) by 2035. Gender participation has improved significantly, with women making up nearly half of total enrolments. However, gaps still exist across regions, fields of study, and socio-economic groups. This paper looks at trends in gender involvement, especially regarding enrolment patterns, completion rates, and integration into the academic workforce. By examining key data, it seeks to identify challenges and suggest policy measures to improve inclusivity. Despite the advancements, systemic barriers such as patriarchal norms, financial issues, and safety concerns hinder women's full participation. The divide between rural and urban areas deepens inequalities, with lower GER among females in underdeveloped states. Additionally, gender biases in subject selection limit opportunities in STEM fields. This study places these issues within India's diverse demographic context, emphasizing the need for gender-sensitive strategies to harness women's contributions to national growth. Recent data from the All India Survey on Higher Education (AISHE) 2021-22 shows significant progress in gender participation. Total student enrolment reached 4.33 crore, with females accounting for 2.07 crore, or about 47.8%. The Gross Enrolment Ratio (GER) for the 18-23 age group is 28.4 overall, with female GER at 28.5, slightly higher than the male GER of 28.3. This has led to a Gender Parity Index (GPI) of 1.01 for the fifth year in a row. Female enrolment has increased by 32% since 2014-15, rising from 1.57 crore, while the overall increase is 26.5%. This growth is particularly remarkable among marginalized groups, such as Scheduled Tribe (ST) females, whose GER climbed to 20.9 from 12.2, and Scheduled Caste (SC) females, who saw a 51% increase in enrolment.



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Despite these achievements, gender imbalances remain in faculty representation, where women make up just 43.4% of teachers, totalling 6.94 lakh out of 15.98 lakh. Additionally, disparities persist in certain disciplines and regions. This highlights the need for ongoing examination of trends, completion rates, and institutional roles to ensure fair outcomes.

## Review of Literature

The literature on gender participation in higher education in India highlights ongoing inequalities, even with policy improvements. Ghosh and Kundu (2021) analysed women's enrolment across major states using AISHE data. They found that socio-economic factors like household income and parental education play a significant role in participation rates. Northern states have lower gross enrolment ratios (GER) compared to southern states. Gautam (2015) looked into subject choices. She found that cultural stereotypes guide women toward humanities and social sciences. This limits their access to high-paying careers in STEM, according to surveys from multiple universities. Chari Wagh and Rayaprol (2023) studied how gender and marginality intersect, arguing that caste and class create additional obstacles for women from disadvantaged backgrounds. Their conclusions come from qualitative interviews at educational institutions. John (2012) critiqued reforms since liberalization. He observed that privatization has increased gender gaps by raising costs, which has a major impact on rural women. This is evident in enrolment trends from 1990 to 2010. Gupta (2023) focused on women in STEM, using a social constructionist approach. She emphasized institutional biases and the lack of mentorship as major challenges, based on case studies from Indian institutes of technology. Gandhi and Sen (2021) examined leadership roles. They found that only 10-15% of university heads are women due to the glass ceiling effect, supported by data from UGC reports. Verma (2014) discussed the impact of globalization. While opportunities have increased, social inequalities remain. Women from low-income families experience lower completion rates. Shukla and Mishra (2024) evaluated progress toward higher education goals. Their descriptive analysis shows gradual improvements in female GER, but stagnation in faculty representation persists.

Das, K., and Halder, S. (2021) examine gender parity trends in STEM fields using AISHE data. The findings show persistent male dominance even as female enrolment grows. They call for targeted actions to improve access and retention in technical areas. Ghosh, S., and Kundu, A. (2021) analyse women's enrolment in major states using GER and GPI metrics from AISHE reports. They identify regional disparities related to socio-economic factors and advocate for state-specific policies. Chanana, K. (2020) explores barriers to women's representation in leadership and governance roles. Using empirical data, the work shows the effects of the glass ceiling and suggests strategies for inclusion. Singh, R. Mukherjee, and Kumar, A. (2025) use longitudinal data to study gender differences in higher education completion rates. They reveal that women face higher dropout risks due to socio-cultural and economic factors. Khanna G. (2024) discuss the intersectional challenges faced by women academics, including biases related to caste, class, and region. They provide qualitative insights from institutions in Delhi. Saravanan S. & Semmalai S. (2023) analyse the significance of women's participation by looking at trends in enrolment and faculty roles. They emphasize NEP 2020's role in addressing barriers to empowerment. Ankur Nandi et al. (2025) focus on faculty positions and provide an overview of gender gaps among teaching and non-teaching staff over the past decade. They identify causes like bias in promotions and recommend supportive policies. Bocharé R. (2025) review a decade of enrolment data from 2011 to 2022. Their findings show that female enrolment has recently surpassed male enrolment, but there are still imbalances in discipline choices and completion rates.

## Need for the Study

Despite many studies on higher education in India, there is a lack of thorough evaluations that combine several indicators such as GER, enrolments, outcomes, and staff composition with a focus on gender. Current research often looks at isolated aspects, missing broader trends and connections to policy. This study fills that gap by analysing secondary data to offer updated insights into changing dynamics, especially after NEP 2020, to guide targeted interventions.

## Significance of the Study

This research is important for policymakers, educators, and stakeholders because it shows ways to improve women's roles in higher education. It supports the goal of achieving gender equality, promoting economic empowerment, and closing gender gaps in the workforce. By pointing out challenges and implications, it helps create inclusive policies that increase diversity in institutions and develop national human capital.

## Objectives of the Study

1. To examine trends in gender participation in higher education in India.
2. To identify main challenges that affect women's participation and suggest policy ideas for fair access and better use of women's potential in academia and beyond.

The study focuses on the Gross Enrolment Ratio (GER), student enrolments, graduation rates, teaching staff, and non-teaching staff using secondary data.

## Research Methodology

The study uses a descriptive and analytical research design to explore gender differences in higher education enrolment and teaching staff in India. It relies entirely on secondary data from the All India Survey on Higher Education (AISHE)

reports for the relevant years. Three datasets are examined: (i) Gross Enrolment Ratio (GER) by gender over time, (ii) student enrolment by state and gender, and (iii) the gender composition of teaching staff by state.

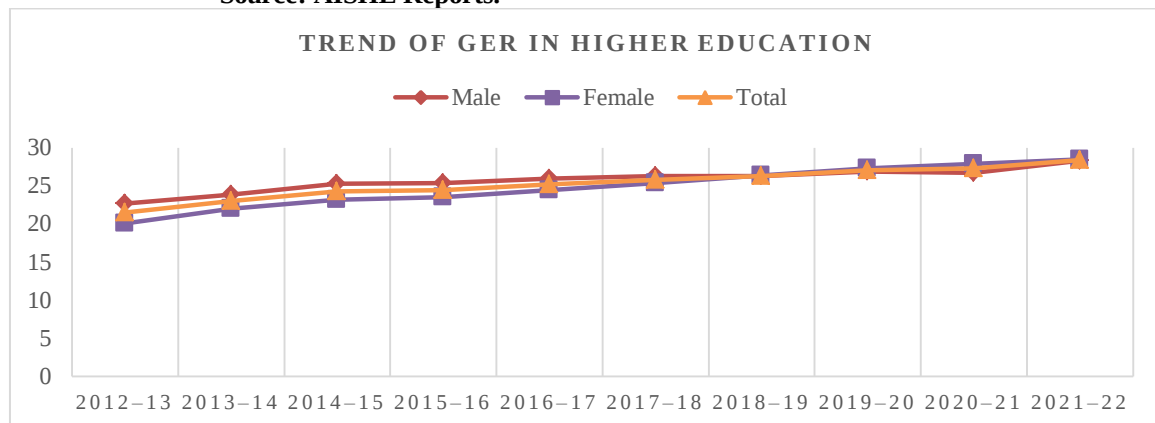
Descriptive statistics such as percentages, ratios, and ranks are utilized along with inferential statistical tools. A paired t-test analyses the differences between male and female GER over time, while a one-sample Z (t) test checks whether female enrolment proportions significantly exceed those of males in selected states. The Gender Parity Index (GPI) assesses gender balance among teaching staff. In addition, One-Way ANOVA uses female percentage as the dependent variable to test regional differences (North, South, East, and West). The analysis is performed using SPSS, and results are interpreted at a 5% significance level.

## Data Analysis:

**Table 1 Exhibits the Trend of GER in Higher Education.**

| Year    | Male | Female | Total |
|---------|------|--------|-------|
| 2012–13 | 22.7 | 20.1   | 21.5  |
| 2013–14 | 23.9 | 22     | 23    |
| 2014–15 | 25.3 | 23.2   | 24.3  |
| 2015–16 | 25.4 | 23.5   | 24.5  |
| 2016–17 | 26   | 24.5   | 25.2  |
| 2017–18 | 26.3 | 25.4   | 25.8  |
| 2018–19 | 26.3 | 26.4   | 26.3  |
| 2019–20 | 26.9 | 27.3   | 27.1  |
| 2020–21 | 26.7 | 27.9   | 27.3  |
| 2021–22 | 28.3 | 28.5   | 28.4  |

Source: AISHE Reports.



The Gross Enrolment Ratio (GER) in higher education shows a steady upward trend for both males and females during the study period. Notably, women's GER increased consistently from 20.1% in 2012 to 28.5% in 2021, reflecting significant improvement in female participation in higher education. From 2018 onward, the female GER not only matched but slightly surpassed the male GER. This indicates a narrowing and reversal of the gender gap. This progress highlights the positive impact of policy initiatives, increased awareness, and better access to higher education for women. Overall, the rising women's GER shows a shift towards greater gender equity in higher education enrolment in India.

**H<sub>0,1</sub>: There is no significant difference between Male GER and Female GER.**

## Paired Samples Statistics

|                 | Mean    | N  | Std. Deviation | Std. Error Mean |
|-----------------|---------|----|----------------|-----------------|
| Pair 1 Male GER | 25.7800 | 10 | 1.57889        | .49929          |
| Female GER      | 24.8800 | 10 | 2.72185        | .86072          |

## Paired Samples Test

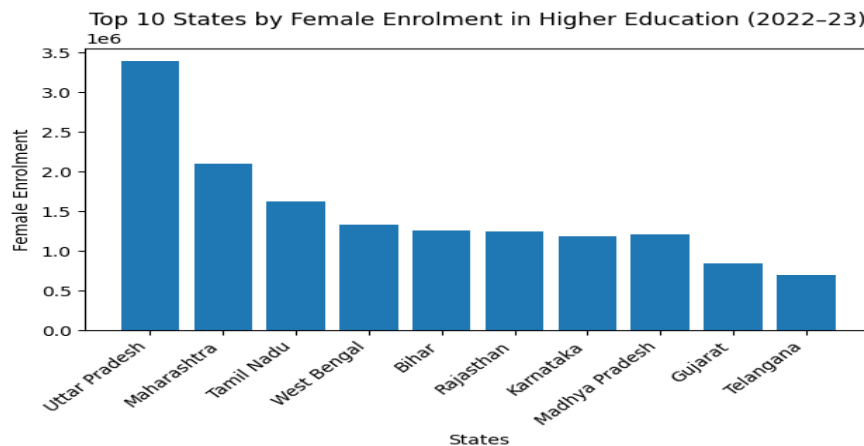
|        |                       | Paired Differences |                |                 |                                           |         | t     | df | Sig. (2-tailed) |
|--------|-----------------------|--------------------|----------------|-----------------|-------------------------------------------|---------|-------|----|-----------------|
|        |                       | Mean               | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference |         |       |    |                 |
|        |                       |                    |                |                 | Lower                                     | Upper   |       |    |                 |
| Pair 1 | Male GER - Female GER | .90000             | 1.29099        | .40825          | -.02352                                   | 1.82352 | 2.205 | 9  | .055            |

The paired t-test results show that the mean Male GER is 25.78, which is slightly higher than the mean Female GER at 24.88. This gives an average difference of 0.90. However, the significance value is  $p = 0.055$ , which is above the usual 5% level. As a result, the difference between Male GER and Female GER is not statistically significant. Therefore, we accept the null hypothesis, which states that there is no significant difference between Male GER and Female GER. This indicates nearly equal gender representation in higher education enrolment over the period.

**Table 2 Exhibits State-wise and Gender-wise Student Enrolment with Rank (2022-23)**

| State                                | Male      | Male % | Female    | Female % | Transgender | Transgender % | Grand Total | Female Rank |
|--------------------------------------|-----------|--------|-----------|----------|-------------|---------------|-------------|-------------|
| Uttar Pradesh                        | 35,33,862 | 50.98  | 33,86,933 | 48.86    | 11,433      | 0.16          | 69,32,228   | 1           |
| Maharashtra                          | 25,21,559 | 54.56  | 20,96,455 | 45.36    | 3,556       | 0.08          | 46,21,570   | 2           |
| Tamil Nadu                           | 17,03,761 | 51.26  | 16,19,621 | 48.73    | 178         | 0.01          | 33,23,560   | 3           |
| West Bengal                          | 13,57,968 | 50.52  | 13,29,985 | 49.48    | 206         | 0.01          | 26,88,159   | 4           |
| Bihar                                | 13,48,556 | 51.7   | 12,62,075 | 48.38    | 8           | 0             | 26,08,639   | 5           |
| Rajasthan                            | 13,24,534 | 51.52  | 12,44,664 | 48.42    | 1,592       | 0.06          | 25,70,790   | 6           |
| Madhya Pradesh                       | 13,50,845 | 52.83  | 12,04,391 | 47.11    | 1,510       | 0.06          | 25,56,746   | 7           |
| Karnataka                            | 12,46,057 | 51.18  | 11,87,571 | 48.78    | 1,009       | 0.04          | 24,34,637   | 8           |
| Gujarat                              | 10,38,746 | 55.18  | 8,41,182  | 44.69    | 2,506       | 0.13          | 18,82,434   | 9           |
| Telangana                            | 6,89,186  | 49.59  | 7,00,298  | 50.39    | 154         | 0.01          | 13,89,638   | 10          |
| Kerala                               | 4,86,113  | 41.77  | 6,77,624  | 58.22    | 95          | 0.01          | 11,63,832   | 11          |
| Delhi                                | 6,52,593  | 51.13  | 6,23,820  | 48.87    | 15          | 0             | 12,76,428   | 12          |
| Haryana                              | 5,53,134  | 48.42  | 5,89,089  | 51.57    | 59          | 0.01          | 11,42,282   | 13          |
| Odisha                               | 5,81,988  | 53     | 5,15,971  | 46.99    | 82          | 0.01          | 10,98,041   | 14          |
| Chhattisgarh                         | 4,18,692  | 45.82  | 4,95,057  | 54.18    | 44          | 0             | 9,13,793    | 15          |
| Jharkhand                            | 4,49,647  | 49.99  | 4,49,709  | 49.99    | 175         | 0.02          | 8,99,531    | 16          |
| Punjab                               | 4,63,382  | 50.91  | 4,46,807  | 49.09    | 37          | 0             | 9,10,226    | 17          |
| Andhra Pradesh                       | 2,38,533  | 39.62  | 3,63,034  | 60.3     | 510         | 0.08          | 6,02,077    | 18          |
| Assam                                | 3,60,532  | 51.51  | 3,39,320  | 48.48    | 15          | 0             | 6,99,867    | 19          |
| Uttarakhand                          | 2,58,514  | 50.56  | 2,52,788  | 49.44    | 17          | 0             | 5,11,319    | 20          |
| Jammu & Kashmir                      | 1,89,530  | 48.01  | 2,05,266  | 51.99    | 3           | 0             | 3,94,799    | 21          |
| Himachal Pradesh                     | 1,47,172  | 46.62  | 1,68,498  | 53.37    | 20          | 0.01          | 3,15,690    | 22          |
| Manipur                              | 58,217    | 50.04  | 58,099    | 49.94    | 22          | 0.02          | 1,16,338    | 23          |
| Meghalaya                            | 44,141    | 44.25  | 55,604    | 55.74    | 11          | 0.01          | 99,756      | 24          |
| Chandigarh                           | 54,067    | 50.02  | 54,024    | 49.98    | 4           | 0             | 1,08,095    | 25          |
| Tripura                              | 52,167    | 50.98  | 50,156    | 49.02    | 1           | 0             | 1,02,324    | 26          |
| Puducherry                           | 40,502    | 46.84  | 45,945    | 53.14    | 14          | 0.02          | 86,461      | 27          |
| Goa                                  | 34,619    | 52.43  | 31,404    | 47.56    | 2           | 0             | 66,025      | 28          |
| Arunachal Pradesh                    | 33,584    | 53.09  | 29,673    | 46.91    | 0           | 0             | 63,257      | 29          |
| Nagaland                             | 22,765    | 44.62  | 28,251    | 55.37    | 2           | 0             | 51,018      | 30          |
| Mizoram                              | 24,170    | 49.77  | 24,394    | 50.23    | 0           | 0             | 48,564      | 31          |
| Sikkim                               | 14,556    | 48.43  | 15,497    | 51.57    | 0           | 0             | 30,053      | 32          |
| Dadra & Nagar Haveli and Daman & Diu | 6,554     | 51.47  | 6,179     | 48.53    | 0           | 0             | 12,733      | 33          |
| Ladakh                               | 1,639     | 36.23  | 2,885     | 63.77    | 0           | 0             | 4,524       | 34          |
| Andaman & Nicobar Islands            | 2,654     | 50.09  | 2,644     | 49.91    | 0           | 0             | 5,298       | 35          |
| Lakshadweep                          | 192       | 37.43  | 321       | 62.57    | 0           | 0             | 513         | 36          |

Source: AISHE Portal, 2022-23 (Provisional)



The results show a clear trend of higher female enrolment in higher education across various Indian states and Union Territories. In Kerala, women make up 58.22% of total enrolment, which is much higher than men. Andhra Pradesh also shows a strong female presence, with females representing 60.30% of enrolment, indicating ongoing progress in women's access to higher education. Ladakh has a notably high female enrolment rate of 63.77%, demonstrating a significant advantage for women. Lakshadweep also shows a strong female presence, with women comprising 62.57% of total students. Meghalaya has a higher female share of 55.74%, reflecting positive gender participation trends in the North-Eastern region. Nagaland also displays female dominance, with women accounting for 55.37% of enrolment. In Chhattisgarh, women make up 54.18%, surpassing male participation. Himachal Pradesh records 53.37% female enrolment, showing balanced yet favourable trends for women. Additionally, Haryana (51.57%) and Telangana (50.39%) display slight but important female dominance, highlighting the gradual shift towards gender equity in higher education across India.

**$H_{0,2}$ : Female enrolment proportion  $\leq$  Male enrolment proportion.**

To test whether female enrolment proportion is  $\leq$  male enrolment proportion, one sample Z test has been applied.

## One-Sample Statistics

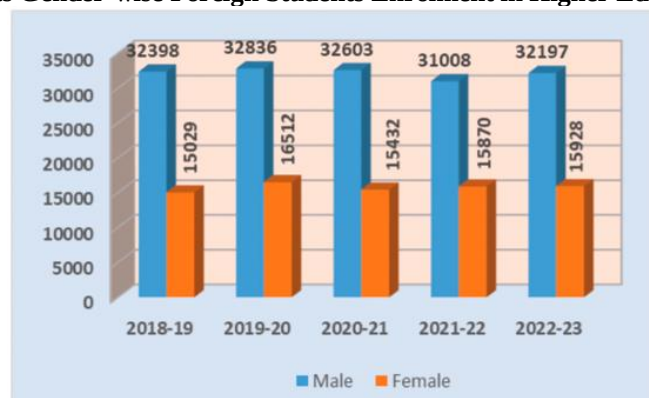
|           | N  | Mean  | Std. Deviation | Std. Error Mean |
|-----------|----|-------|----------------|-----------------|
| Diff_Prop | 15 | .0967 | .08971         | .02316          |

## One-Sample Test

|           | Test Value = 0 |    |                 |                 |                                           |       |
|-----------|----------------|----|-----------------|-----------------|-------------------------------------------|-------|
|           | z              | df | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference |       |
|           |                |    |                 |                 | Lower                                     | Upper |
| Diff_Prop | 4.173          | 14 | .001            | .09667          | .0470                                     | .1464 |

The one-sample Z test results show that the mean difference in enrolment proportion (Female – Male) is positive (0.0967), indicating higher female enrolment than male enrolment in the selected states. The test statistic is significant ( $z = 4.173$ ) with a p-value of 0.001, which is well below the 5% level of significance. Therefore, the null hypothesis ( $H_{0,2}$ ) stating that female enrolment proportion is less than or equal to male enrolment proportion is rejected. This confirms that female enrolment proportion is significantly higher than male enrolment proportion in the analysed states.

**Figure exhibits Gender-wise Foreign Students Enrolment in Higher Education in India.**



The figure shows that male foreign students consistently outnumber female foreign students in higher education in India from 2018 to 2023. While male enrolment fluctuates slightly, female enrolment rises gradually and steadily over the years. Overall, the trend indicates a growing number of female foreign students, although a clear gender gap in favour of males remains.

**Table 3 Exhibits State & Gender-wise Teaching Staff in HEIs with Percentage Share and Female Rank**

| State / UT                           | Male     | Female   | Transgender | Grand Total | Male % | Female % | Transgender % | Female Rank | GPI  |
|--------------------------------------|----------|----------|-------------|-------------|--------|----------|---------------|-------------|------|
| Tamil Nadu                           | 1,01,577 | 1,08,197 | 29          | 2,09,803    | 48.42  | 51.56    | 0.01          | 1           | 1.07 |
| Maharashtra                          | 97,049   | 77,473   | 31          | 1,74,553    | 55.61  | 44.39    | 0.02          | 2           | 0.80 |
| Karnataka                            | 72,264   | 69,325   | 27          | 1,41,616    | 51.03  | 48.95    | 0.02          | 3           | 0.96 |
| Uttar Pradesh                        | 1,25,953 | 59,310   | 20          | 1,85,283    | 67.97  | 32.01    | 0.01          | 4           | 0.47 |
| Andhra Pradesh                       | 62,983   | 41,596   | 10          | 1,04,589    | 60.22  | 39.77    | 0.01          | 5           | 0.66 |
| Kerala                               | 22,937   | 40,380   | 14          | 63,331      | 36.22  | 63.75    | 0.02          | 6           | 1.76 |
| Madhya Pradesh                       | 47,344   | 35,791   | 16          | 83,151      | 56.94  | 43.03    | 0.02          | 7           | 0.76 |
| Telangana                            | 40,789   | 33,365   | 10          | 74,164      | 54.98  | 44.98    | 0.01          | 8           | 0.82 |
| Punjab                               | 19,637   | 31,151   | 11          | 50,799      | 38.66  | 61.32    | 0.02          | 9           | 1.59 |
| Rajasthan                            | 53,594   | 30,585   | 6           | 84,185      | 63.67  | 36.32    | 0.01          | 10          | 0.57 |
| Gujarat                              | 36,917   | 29,298   | 12          | 66,227      | 55.76  | 44.23    | 0.02          | 11          | 0.79 |
| West Bengal                          | 47,551   | 28,029   | 4           | 75,584      | 62.92  | 37.07    | 0.01          | 12          | 0.59 |
| Haryana                              | 19,701   | 23,187   | 9           | 42,897      | 45.94  | 54.05    | 0.02          | 13          | 1.18 |
| Odisha                               | 27,043   | 18,170   | 10          | 45,223      | 59.8   | 40.18    | 0.02          | 14          | 0.67 |
| Chhattisgarh                         | 12,137   | 12,086   | –           | 24,223      | 50.1   | 49.9     | –             | 15          | 1.00 |
| Assam                                | 14,761   | 11,957   | 3           | 26,721      | 55.25  | 44.72    | 0.01          | 16          | 0.81 |
| Delhi                                | 9,501    | 11,624   | 5           | 21,130      | 44.97  | 55       | 0.02          | 17          | 1.22 |
| Bihar                                | 30,180   | 10,421   | 5           | 40,606      | 74.34  | 25.66    | 0.01          | 18          | 0.35 |
| Uttarakhand                          | 10,612   | 7,374    | 5           | 17,991      | 58.99  | 40.99    | 0.03          | 19          | 0.69 |
| Jharkhand                            | 10,728   | 6,163    | 2           | 16,893      | 63.5   | 36.48    | 0.01          | 20          | 0.57 |
| Himachal Pradesh                     | 5,159    | 5,196    | –           | 10,355      | 49.82  | 50.18    | –             | 21          | 1.01 |
| Jammu & Kashmir                      | 6,600    | 4,757    | 1           | 11,358      | 58.1   | 41.89    | 0.01          | 22          | 0.72 |
| Manipur                              | 3,268    | 3,282    | –           | 6,550       | 49.89  | 50.11    | –             | 23          | 1.00 |
| Puducherry                           | 3,466    | 3,123    | –           | 6,589       | 52.62  | 47.38    | –             | 24          | 0.90 |
| Meghalaya                            | 1,655    | 2,296    | –           | 3,951       | 41.89  | 58.11    | –             | 25          | 1.39 |
| Goa                                  | 1,775    | 2,243    | 1           | 4,019       | 44.16  | 55.8     | 0.02          | 26          | 1.26 |
| Chandigarh                           | 1,555    | 2,162    | 1           | 3,718       | 41.83  | 58.14    | 0.03          | 27          | 1.39 |
| Nagaland                             | 1,113    | 1,570    | –           | 2,683       | 41.49  | 58.51    | –             | 28          | 1.41 |
| Arunachal Pradesh                    | 1,250    | 1,051    | 1           | 2,302       | 54.31  | 45.66    | 0.04          | 29          | 0.84 |
| Tripura                              | 1,772    | 1,047    | –           | 2,819       | 62.86  | 37.14    | –             | 30          | 0.59 |
| Mizoram                              | 993      | 1,023    | –           | 2,016       | 49.26  | 50.74    | –             | 31          | 1.03 |
| Sikkim                               | 822      | 672      | –           | 1,494       | 55.02  | 44.98    | –             | 32          | 0.82 |
| Dadra & Nagar Haveli and Daman & Diu | 315      | 259      | –           | 574         | 54.88  | 45.12    | –             | 33          | 0.82 |
| Ladakh                               | 201      | 106      | –           | 307         | 65.47  | 34.53    | –             | 34          | 0.53 |
| Andaman & Nicobar Islands            | 24       | 52       | –           | 76          | 31.58  | 68.42    | –             | 35          | 2.17 |
| Lakshadweep                          | 34       | 25       | –           | 59          | 57.63  | 42.37    | –             | 36          | 0.74 |

Source: AISHE Portal, 2022-23 (Provisional)

The table shows that Tamil Nadu has the highest number of female teaching staff in higher education institutions. This reflects the size of its higher education system, even though the proportion of women is relatively low. In contrast, the Andaman and Nicobar Islands have the highest percentage of female staff at 68.42%. This indicates strong gender

representation among a smaller faculty base. States like Kerala (63.75%), Punjab (61.32%), Tamil Nadu (51.56%), Delhi (55%), and Haryana (54.05%) also have a majority of female teaching staff, showcasing progress in gender inclusion in academic jobs. Southern states, especially Tamil Nadu (51.56%) and Karnataka (48.95%), have a nearly balanced gender composition with significant numbers of women faculty. Larger northern states such as Bihar, Uttar Pradesh, and Rajasthan show lower female shares, highlighting ongoing gender gaps in faculty recruitment. The transgender category remains very small across all states, indicating a need for inclusive hiring policies. Overall, the table shows a gradual shift toward gender balance in higher education teaching staff, although regional differences are still significant. These patterns emphasize the need for state-specific actions to improve women's participation in academic professions across India.

The Gender Parity Index (GPI) values show significant differences in gender balance among teaching staff in higher education institutions across states. The Andaman & Nicobar Islands (GPI = 2.17), Kerala (1.76), Punjab (1.59), and Nagaland (1.41) demonstrate a strong female presence, indicating good gender parity in academic jobs. On the other hand, larger states like Bihar (0.35), Uttar Pradesh (0.47), and Rajasthan (0.57) have low GPI values. This highlights the ongoing male dominance and the need for specific policies to boost women's representation in higher education teaching roles.

## Region-wise distribution of States

|                                                                                                                                                                                       |                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>North Region – 1</b><br>Jammu & Kashmir<br>Himachal Pradesh, Punjab, Haryana<br>Uttarakhand, Uttar Pradesh, Chandigarh<br>Delhi, Ladakh                                            | <b>South Region – 2</b><br>Tamil Nadu, Karnataka, Kerala,<br>Andhra Pradesh, Telangana, Puducherry                                                       |
| <b>East Region – 3</b><br>Bihar, Jharkhand, Odisha, West Bengal,<br>Assam, Arunachal Pradesh, Manipur,<br>Meghalaya, Mizoram, Nagaland, Tripura, Sikkim,<br>Andaman & Nicobar Islands | <b>West Region – 4</b><br>Maharashtra, Gujarat,<br>Rajasthan, Goa, Madhya Pradesh, Chhattisgarh,<br>Dadra & Nagar Haveli and Daman & Diu,<br>Lakshadweep |

$H_{0,3}$ : There is no significant difference in the mean percentage of female teaching staff across different regions of India.

## Tests of Normality

| Region of the State          |       | Kolmogorov-Smirnova |    |       | Shapiro-Wilk |    |      |
|------------------------------|-------|---------------------|----|-------|--------------|----|------|
|                              |       | Statistic           | df | Sig.  | Statistic    | df | Sig. |
| Percentage of Teaching staff | North | .175                | 9  | .200* | .932         | 9  | .502 |
|                              | South | .228                | 6  | .200* | .926         | 6  | .549 |
|                              | East  | .127                | 13 | .200* | .974         | 13 | .932 |
|                              | West  | .252                | 8  | .145  | .929         | 8  | .510 |

\*. This is a lower bound of the true significance.

## a. Lilliefors Significance Correction

The Shapiro-Wilk test results show that the p-values for all four regions (North, South, East, and West) are greater than 0.05. This indicates that the distribution of the percentage of female teaching staff does not significantly differ from normality in any region. As a result, the assumption of normality needed for applying One-Way ANOVA is met.

## Descriptive

### Percentage of Teaching staff

|       | N  | Mean    | Std. Deviation | Std. Error | 95% Confidence Interval for Mean |             | Minimum | Maximum |
|-------|----|---------|----------------|------------|----------------------------------|-------------|---------|---------|
|       |    |         |                |            | Lower Bound                      | Upper Bound |         |         |
| North | 9  | 47.5678 | 10.56237       | 3.52079    | 39.4488                          | 55.6867     | 32.01   | 61.32   |
| South | 6  | 49.3983 | 8.08881        | 3.30224    | 40.9096                          | 57.8870     | 39.77   | 63.75   |
| East  | 13 | 45.9831 | 11.34468       | 3.14645    | 39.1276                          | 52.8386     | 25.66   | 68.42   |
| West  | 8  | 45.1450 | 5.70215        | 2.01601    | 40.3779                          | 49.9121     | 36.32   | 55.80   |
| Total | 36 | 46.7622 | 9.36258        | 1.56043    | 43.5944                          | 49.9301     | 25.66   | 68.42   |

## ANOVA

|                | Sum of Squares | df | Mean Square | F    | Sig. |
|----------------|----------------|----|-------------|------|------|
| Between Groups | 76.350         | 3  | 25.450      | .272 | .845 |
| Within Groups  | 2991.676       | 32 | 93.490      |      |      |
| Total          | 3068.026       | 35 |             |      |      |

The One-Way ANOVA results show that there is no significant difference in the average percentage of female teaching staff among the four regions of India. The F-value is 0.272, which is not significant at the 5% level ( $p = 0.845$ ). Since

the p-value is much higher than 0.05, we accept the null hypothesis ( $H_0$ ). This means that the representation of female teaching staff does not change much from region to region, and the location does not significantly affect the percentage of female teaching staff in higher education institutions.

## Key Findings of the Study

1. The Gross Enrolment Ratio (GER) in higher education has shown a steady increase for both males and females from 2012 to 2021. Female GER rose from 20.1% to 28.5%. This change narrowed the gender gap and led to female GER surpassing male GER starting in 2019. This indicates better access and participation of women in higher education.
2. The overall GER increased significantly from 21.5% in 2012 to 28.4% in 2021. This growth reflects expanded capacity, support from policies, and rising demand for higher education across the country, with gender disparities gradually decreasing.
3. Female enrolment dominates in several states. Ladakh (63.77%), Andhra Pradesh (60.30%), Lakshadweep (62.57%), and Kerala (58.22%) report much higher female enrolment than male. This underscores strong participation of women in higher education.
4. Larger and more educated states show almost equal enrolment by gender. In Tamil Nadu, 48.73% of enrolees are female; in Karnataka, it's 48.78%; in West Bengal, 49.48%; and in Uttar Pradesh, 48.86%. These figures suggest narrowing gender gaps at higher enrolment levels.
5. Transgender enrolment remains very low in all states, typically below 0.2%. This situation highlights the need for specific policies and inclusive measures to improve access to higher education for transgender students.
6. Uttar Pradesh has the highest number of female teaching staff, showing its large size in the higher education system. However, the percentage of female staff is still low compared to other states, indicating a gap between size and gender representation.
7. The Andaman and Nicobar Islands have the highest percentage of female teaching staff at 68.42%, followed by Kerala and Punjab. This highlights that smaller states and union territories often have better gender inclusivity, even if their total numbers of faculty are lower.
8. The paired t-test results show no significant difference between Male and Female GER over the study period. This confirms almost equal gender participation in higher education enrolment at the national level.
9. The one-sample Z (t) test shows that the proportion of female enrolment is significantly higher than that of male enrolment in several states. This demonstrates that females dominate higher education participation at the state level.
10. There is no notable difference in the percentage of female teaching staff across higher education institutions in India. This shows that the representation of women among faculty is statistically similar in the North, South, East, and West regions.

## Suggestions of the Study

1. Large states with low female faculty percentages, like Uttar Pradesh and Bihar, should adopt gender-sensitive recruitment and promotion strategies to narrow the gap in women's representation in teaching positions.
2. Frameworks dedicated to including transgender students should be established, offering scholarships, campus support systems, and favourable admission policies to address their low participation in higher education across all states.

## Conclusion

The study points out a positive change in gender participation in Indian higher education. Female GER has steadily increased and outpaced male GER in recent years, reflecting better access and participation. Some states now show higher female enrolment, while larger states approach gender parity. Despite advancements in student enrolment, transgender participation remains critically low, highlighting systemic exclusion. The review of teaching staff indicates that numerical dominance does not necessarily mean proportional gender equity. Smaller states and union territories display better inclusivity among faculty. Statistical tests show nearly equal male and female GER at the national level. Regional analysis reveals no significant differences in female faculty representation across India. Overall, the results suggest that while gender gaps are closing, specific and inclusive policies are crucial to achieving real gender equity in higher education.

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