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Women in Higher Education in India: An Empirical Study

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Abstract

In this communication we have discussed how the expansion of Indian universities and colleges has been a cause of the increased participation of women in higher education, particularly in male-dominated areas like STEM. The enrollments in different subjects show a decrease in the gender gap, with women enrolling in post-graduate courses outnumbering men. This is an indication of changing attitudes in Indian society, where women are aspiring for higher education and professional opportunities in greater numbers. Government policy, awareness initiatives, economic imperatives, and social acceptance have all played their part in creating this change. However, the gaps still exist, driven by patriarchal thought, economic needs, safety, and lack of support. Women students are faced with the limitations of job prospects in scientific disciplines and social pressure on marriage and family responsibilities. Reservation policies in favor of supporting certain groups like SC and ST students have, in some cases, helped close the gender gap. The idea of science education as a secure and socially desirable activity for girls has led to higher enrollment. Raising funds for financial assistance, improving security on campus, and increasing career opportunities based on research can help in addressing these issues. International collaborations, scholarships, and mentoring programs can help facilitate women seeking higher education in India, empower them, and bring about gender equality in the workforce.

Keywords: Empowerment, Enrollment, Gender gap, Higher Education, Women education.

Introduction

The core component of education is literacy. It is essential to both national identity and social cohesiveness. It results in increased engagement from the underprivileged in a democratic system and an enhancement in the spectrum and intensity of public opinion (1-3). Education above the secondary level is referred to as higher education. A common misconception is that higher education is what colleges and universities offer. However, professional schools in the fields of law, theology, medicine, business, music, and art are really part of higher education institutions (4, 5). It encompasses other establishments such as Technological Institutions and Teachers' Training Schools. Furthermore, higher education institutions of all kinds that teach highly qualified experts in the fields of economics, science, technology, and culture are referred to as higher education institutions since these universities accept applicants who have finished their secondary education on campus. Thus, education at the bachelor's level and above is generally referred to as "Higher Education". Education has an immediate impact on women's empowerment since it raises their understanding of their rights, skills, and the options and possibilities accessible to them (6, 7). According to studies, there is a strong relationship between female education and multiple cognitive indicators, including increased economic productivity, improved health, marriage at the appropriate time, lower fertility, increased engagement in politics, and fruitful investments to the upcoming generations (8, 9). No civilization has ever achieved economic, political, or social freedom without a strong foundation of educated women.

Developmental strategies and initiatives that fail to tackle gender inequality miss out on important

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developmental possibilities (10, 11).

Women education is important not just for social fair reasons, but also because it boosts societal transition. Promoting equal opportunity for women in education is critical for the advancement of human resources. By teaching a woman, you educate the entire family (12). Given that a woman bears the entire family's duty, an educated woman is better equipped to care for her children's health, nutrition, and education, as well as be an active actor in the country's social and economic growth. It is obvious that educational accomplishment is the foundation of all economic success (13).

Over the past forty years, the number of women enrolled in higher education has increased approximately twice as quickly as that of males. Despite these advancements, it has been noted that the proportion of women in higher education is falling and lagging behind men, especially in research and administrative roles (14).This article looks at the current situation of female access to higher education in India by examining participation constraints related to enrolment patterns, socioeconomic status and geographical differences, and. It investigates how institutional obstacles, governmental regulations, and cultural views affect women's access to higher education. It also lists the achievements to date and points out areas in which more development is required to guarantee women all throughout the nation fair access to higher education. To gain insight into the patterns and differences in women's access to higher education, this study draws on important theoretical viewpoints. Feminist educational theory highlights how educational systems often reflect and continue gender inequalities, while also offering potential for women's empowerment and action. Gender stratification theory helps explain how societal norms and structures that favor male dominance across institutions have an impact on access to educational opportunities. Also using Bourdieu's idea of cultural capital, the paper looks at how unequal access to cultural resources—like language, parents' education, and exposure to academic settings—can shape women's educational paths in marginalized communities. These frameworks guide how we interpret the observed gender gaps across caste, class, and academic fields.

To fully appreciate the current landscape of women's participation in higher education, it is essential to examine its historical trajectory. In India, major social, cultural, and political shifts over the ages have influenced women's access to education. Although formal education for women was an idea that existed in some aristocratic circles in ancient India, it was frequently restricted to a select few privileged segments of the population. In particular, given the broader patriarchal framework, women's education was neither promoted nor widely available.

Pre-Colonial Period: In pre-colonial India, women's access to education was largely restricted to religious and family knowledge, which was transmitted orally. Women in royal or aristocratic clans did, however, receive education training, specifically in literature, music, and the arts. There was, nevertheless, no institutionalized framework for the provision of women's access to higher education. Culturally, the need for women to continue household duties and serve other individuals enormously restricted women's chances for gaining formal educational access (15-17).

Colonial Era

Major developments in women's education in India started during the colonial era. The most significant among them was the introduction of a modern education system by the British government and social reform movements (18).

Post-Independence Era

India's independence in 1947 marked a new chapter for women's education. The Constitution of India guaranteed the right to education for all, and specific provisions aimed to uplift marginalized groups, including women. Key reforms were introduced to promote education for all citizens, but women, especially in rural areas, continued to face significant barriers due to prevailing gender norms and economic challenges. In 1951, shortly after independence Literacy rates were extremely low (27.15% for males and 8.86% for women) (19). Over the next ten years, there was no improvement in literacy rates. The idea that educating females may hasten social transformation did not arise until the guidelines of the Indian Education Commission (1964) and the National Policy of Education (1968). The number of colleges and universities also increased, and more women began to pursue higher education. The 1986 National Policy on Education (NPE) and its Program of Action (POA) made gender equality

a top priority and vowed to use the whole educational system to support the empowerment of women (20). This viewpoint is restated in the National Perspective Plan 1988-2000, which also emphasizes that women voluntarily must overcome the challenges they face. Consequently, education for gender equality has been carefully articulated, and this can be seen in the discourse around educational policy (21).

Contemporary Progress

In the latter half of the 20th century and into the 21st century, the participation of women in higher education increased significantly. The introduction of affirmative action policies, the spread of scholarship programs for women, and societal changes have all contributed to this growth. One of the noteworthy policy, National education policy (NEP) is a game changer for Indian education systems it emphasizes on inclusiveness, equity, and quality.one of the key objective of NEP 2020 is to abridge gender gap specially in field of higher education. It accentuates the significance of empowering women through quality education and foster overall growth of society. Nevertheless, women's representation in fields like engineering, technology, and leadership roles in academia remains limited, and socio-economic barriers continue to restrict access for many (22, 23). This historical trajectory reflects the persistent struggle for women's access to education and the evolving recognition of its importance for India's development. The ongoing challenge is to ensure not only access but also equitable opportunities for women in diverse academic fields.

Methodology

This study presents a quantitative and descriptive research design to inspect the status of women in higher education in India. The key objective of this article is to investigate enrollment of women across different disciplines, educational levels, social groups and institutions over the few past years. All the data have been collected free of cost from Ministry of Education, GOI, All India Survey on Higher Education report 2021-22 (AISHE-2021-22) and National Sample Survey Office(NSSO), Ministry of Statistics and Program Implementation, Government Of India. The data spans five years from 2017–18 to 2021–22, enabling longitudinal analysis of trends and change. These sources give total enrollment data over a broad range of variables including gender, caste (General, SC, ST, OBC), minority groups (e.g., Muslim, other minorities), level of education (UG, PG, PhD), and institution type (government, private-aided, unaided, and standalone). As the research draws on secondary data, no independent exclusion or sampling criteria were employed; the dataset represents the entire population of students enrolled in Indian higher education in the given academic year. Sample size calculation was thus not needed since the analysis is conducted on full census data as opposed to statistical sample. The application of supervised and large-scale official datasets guarantees extensive demographic coverage and increases the validity and generalizability of the results. These sources offer complete enrollment data in a broad range of variables like gender, caste (General, SC, ST, OBC), minority categories (e.g., Muslims, other minorities), degree of education (UG, PG, PhD), and institution type (government, private-aided, unaided, and standalone). Because this research utilizes secondary data, there was no independent exclusion or sampling criteria; the dataset covers the entire population of students enrolled in Indian higher education in the given academic year. As a result, no sample size calculation was needed since the analysis is conducted from the complete census data, not a statistical sample. The application of such formal and extensive datasets guarantees wide demographic coverage and boosts the validity and generalizability of results. The graphs and tables were plotted using Origin 8.5 Pro spreadsheet software to create visual representation of trends in enrollment and gender splits. Thematic and policy-focused interpretation was constructed based on trends within the dataset.

Results and Discussion

The number of colleges in India have grown by nearly 6000 and almost 250 plus new Universities got registered between 2017-18 to 2021-22 which can be evident from Figures 1(A) and 1(B). More institutions have been constructed, especially in semi-urban and rural areas, significantly increasing access to high-quality education. One of the key observation from Figures 1(A) and 1(B) can be inferred is that the number of colleges and universities in India have grown significantly post year 2020. This could be due to implementation of

National Educational Policies which promote greater infrastructure at all levels of education. Specialized women's universities and colleges, as well as co-educational institutions with women-friendly atmosphere, have prompted more families to invest in their daughters' education. This growth of educational infrastructure is critical to closing gender inequalities and promoting an inclusive learning ecology. The increasing number of colleges and universities in India has played a significant role in boosting women's enrollment in higher education.

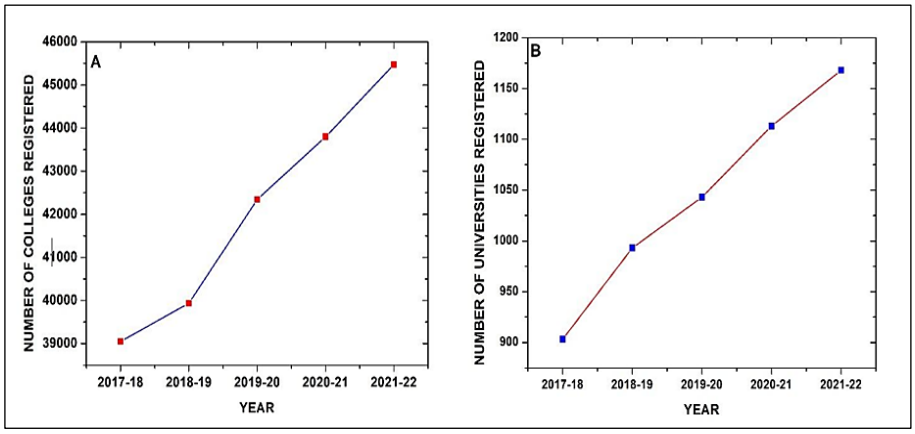

Figure 1: (A) and (B) No. Of Colleges and Universities Registered Per Year in India

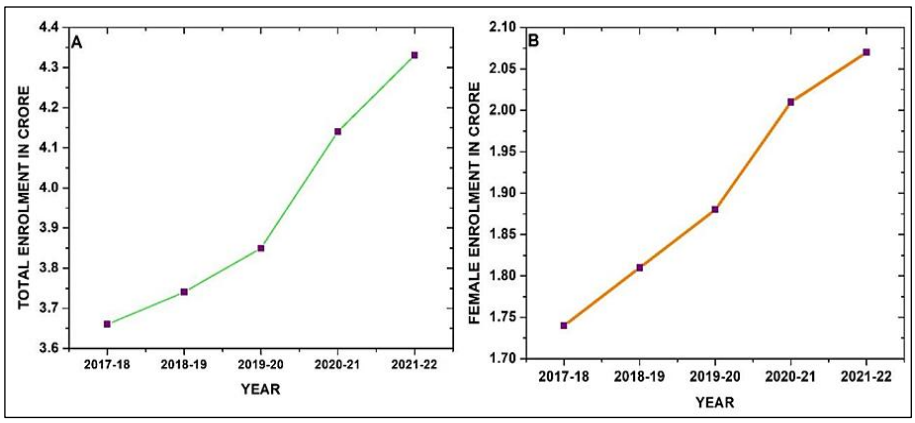

Figure 2: (A) and (B) No. of Total Enrolment Per and No. Of Female Enrolment per Year in India

Figures 2(A) and 2(B) show that women's enrolment in higher education in India increased steadily between 2017- 18 and 2021-22. Significant development in traditionally male-dominated disciplines such as STEM (Science, Technology, Engineering and Mathematics), yet inequities remain. Enrolment data for men and women are being compared, and the gender gap is closing. From Figure 2 one can infer that gross enrollment as well as women's enrollment for higher education has gained momentum. Among all other factors, NEP 2020 could be responsible for such wonderful development in enrollment data. One of key objective of NEP is to obtain GER (Gross Enrollment Ratio) of 50% for higher education by the year 2035 and to induce larger enrollment of women in male dominating disciplines like STEM. Factors which have contributed to boost the enrollment of women in higher education can be classified as:

Government Initiatives

The Central government and various State government have reservation policies for women in higher education. Various scholarships like AICTE (All India Council of Technical Education) Pragati Scholarship, Indira Gandhi scholarship, Women Techmakers scholarship etc. also boost the enrollment of women in higher education (24).

Increased Awareness

Families especially in urban areas and semi-urban areas start recognizing the importance of educating daughters. Also changing societal attitudes toward gender roles helps in rise of enrollment of women.

Institutional Efforts

More women-friendly infrastructure (e.g., hostels,

safety measures) and flexible learning options and support systems like daycare centers on campuses attracts women to get admission in higher education.

Economic Factors

Rising aspirations for better careers and economic independence among women.

The enrollment of women in higher education has been steadily increasing over the years as shown by the Figures 3 (A) and (B), reflecting progress toward gender equity. At the undergraduate (UG) level, while the number of female enrollments remains lower than that of males, the gap has been narrowing gradually. Many factors have contributed to this, including government key policies like NEP 2020, national scholarships, awareness campaigns, and improved access to rural and semi-urban educational institutions.

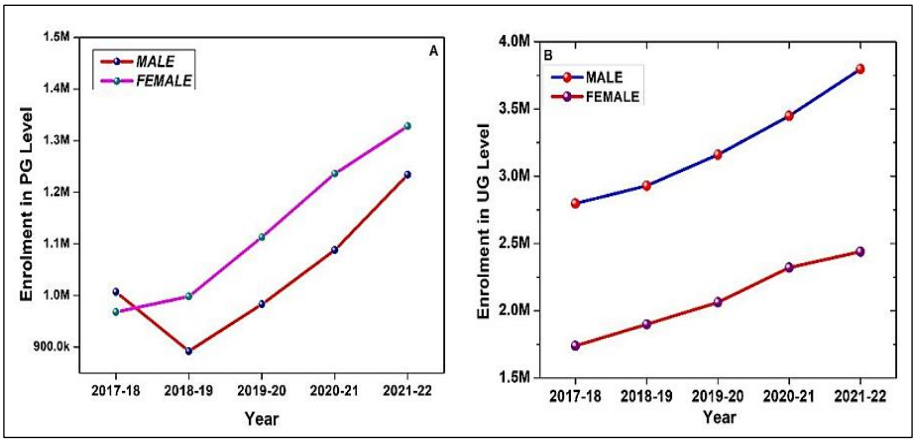

Figure 3: (A) Year Wise Enrolment in Post Graduate Courses, (B) Year Wise Enrolment in Undergraduate Courses

Here in Figure 3 one can again notice the significant rise in women's enrollment number at PG level post year 2020. Despite this growth, some regions still limit female participation at the undergraduate level due to cultural and economic factors. Interestingly, the trend is reversed at the postgraduate (PG) level, with female enrollments outpacing male enrollments. This trend indicates growing ambitions of women towards higher studies and career avenues. The reasons for this are a growing emphasis on skill development, professional upgradation, and increased societal acceptance of women pursuing higher studies. Furthermore, the availability of women-friendly infrastructure, flexible courses, and support mechanisms like research fellowships have encouraged more women to pursue PG courses. This trend indicates the requirement to evolve a respectful and supportive learning culture. By overcoming challenges at the UG level and maintaining this momentum at the PG level, India can ensure that more women make a significant contribution to the social and economic development of the country.

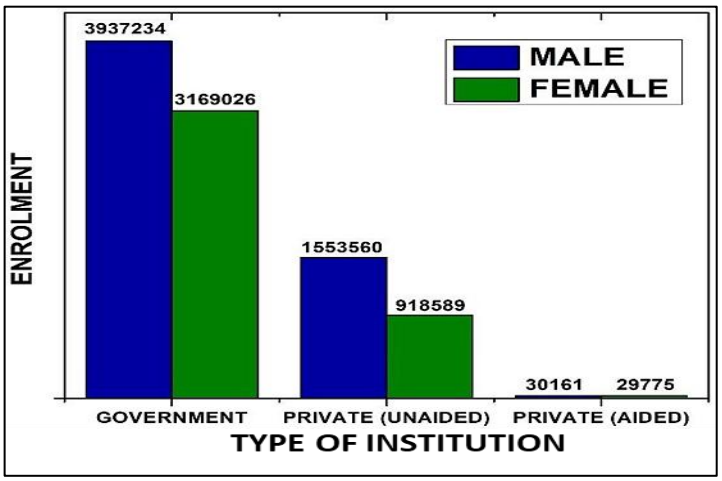

Figure 4: Enrolment in Different Type of Universities

Figure 4 illustrates the gender-based enrolment disparity among government, private, and aided universities in India. There is a clear pattern: male enrolment surpasses female enrolment across all categories. The gender gap is greatest among students enrolled at government institutions, where 3,937,234 males and 3,169,026 females are enrolled. In private unaided universities, the disparity is even more pronounced, with 1,553,560 males enrolled compared to 918,589 females. The numbers of private aided institutions are relatively balanced, but there is still a slight male dominance in the student body. Though the cost of education at government institution in comparison to private institution is very low. But, still the existence of gender gap at govt. institution is higher as compared to private institutions. This clearly indicate failure of government policies and societies to provide conducive environment for female education. Possible Causes of the Gender Disparity among different type of universities:

Socio-Cultural Barriers: The societal norms and patriarchal mindsets of many parts of India prioritize male education over female education. In rural areas, some families place a high value on the higher education of their sons while restricting the education of their daughters to domestic duties or early marriage.

Financial Constraints: Economic constraints force the parents to admit a single child to school and, in that case, the priority goes to the son. Private unaided schools, owing to being expensive, face a sharper decline in female admissions due to financial constraints.

Safety Concerns and Mobility Issues: Families often have concerns about sending their daughters to colleges or universities that are far from home. They worry about safety issues, the condition of the dormitories, and unreliable transportation. Because of these concerns, they tend to avoid choosing distant educational institutions for their daughters.

Lack of Institutional Support: In colleges and universities, women are faced with numerous challenges that prevent them from enrolling and participating in higher education. Sexism against women can make them feel unwelcome or unappreciated. The majority of female students do not have mentors who guide them during their studies, and this becomes a barrier for them to advance. There are also fewer women in leadership positions, and thus fewer women for female students to emulate and follow. These challenges can discourage women in general from seeking higher education and participating actively in academic environments.

Potential Solutions to Bridge the Gap

Financial Incentives and Scholarships: Women should be given more access to need-based scholarships and financial aid by the government and private organizations. The reduction of tuition fees for women in STEM fields and other male-dominated fields may also encourage them to enroll (25).

Strengthening Safety and Infrastructure: In order to ease safety concerns, universities should enhance security measures, provide safe transportation options, and build more female-friendly hostel accommodations.

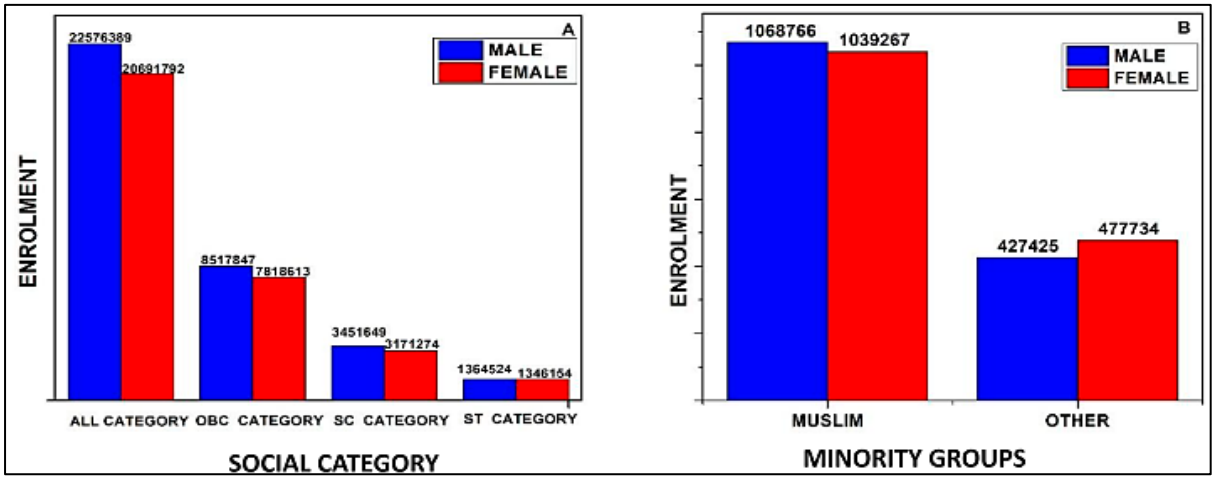

Figure 5: (A) Gender Wise Enrolment in for Different Social Groups, (B) Gender Wise Enrolment in for Different Minority Group

Awareness Campaigns and Community Engagement: Programs that highlight the benefits of educating girls, like improved job opportunities and higher social standing, can influence how parents perceive their daughters' education. Collaboration between community leaders and teachers can motivate more girls to pursue advanced studies. These initiatives demonstrate to parents that education can secure a better future for girls and benefit their families and communities. By focusing on the positive of education, these programs can gradually change traditional attitudes and expand opportunities for girls (25).

Policy-Level Interventions: To accommodate the unique challenges faced by female students, the government should implement stricter mandates for promoting gender balance in admissions, promoting gender-sensitive policies within educational institutions, and encouraging flexible learning options like online and hybrid courses (26). The graph illustrates gender-wise enrollment in higher education across different social and minority groups in India. It highlights disparities and progress in female enrollment among various communities.

Figure 5(A) presents enrollment figures for all categories, OBC, SC, and ST groups. While male enrollment is higher across all categories, the gender gap is relatively narrower among SC and ST groups. In the general category, male enrollment (22,578,338) exceeds female enrollment (20,641,792), indicating a persistent gender disparity. Among OBC students, the gap remains noticeable, with 8,517,847 males compared to 7,986,813 females. On calculating the gender gap percentage associated with enrollment of women in higher education, it was found that the gender gap is highest among general categories i.e 8.5%, followed by SC, OBC and ST category having gender gap of 8.1%, 6.2% and 1.3% respectively. The lowest gender gap is present among Scheduled tribes and OBC category has still gender gap close to general categories. Though, OBC, SC and ST category have lower gender gap in comparison to general category, the gross female enrollment among general category is greater than all other categories like OBC, SC, ST by 164%, 552% and 1337% respectively. Comparing total female participation percentage in higher education among all strata of society with their corresponding population percentage we can say that lower strata of society still lags in higher education. However, Among ST groups, the low gender gap suggests increased female participation in those communities. Several factors contribute to this trend:

Affirmative Action Policies: Reservation policies have increased access to education for SC and ST women.

Financial Assistance Programs: Scholarships and government schemes encourage female enrollment in these groups.

Cultural Factors: In some communities, higher education for women is gaining acceptance, reducing dropout rates.

Figure 5(B) shows enrollment among Muslim and other minority students. Interestingly, Muslim women's enrollment (1,039,267) is almost equal to men's (1,068,766), reflecting improved access. However, social norms, economic constraints, and early marriage still pose challenges. For "Other" minority groups, female enrollment (477,734) surpasses male enrollment (427,425). This may be due to increased educational awareness and targeted policies supporting girls' education in these communities. While gender disparities persist, especially in general and OBC categories, the data suggests progress among SC, ST, and minority women. Expanding financial aid, strengthening community awareness, and promoting gender-sensitive policies are crucial to ensuring equitable access to higher education for all women in India.

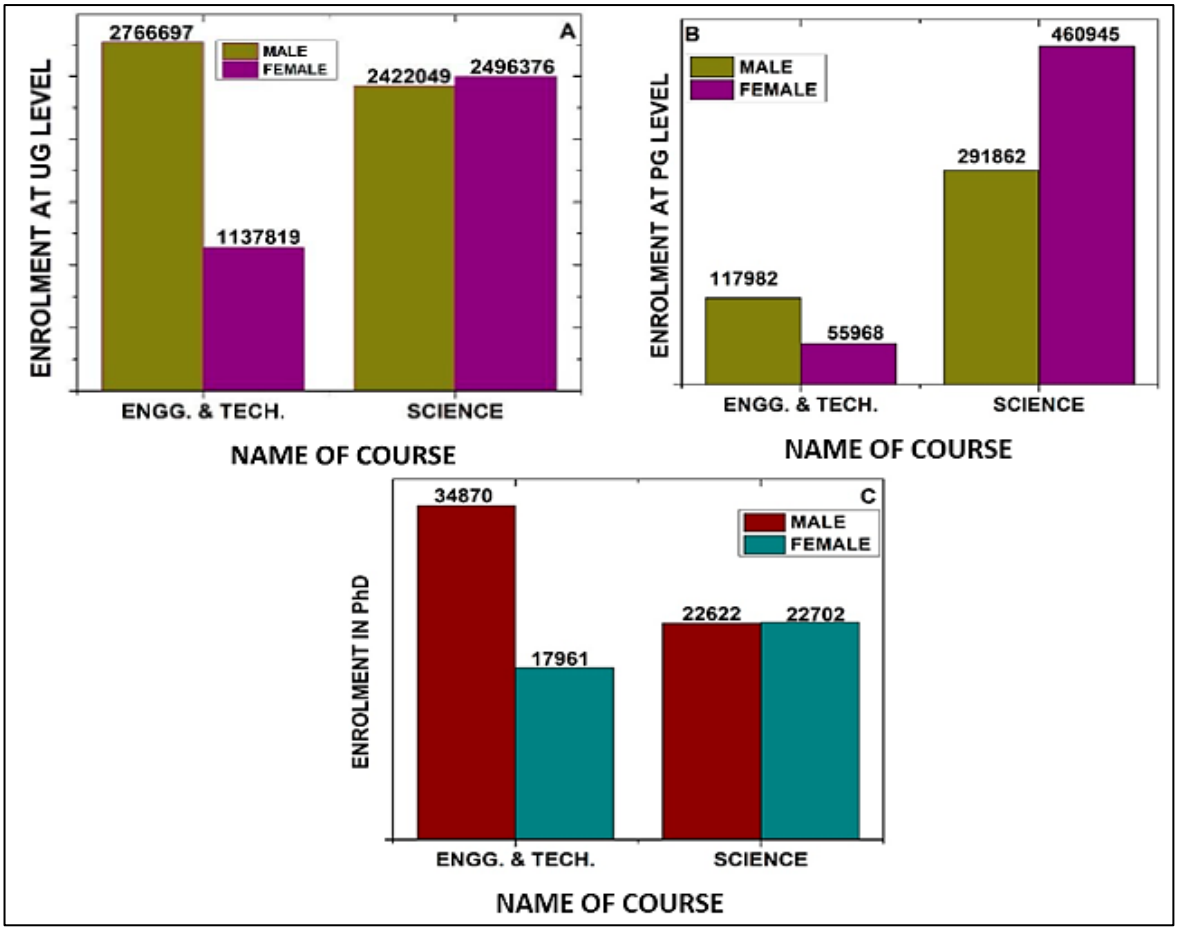

Figure 6: (A)Gender Wise Enrolment in UG Courses in Science and Engineering, (B)Gender Wise Enrolment in PG Courses in Science and Engineering, (C)Gender Wise Enrolment in PhD in Science and Engineering

Figure 6 (A), (B) and (C) illustrate gender-wise enrollment trends in Science and Engineering and Technology at the UG, PG, and PhD levels in India. In undergraduate courses, male enrollment in Engineering and Technology is significantly higher than female enrollment. However, in science, female enrollment surpasses male enrollment. This pattern continues at the postgraduate level, where Engineering and Technology still has a gender gap favoring males, but Science sees a much higher number of female students. At the PhD level, the trend changes again—male enrollment in Engineering and Technology is almost double that of females, while in science, the numbers for both genders are nearly equal. One significant reason for the higher number of females in Science UG and PG courses is societal expectations. Many parents enroll their daughters in general degree colleges and universities for B.Sc. or M.Sc. degrees, often with the primary goal of improving their marriage prospects rather than encouraging careers in science (27). Compared to technical or professional courses like engineering, science degrees are considered safer and more socially acceptable for women (28). The graphs show that student numbers drop significantly from undergraduate (UG) to postgraduate (PG) and further to PhD programs. Many students end their education after UG because of money problems, lack of career drive, or needing to earn income. At the PhD level, the drop is even more pronounced, especially for women. They often face additional challenges like societal pressure to marry, family responsibilities, and the long-term commitment that research requires, making it tougher for them to pursue a PhD (29).Women should be promoted to pursue STEM careers through awareness programs, financial incentives, such as scholarships and fellowships, and flexible PhD programs with a better work- life balance (30, 31). Collaboration between industry and academia can also lead to more career opportunities in research and academia, creating a more viable and attractive choice for women (32).

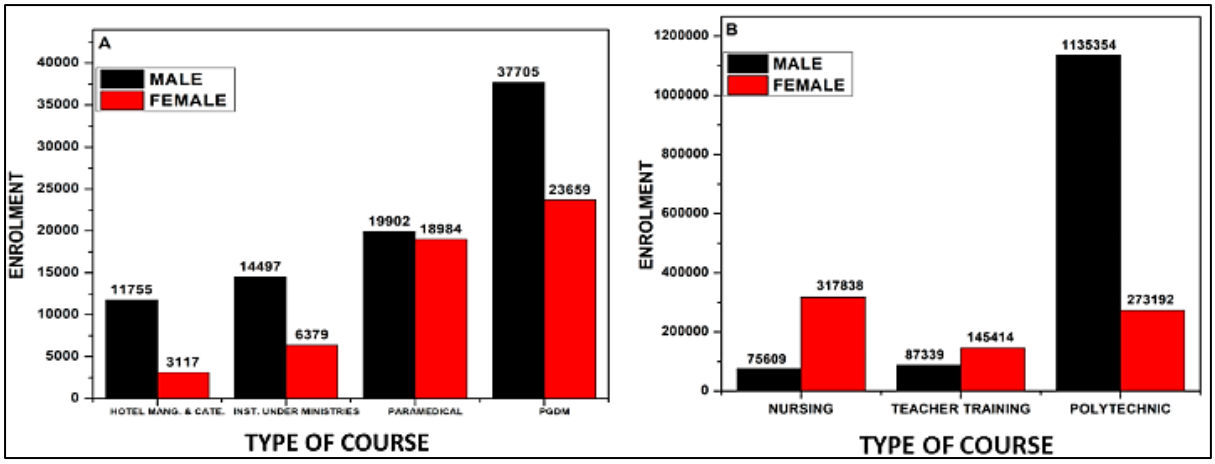

Figure 7: (A) and (B) Gender Wise Enrolment in Different Stand-Alone Courses in India

The graphs present gender-wise admissions in standalone institutions in India is shown in Figure 7 (A) and 7 (B), revealing widespread imbalances in various fields of study. Male admissions are significantly bigger in polytechnic, paramedical, and hotel management degrees, whereas female admissions are bigger than male admissions in nursing and teacher training degrees. This trend is in line with conventional societal norms that dictate career choices on the basis of gender. Polytechnic degrees reveal a huge male dominance, which reflects a strong inclination towards technical education among males, as these degrees are linked with career prospects in engineering, manufacturing, and industrial sectors. Conversely, female admissions are higher in nursing and teacher training, which is in line with the stereotype that women are more suited to caregiving and teaching professions. This preference is driven by societal expectations that women should enter professions deemed stable, respectable, and family-friendly. Paramedical courses show a relatively balanced gender ratio, suggesting a gradual shift toward inclusivity. However, male enrollment still outnumbers female participation, possibly due to job market perceptions. Hotel management courses also have a male majority, likely because of industry biases that associate managerial roles with men. To address these disparities, targeted policies promoting gender diversity in technical and vocational education are necessary. Awareness campaigns should challenge stereotypes and encourage women to enter male-dominated fields such as polytechnics. Scholarships and mentorship programs can support female students in STEM and technical education, while promoting skill-based training for men in nursing and education can foster inclusivity (29, 32). A balanced higher education landscape will not only empower women but also enhance gender equity in India's workforce.

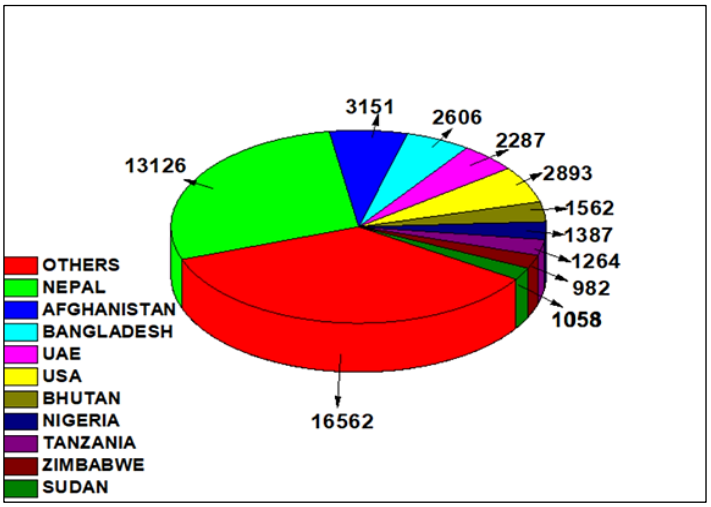

Figure 8: Enrolment of Foreign Students in All Courses across the Globe

Figure 8 presents data on the enrollment of foreign students in various courses in India. A significant observation is that most foreign students in India come from neighboring Asian countries like Nepal, Afghanistan, and Bangladesh, as well as several African nations such as Nigeria. This trend indicates that India's affordability plays a crucial role in attracting students from economically weaker regions. Compared to Western countries, the cost of tuition, accommodation, and daily living in India is much lower, making it an attractive option for students from developing nations. However, the graph also highlights a major concern, the relatively low number of students from developed regions such as Europe, North America, Australia, and even the Middle East. While India has many prestigious institutions, the overall perception of its education system on a global scale still lacks the recognition enjoyed by universities in the US, UK, or other developed nations. One key reason could be the varying quality of higher education institutions across the country. While IITs, IIMs, and a few other universities hold global rankings, many institutions lack sufficient research facilities, infrastructure, and international faculty, limiting their global appeal. Another factor that may deter foreign students, particularly women, is safety concerns. India has received criticism for issues related to women's security, and this could be a decisive factor for female students when choosing a study destination. Ensuring safety on university campuses, providing dedicated international student services, and enforcing strict policies against harassment can help improve India's reputation in this regard (33).To make India a more attractive destination for students across the globe, several steps must be taken. First, there should be a focus on enhancing the quality of education through better faculty training, research opportunities, and international collaborations. Indian universities should aim for more global accreditations and partnerships with top-ranking institutions worldwide (34). Additionally, improving student exchange programs and increasing scholarships for international students can help diversify the student population. By addressing these issues and improving infrastructure, curriculum, and safety measures, India has the potential to become a global hub for higher education, attracting students not only from Africa and Asia but also from Europe, the Middle East, and Australia (34).

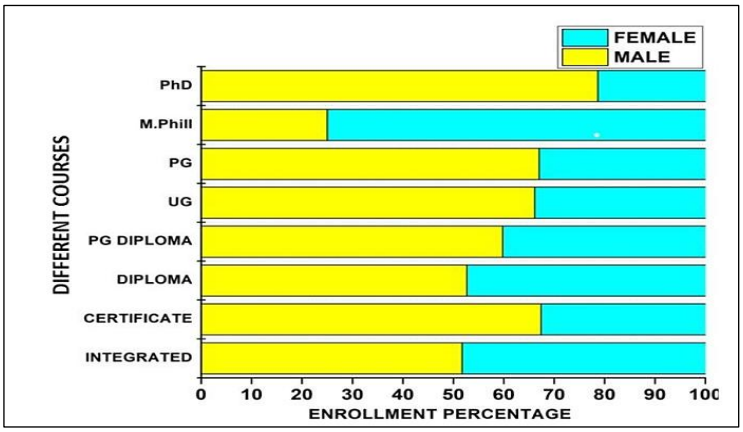

Figure 9: Gender Wise Enrolment of Foreign Students in Different Courses

Figure 9 presents gender-wise enrollment of foreign students in different courses in India, showing a significant gender gap. Male students consistently outnumber female students across all levels, with the largest disparity at the undergraduate (UG) level (23,204 males vs. 11,882 females). Even at the postgraduate (PG) level, the trend persists (4,972 males vs. 2,444 females), and the gap is even wider in Ph.D. programs (1,597 males vs. 433 females). This indicates that fewer women pursue higher education in India, particularly at advanced levels. Several factors contribute to this imbalance. Safety concerns remain a major issue, as India has faced global scrutiny regarding women's security. Cultural and societal restrictions in some countries also limit women's mobility for education. Additionally, financial constraints and a lack of dedicated scholarships for female students may discourage women from pursuing higher studies in India.

Inadequate hostel facilities and support systems further contribute to this gap (33). To curtail this divide, India must implement gender-sensitive policies, improve campus security, and provide more scholarships and mentorship programs for women (35). Strengthening international collaborations, promoting women-centric research opportunities, and highlighting success stories of female scholars can encourage more women to pursue higher education in India (34).

Figure 10 illustrates the number of female teachers per 100 male teachers in Indian colleges and universities across various social and minority groups. The overall female-to-male ratio for all categories is 77. The highest representation is seen in the "Other Minority" category [159], while the lowest is among Persons with Disabilities (PWD) at 54. STs [78], OBCs [73], SCs [61], and Muslims [61] show significant gender disparities in faculty positions. Few reasons for this gender based biasing are listed below; Gender Bias in Hiring – Institutional biases favor male candidates, especially in STEM fields and leadership roles.

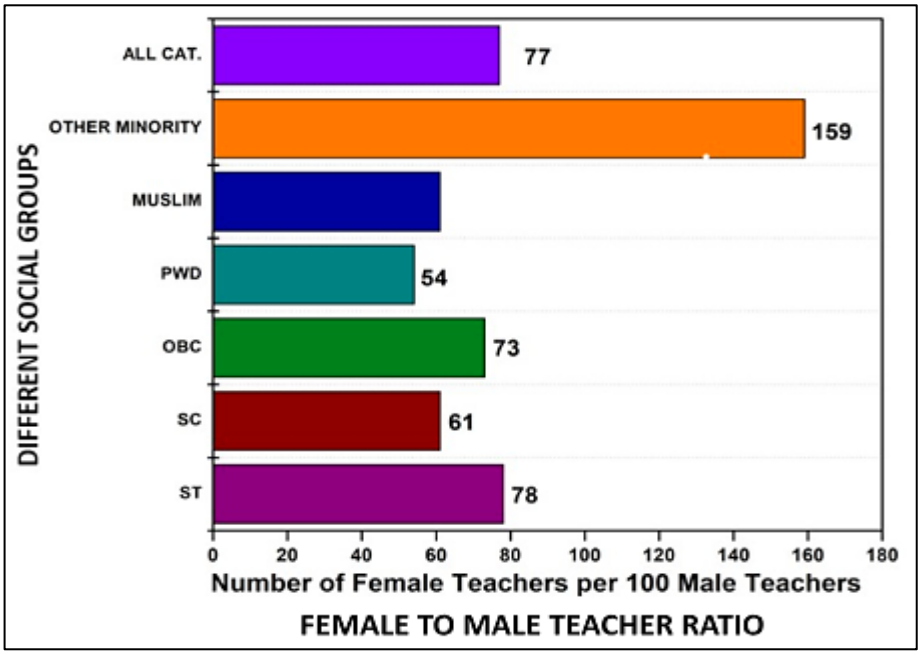

Figure 10: Number of Female Teachers per Hundred Male Teachers for Different Social and Minority Groups

Social Expectations and Mobility Restrictions: Many women face societal restrictions, limiting their ability to pursue higher education and academic careers.

Lack of Institutional Support: Insufficient maternity leave, inadequate childcare, and workplace harassment deter women from long-term academic careers.

Limited Female Participation in Higher Studies: Fewer women enroll in Ph.D. programs, leading to a weaker pipeline for female faculty positions.

Work-Life Balance Issues: Women often struggle with family responsibilities, forcing them to leave academia prematurely.

To curb these kinds of biasing we need to focus on; gender-sensitive hiring policies to promote balanced faculty representation, better institutional support, including childcare and flexible work arrangements, incentives for female higher education enrollment to strengthen the talent pipeline and mentorship and leadership programs for women in academia. A lack of female teachers negatively impacts girls' enrollment in higher education, as they lack role models and a comfortable learning environment. Increasing female faculty representation can significantly boost women's participation in higher education (36).

Figure 11 shows the number of female non-teaching staff per 100 male non-teaching staff in Indian colleges and universities across different social and minority groups. The overall ratio is 77.6, indicating a gender gap in administrative and support roles. The highest representation is observed in the "Other Minority" category (139.4),

while the lowest is among Muslims [56.7]. The ratios for other groups are ST [87.6], SC [90.6], OBC [79.3], and PWD [65.2], highlighting disparities across categories. The relatively higher representation of women in non-teaching roles compared to teaching positions suggests that women are more likely to be employed in administrative, clerical, and support services rather than in academic or leadership roles. This reflects the persistent gendered employment patterns in higher education institutions, where women are often steered towards lower-paying, less authoritative positions (37). To address this disparity, institutions should implement gender-inclusive hiring policies, encourage women's participation in leadership roles, and provide skill development programs. Increasing female representation in both teaching and non-teaching roles is crucial for fostering an inclusive and equitable academic environment.

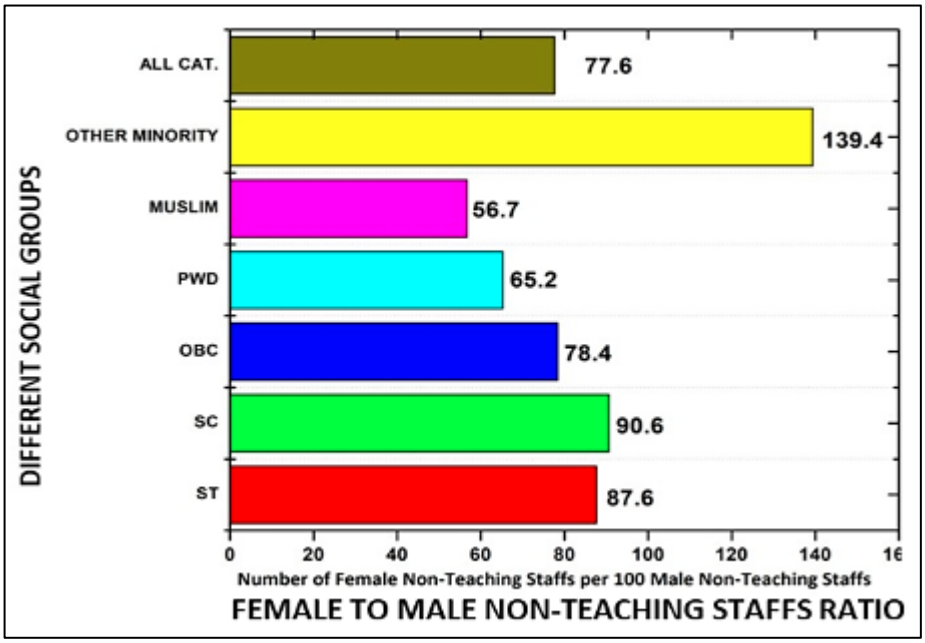

Figure 11: Number of Female Non-Teaching per Hundred Male Non-Teaching for Different Social and Minority Groups

Conclusion

With increase in number of colleges and universities in India, women's enrollment in higher education have increased. There is significant rise in number of women enrollment in male dominating disciplines like STEM. Enrollment data of all fields of education clearly demonstrates shrinking gender gap. However, female registrations at post-graduation level have outpaced male enrollments. This reflects transformation in feminine thoughts of Indian society as women are now aspiring for higher education and extraordinary career avenues. Such shift in progressive thought of women is result of government initiatives, increased awareness, institutional efforts, economic factors, emphasis on skill development and societal acceptance of women pursuing higher education. Government efforts for better women friendly infrastructure, flexible courses and research fellowship have given a push in women enrollment in higher education. This study about participation of female in higher education also gives insight about ground level implications of NEP 2020 because post year 2020 we can see that there is significant expansion in higher education infrastructure in the country, increased gross enrollment ratio, reduction in gender gap, increased gender inclusion etc. All these parameter of female education are also key objectives of above mention NEP 2020. However, gender disparity still exists in Indian society despite of all above mentioned efforts. Some of the key reasons for existence of gender gap in enrollment data of men and women in higher education are patriarchal mindset of Indian society, economic constraints, safety concerns of females, scarcity of women friendly environment in university campuses, lack of institutional support. Additionally, societal pressure like

marriage, family responsibilities have led female students to drop their plan of higher studies. The sad reality of students obtaining their PhD, post-graduation and graduation in science are not getting job opportunities in field of science has also ruined the dreams of pursuing higher education and enhanced dropout ratio among women especially. Gender gap is relatively narrower among SC and ST groups. This could be due to reservation policies in jobs, scholarships for SC and ST students and better acceptance for women among such communities. Male enrollment in higher education dominates in almost all fields of education except science and some other field like nursing and teacher training. Female students enrollment in science has increased because it is considered to provide safety and acceptance in society for girls. The girls graduated from science is assumed to have better marriage prospects and societal acceptance. All these problems could be addressed by adopting certain measures like improving financial incentives and scholarships, intensifying safety and infrastructure in campus, policy interventions for creating R and D based jobs, awareness campaign and community engagement for valued education of girls. Women safety concerns, lack of women centric infrastructure in Indian campuses beside lack of scholarships to foreign students have caused lower number of international female students pursing their higher studies in India. From the above discussion we can infer that though several government policies like those of NEP 2020 have been announced but its successful implementation is yet to be done. This present study also marks the adversaries associated with female education in relevance to NEP. Few of them which has been mentioned above are socio-cultural barriers, economic barriers, safety and security concerns , lack of gender sensitive infrastructure, geographical barrier etc. All these mentioned problem with female education are actually challenges associated with NEP.

To curtail the sense of insecurity among female students, India must adopt gender-sensitive policies, ameliorate campus security, and provide more scholarships and mentorship programs for women bring to reduce dropouts. Strengthening international collaborations, promoting women-centric research opportunities, and highlighting success stories of female scholars can encourage more women to pursue higher education in India. Diminishing gender disparity in higher education will not only empower women mentally, financially but also improve gender equity in India's workforce.

Abbreviations

AICTE: All India Council of Technical Education, NPE: National Policy on Education, NSSO: National Sample Survey Office, OBC: Other Backward Caste, POA: Program of Action, SC: Schedule Caste, ST: Schedule Tribe, STEM: Science Technology Engineering Mathematics.

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Author Contributions

Mrityunjay Kumar: Conceptualization, Research Design, preparation of original draft, Rahul K Singh: Data Collection, Statistical Analysis, Nisha Singh: Literature Review, Editing, Manoj Kumar: Plotting of graphs, Refinement, Dilesh Joshi: Manuscript Preparation, Durgesh Dixena: Manuscript Preparation, Shravan K Netam: Manuscript Preparation, Shankar S Kashyap: Manuscript Preparation, Dwas Lal: Manuscript Preparation.

Conflict of Interest

The authors declare no conflict of interest.

Ethics Approval

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