

Gendered Inequalities in Higher Education: Structural Barriers, Career Trajectories, and Institutional Practices in Uttarakhand

Chaudhary S^{1*}, Joshi A²

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^{1*} Sonika Chaudhary, Research Scholar, Faculty of Management Studies, Kumaun University, Nainital, Uttarakhand, India.

² Amit Joshi, Professor and Dean, Faculty of Management Studies, Kumaun University, Nainital, Uttarakhand, India.

Gender equality in higher education is increasingly measured through women's access and participation; however, numerical expansion does not necessarily imply equality in educational progression, academic employment, career advancement or institutional leadership. This study examines gendered inequalities in higher education in Uttarakhand through a longitudinal secondary-data framework. The study integrates evidence from the All India Survey on Higher Education (AISHE), Periodic Labour Force Survey (PLFS), NITI Aayog reports and relevant policy and institutional documents. The analysis focuses on five interconnected dimensions: participation, disciplinary distribution, academic progression, faculty representation and career advancement. Particular attention is given to the transition from educational participation to academic employment and senior academic positions. The findings indicate a complex pattern. Uttarakhand has comparatively strong female participation in higher education: in 2021–22, female enrolment in universities and colleges was approximately 2.82 lakh compared with 2.86 lakh male enrolments, producing a near-balanced gender distribution. The state's higher-education Gender Parity Index was approximately 1.09, above the national value of 1.01. However, gender parity in student participation does not automatically translate into parity among academic staff. In 2021–22, women constituted approximately 40.0% of the state's reported higher-education teachers, while their representation fell to approximately 26.2% among professors and 35.3% among associate professors. The study therefore identifies a transition from access equality to career inequality, suggesting the presence of a gendered academic pipeline in which disparities become more visible at higher career levels. The paper argues that gender-responsive higher-education policy in Uttarakhand needs to move beyond enrolment targets towards institutional accountability, career progression, mentoring, research support, childcare, transparent promotion systems and leadership development. The study contributes a state-specific analytical framework for understanding gender inequality as a cumulative institutional process rather than a single participation gap.

Keywords: Gender Inequality, Higher Education, Glass Ceiling, Gender Parity, Institutional Practices

Corresponding Author

Sonika Chaudhary, Research Scholar, Faculty of Management Studies, Kumaun University, Nainital, Uttarakhand, India.
Email: dagarsonikamba@gmail.com

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1. Introduction

Higher education has increasingly been recognised as an important instrument for achieving gender equality, economic empowerment and social transformation. Expansion in women's access to universities and colleges is often regarded as an indicator of social progress because higher educational attainment can improve employment opportunities, economic independence, social mobility and participation in decision-making. However, increasing women's participation in higher education does not necessarily eliminate gender inequality. The contemporary gender-equality debate has therefore moved from a narrow concern with access towards questions of progression, representation, institutional power, career advancement and leadership.

This distinction is particularly important in the context of higher education. A higher proportion of women among students can coexist with lower representation among faculty, senior academics and institutional leaders. The phenomenon is commonly associated with the **leaky academic pipeline**, whereby women's representation gradually declines as individuals move from undergraduate education to postgraduate study, doctoral education, academic employment, senior academic positions and institutional leadership. Recent scholarship similarly argues that gendered academic career outcomes need to be understood as an interconnected ecosystem rather than through isolated indicators such as publication counts or representation at a single career stage (Acker & Armenti, 2004; European Commission, 2024; van den Brink & Benschop, 2012).

The Indian higher-education system provides an important setting for examining these dynamics. National statistics show considerable improvement in women's participation in higher education. According to AISHE, India's female Gross Enrolment Ratio (GER) increased from 22.9 in 2014–15 to 28.5 in 2021–22, and female GER exceeded male GER for the fifth consecutive year in 2021–22. At the national level, women constituted 43.4% of higher-education teachers in 2021–22.

Nevertheless, participation and career equality are not synonymous. Research on India demonstrates that gender segregation in education is linked to subsequent occupational segregation and wage differences (Agrawal, 2021).

Sahoo and Klasen (2021) found that girls in India are substantially less likely than boys to enter science and commerce streams relative to humanities, demonstrating that gendered educational trajectories begin well before entry into higher education.

The issue becomes more complex when academic careers are considered. Women may achieve substantial representation among students and junior academic staff while remaining underrepresented at senior ranks. Research on Indian higher education has identified persistent gender inequalities in academic promotion and leadership. Mayya et al. (2021), for example, found that women academics faced several barriers to assuming administrative positions, including geographical and workplace-related constraints. Similarly, research on Indian higher-education leadership indicates a very low proportion of institutions headed by women compared with those headed by men (Banker & Banker, 2023).

These issues are especially relevant to Uttarakhand. The state presents an interesting case because it combines relatively strong female participation in higher education with geographical, socio-economic and institutional characteristics that can influence educational and professional trajectories. The state's mountainous geography creates differences in institutional accessibility, mobility and educational opportunities between hill and plain regions. Such geographical factors may interact with household responsibilities, employment opportunities, migration and institutional concentration.

The available statistics suggest that Uttarakhand performs relatively well in terms of access. AISHE 2021–22 reported an overall higher-education GER of 41.8 for Uttarakhand, placing it among the states with comparatively high participation. NITI Aayog's analysis of AISHE data further shows that Uttarakhand's Gender Parity Index in higher education was approximately 1.09 in 2021–22, compared with 1.01 for India.

However, the apparent success in access raises an important research question: Does relatively high female participation in higher education translate into equality in academic careers and institutional power?

This study addresses this question by moving beyond enrolment statistics and examining the higher-education gender pipeline in Uttarakhand.

It investigates gender differences in student participation, academic employment, academic rank and institutional representation. The study also considers broader structural barriers, including geographical location, labour-market conditions, social expectations and institutional practices.

The study makes three contributions. First, it provides a longitudinal secondary-data perspective on gender inequality in Uttarakhand's higher-education system. Second, it shifts analytical attention from access to progression and advancement. Third, it integrates quantitative statistics with a discussion of institutional practices to demonstrate that gender inequality is cumulative rather than confined to a single stage of the educational system.

2. Literature Review

Gender inequality in higher education has increasingly been examined not merely in terms of women's access and enrolment, but also in relation to their academic progression, employment opportunities, career advancement, and representation in institutional leadership. Human Capital Theory suggests that education enhances individuals' skills, productivity, and economic opportunities (Becker, 1964). However, feminist scholarship argues that educational attainment does not automatically eliminate gender inequalities because institutional structures, social expectations, family responsibilities, and organizational practices continue to influence women's career outcomes. Thus, gender equality in higher education needs to be understood as a process extending from access and participation to employment, promotion, leadership, and decision-making.

Indian research demonstrates that women have made considerable progress in educational participation, but gendered patterns remain visible in the choice of academic disciplines. Sahoo and Klasen (2021) found that female students in India are substantially less likely than male students to choose science and STEM-related streams, even after controlling for several individual and household characteristics. Such educational segregation can subsequently influence occupational choices and earnings. Kumara and Sahoo (2023) further demonstrated that gender intersects with caste in shaping educational stream choices, indicating that women's educational opportunities cannot always be understood through gender alone.

These findings are particularly relevant for higher education because disciplinary choices influence access to particular occupations, research opportunities, and academic career pathways.

The literature on academic careers also points to a persistent "leaky pipeline," whereby women's representation decreases as individuals progress through successive stages of academic careers. Blickenstaff (2005) conceptualized this phenomenon in relation to women's participation in science, while subsequent research has shown that women may enter higher education in substantial numbers but remain comparatively underrepresented at senior academic and leadership levels. Acker and Armenti (2004) highlighted the importance of workload, career expectations, and institutional conditions in shaping women's academic careers. Similarly, van den Brink and Benschop (2012) argued that apparently neutral recruitment and promotion systems can reproduce gender inequality through informal networks, evaluation practices, and organizational cultures. Consequently, the lower representation of women in senior academic positions cannot be explained solely by differences in qualifications or individual career preferences.

Family responsibilities and the unequal distribution of care work are also important factors influencing women's academic trajectories. Academic careers often require geographical mobility, research productivity, networking, conference participation, and continuous professional engagement, which may conflict with socially assigned family responsibilities. Mayya et al. (2021), in their study of women faculty in India, identified family responsibilities, time constraints, mobility, limited professional networks, lack of mentoring, and institutional expectations as important barriers to women's participation in administrative positions. These factors indicate that women's career advancement is shaped by the interaction between professional requirements and social expectations rather than by educational qualifications alone.

Another important strand of research concerns women's representation in academic leadership. Although women constitute a substantial proportion of students and an increasing share of academic employees, their presence in senior administrative and decision-making positions remains comparatively limited.

Research on academic leadership suggests that informal networks, organizational cultures, gender stereotypes, unequal access to professional opportunities, and promotion procedures may restrict women's progression (van den Brink & Benschop, 2012). The literature therefore distinguishes between numerical representation and substantive equality: having more women within higher education does not necessarily mean that women enjoy equal opportunities to influence institutional decisions or reach senior positions.

The Indian literature further suggests that gender inequality is closely connected with labour-market structures. Gendered educational choices can contribute to occupational segregation, while social norms and family responsibilities may restrict women's labour-force participation even after educational attainment. Agrawal (2021) showed that educational and occupational choices contribute to gender differences in labour-market outcomes in India. This relationship is significant for higher education because academic participation represents only one stage of women's broader transition from education to employment and professional advancement.

Overall, the literature establishes that gender inequality in higher education is multidimensional. Existing studies have extensively examined women's participation, educational choices, academic careers, leadership, and work-family challenges, but there remains limited integrated evidence connecting these dimensions within the specific socio-economic and geographical context of Uttarakhand. In particular, insufficient attention has been given to whether near gender parity in higher-education participation translates into comparable representation among academic staff and senior academic positions. The present study addresses this gap by examining gendered inequalities across the higher-education pipeline in Uttarakhand, with particular attention to participation, career progression, structural barriers, and institutional practices. It therefore shifts the focus from the question of whether women enter higher education to whether they are able to progress equally within the academic system.

3. Research Objectives

1. To examine the gender-wise participation and representation of men and women in higher education in Uttarakhand.
2. To analyse gender disparities in academic career progression, particularly across teaching positions and senior academic levels.
3. To identify the major structural and institutional factors contributing to gender inequalities in higher education and academic careers in Uttarakhand.

4. Research Methodology

Research Design

The study adopts a descriptive and analytical research design to examine gender inequalities in higher education in Uttarakhand. The descriptive component presents the extent of male and female participation at different stages of higher education, while the analytical component compares women's representation across academic and career stages to identify patterns of gender disparity. The study is based entirely on secondary data and does not involve primary-level survey or interview data.

Sources of Data

The study uses secondary data collected from reliable official and institutional sources. The principal source is the All India Survey on Higher Education (AISHE) published by the Ministry of Education, Government of India. AISHE provides information on student enrolment, gender distribution, teachers, academic positions and other characteristics of higher education institutions. Additional information may be obtained from the Periodic Labour Force Survey (PLFS), Ministry of Statistics and Programme Implementation, University Grants Commission (UGC), Uttarakhand Higher Education Department, Directorate of Economics and Statistics, Government of Uttarakhand, NITI Aayog reports, and relevant university reports and policy documents.

Study Period

The study will primarily examine the period 2014–15 to 2021–22, subject to the availability and comparability of data across years. The period is selected to capture changes in women's participation and representation over time rather than relying only on a single-year observation.

Variables and Indicators

The major indicators used for analysis include male and female enrolment, female share of total enrolment, Gender Parity Index (GPI), gender-wise representation among teachers, representation at different academic ranks, and women's presence in senior academic positions. Where comparable information is available, disciplinary and institutional differences will also be considered. These indicators allow the study to examine whether gender equality observed at the entry level continues through subsequent stages of academic careers.

Data Analysis

The collected data will be systematically tabulated and analysed using percentages, ratios, Gender Parity Index, growth rates and comparative analysis. Female representation at different stages of the academic pipeline will be compared to identify possible patterns of attrition. For example, the proportion of women among students can be compared with their representation among teachers, associate professors and professors. Such comparisons will help determine whether women's representation decreases as academic seniority increases.

The Gender Parity Index will be used to assess relative participation of women and men. A value close to 1 indicates broad gender parity, while values below or above 1 indicate relatively lower or higher female participation, respectively. Trend analysis will further be used to identify whether gender disparities have narrowed or persisted during the study period.

Analysis of Structural and Institutional Factors

The study will supplement quantitative analysis with a qualitative review of secondary institutional and policy documents. Relevant university statutes, recruitment and promotion regulations, gender-related policies, maternity and childcare provisions, Internal Complaints Committee (ICC) frameworks, women's cells, institutional annual reports and other publicly available documents will be reviewed wherever accessible. These materials will be examined to understand how institutional practices, career structures, family-related constraints, mobility requirements, mentoring opportunities and promotion mechanisms may influence women's academic progression.

Conceptual Approach

The analysis is guided primarily by the Feminist Institutionalism perspective, which emphasizes that formal rules and informal institutional practices can reproduce gender inequalities even when policies appear gender-neutral. The study also draws on the Human Capital perspective to examine whether women's increasing educational participation translates into comparable professional outcomes, and the Leaky Pipeline/Glass Ceiling perspective to interpret declining female representation at successive stages of academic careers.

Alignment of Objectives and Methodology

	Objective	Major Indicators	Method of Analysis
1	Examine gender-wise participation in higher education	Enrolment, female share, GPI	Percentage, ratio and trend analysis
2	Analyse gender disparities in academic career progression	Teachers, associate professors, professors, senior positions	Comparative analysis and academic pipeline analysis
3	Identify structural and institutional factors	Recruitment/promotion rules, mentoring, childcare, mobility, gender policies and institutional provisions	

5. Data Analysis and Interpretation

Objective 1: To examine the gender-wise participation and representation of men and women in higher education in Uttarakhand

Gender-wise enrolment is the first indicator for assessing whether women have achieved meaningful access to higher education in Uttarakhand. The analysis considers total enrolment, male and female shares, Gender Parity Index (GPI), and Gross Enrolment Ratio (GER).

Table 1: Gender-wise Enrolment in Higher Education in Uttarakhand

Academic Year	Male Enrolment	Female Enrolment	Total Enrolment	Male Share (%)	Female Share (%)
2017-18	224,608	212,543	437,150	51.38	48.62
2018-19	241,083	227,172	468,255	51.49	48.51
2019-20	248,893	244,386	493,279	50.46	49.54
2020-21	304,850	315,301	620,151	49.16	50.84
2021-22	286,149	281,555	567,704	50.40	49.60

Source: AISHE 2021-22, Ministry of Education, Government of India

The data indicate a substantial level of gender balance in higher-education participation in Uttarakhand. Female enrolment increased from 212,543 students in 2017–18 to 281,555 in 2021–22, representing an increase of approximately 32.5%. Male enrolment increased from 224,608 to 286,149 during the same period, or approximately 27.4%. Thus, although male enrolment remained marginally higher in 2021–22, female enrolment grew somewhat faster over the period.

The female share of total enrolment increased from 48.62% in 2017–18 to 49.60% in 2021–22. More importantly, women constituted more than half of total enrolment in 2020–21, when their share reached 50.84%. The subsequent decline to 49.60% in 2021–22 does not represent a major reversal; rather, it indicates that participation remained close to parity.

The Gender Parity Index provides further evidence of relatively strong female participation. AISHE 2021–22 reports a GPI of approximately 1.09 for Uttarakhand, compared with 1.01 for India. A value above one indicates that female participation relative to the relevant male population is comparatively strong. The state therefore performs better than the national average on this access-oriented measure. (Scribd)

The GER also provides an important indication of participation among the population aged 18–23 years. Uttarakhand recorded an overall higher-education GER of 41.8% in 2021–22, substantially above the all-India GER of 28.4%. The official AISHE report identifies Uttarakhand among the states with relatively high levels of higher-education participation. (Education Government of India)

Interpretation of Objective 1

The analysis clearly suggests that women in Uttarakhand have achieved substantial access to higher education. Female students represented almost half of all higher-education enrolment in 2021–22, while the state's GPI was above the national level. Therefore, the principal gender problem in Uttarakhand cannot be described simply as a lack of women's access to higher education.

However, access parity should not automatically be interpreted as complete gender equality. Enrolment represents the entry stage of the higher-education pipeline.

The more important question is whether women continue to be represented at comparable levels when they move from students to teachers and subsequently to senior academic positions. This issue is examined under Objective 2.

Objective 2: To analyse gender disparities in academic career progression, particularly across teaching positions and senior academic levels

The second objective examines whether the near-parity observed among students continues into academic employment and career progression. For this purpose, the analysis compares women's representation among all teachers, associate professors/readers, and professors/equivalent.

Table 2: Gender-wise Representation of Teachers in Uttarakhand, 2021–22

Academic Position	Male	Female	Total	Female Share (%)
All Teachers	11,718	7,800	19,518	39.96
Associate Professor/Reader	1,370	748	2,118	35.32
Professor & Equivalent	1,893	673	2,566	26.23

Source: AISHE 2021–22, Table 21 and Table 22, Ministry of Education, Government of India. (Scribd)

The results reveal a clear difference between educational participation and academic employment. While women constituted 49.60% of higher-education students, they accounted for only 39.96% of teachers. Thus, women's representation among teachers was approximately 9.6 percentage points lower than their representation among students.

The disparity becomes more pronounced at higher academic ranks. Women constituted 35.32% of associate professors/readers, compared with 39.96% among all teachers. At the professor/equivalent level, women's representation declined further to only 26.23%.

This pattern can be represented as follows:

Female students: 49.60% → Female teachers: 39.96% → Female associate professors: 35.32% → Female professors: 26.23%

The difference between female student representation and female representation among professors is particularly significant. Women account for almost half of the student population but only about one-fourth of professors/equivalent.

The decline from 49.60% at the student stage to 26.23% at the professor level represents a reduction of approximately 23.4 percentage points.

The data therefore indicate the presence of a gendered academic pipeline. Women are entering higher education in substantial numbers, but their representation becomes progressively smaller as academic seniority increases.

The associate-professor stage provides an intermediate indication of this process. Female representation decreases from 39.96% among all teachers to 35.32% among associate professors and then to 26.23% among professors. This suggests that the gender disparity is not restricted to the transition from education to employment; it continues within the academic career itself.

Interpretation of Objective 2

The findings provide strong descriptive evidence of a leaky academic pipeline in Uttarakhand. The state has achieved relatively high female participation at the student level, but this advantage is not carried forward proportionately into academic employment and senior positions.

The result is particularly important because it demonstrates that gender equality in higher education cannot be assessed only through enrolment statistics. If women constitute approximately half of students but only around one-quarter of professors, then substantial gender inequality exists in career progression.

The pattern is also consistent with the broader literature on the academic "leaky pipeline" and glass-ceiling effects, where women's representation tends to decline at successive stages of professional advancement. However, the present secondary data establish the pattern of disparity rather than its individual-level causes. The possible structural and institutional explanations are therefore examined through Objective 3.

Objective 3: To identify the major structural and institutional factors contributing to gender inequalities in higher education and academic careers in Uttarakhand

The third objective differs from the first two because structural and institutional barriers cannot be adequately measured through enrolment figures alone.

Therefore, the analysis combines the quantitative findings above with a qualitative review of institutional and policy-related evidence.

The literature identifies several factors that can affect women's academic progression, including family and care responsibilities, geographical mobility, professional networks, mentoring, research opportunities, recruitment and promotion procedures, and access to leadership positions. Mayya et al. (2021), for example, identified family responsibilities, time constraints, mobility, professional networks and lack of mentoring as relevant barriers for women faculty seeking administrative roles. Similarly, van den Brink and Benschop (2012) demonstrate how formal and informal institutional processes can reproduce gender inequality in academic careers.

For Uttarakhand, geographical considerations are particularly relevant because the state's higher-education system operates across both relatively urban centres and geographically dispersed hill regions. Academic careers may require relocation, commuting, participation in professional networks, conference attendance and research collaboration. Such requirements can interact with family responsibilities and therefore have gendered consequences.

The quantitative evidence strengthens the relevance of these institutional explanations. If women's representation were broadly equal throughout the academic pipeline, the issue would primarily concern access. However, the observed decline from 49.60% female students to 39.96% female teachers and finally to 26.23% female professors suggests that barriers may become increasingly important at stages involving recruitment, retention, promotion, research productivity and institutional leadership.

Table 3: Structural and Institutional Factors and Their Possible Career Implications

Factor	Possible effect on women's academic careers	Relevance to observed inequality
Family and care responsibilities	Interruptions or reduced time for research and professional activities	May affect progression to senior positions
Geographical mobility	Difficulty in relocation, commuting and accepting distant positions	Particularly relevant in geographically dispersed institutions
Professional networks	Unequal access to academic collaborations and informal networks	May influence research and promotion opportunities

Mentoring	Limited access to senior academic guidance	Can affect career planning and leadership progression
Research opportunities	Differences in time, resources and institutional support	Important for promotion and senior academic advancement
Recruitment and promotion practices	Formal and informal criteria may produce unequal outcomes	Potential influence on progression to senior ranks
Leadership opportunities	Lower participation in administrative decision-making	May restrict career visibility and advancement
Work-life support	Limited childcare or flexible arrangements can increase career pressures	May contribute to career interruptions

The institutional interpretation should nevertheless be treated cautiously. The available secondary data demonstrate gender differences in representation, but they do not by themselves establish that any single factor—such as family responsibilities, mobility or promotion procedures—is the direct cause of the observed disparity. Establishing causal relationships would require primary data from women faculty, institutional administrators and other stakeholders.

Interpretation of Objective 3

The evidence indicates that the gender gap in Uttarakhand's higher education system is increasingly a career-progression and institutional issue rather than simply an access issue. The near parity in student participation demonstrates considerable progress in educational access, while the lower representation of women among teachers and especially professors points towards barriers operating after entry into higher education.

The findings therefore support the need to examine institutional practices beyond enrolment policies. Recruitment, promotion, mentoring, research support, work-life arrangements, career continuity, geographical mobility and women's access to leadership opportunities require greater attention. Institutional gender audits and systematic monitoring of women's progression across academic ranks could help identify where the largest losses occur.

Overall Interpretation of the Three Objectives

The combined analysis produces a clear pattern. Objective 1 demonstrates relatively strong gender participation in higher education; Objective 2 reveals substantial gender disparity in academic career progression;

and Objective 3 indicates that the explanation must extend beyond access to structural and institutional conditions.

The central finding can therefore be summarized through the following academic pipeline:

Higher-Education Participation → Academic Employment → Associate Professor → Professor

49.60% → 39.96% → 35.32% → 26.23%

This pattern demonstrates that access equality does not necessarily result in career equality. Uttarakhand appears to have made considerable progress in bringing women into higher education, but the representation of women decreases progressively at higher stages of the academic hierarchy. Consequently, policies focused only on increasing female enrolment are unlikely to be sufficient for achieving substantive gender equality. Greater emphasis is required on retention, career progression, promotion, research opportunities, mentoring, work-life support and institutional leadership.

The findings are consistent with the central argument of the study: gender inequality in higher education should be assessed across the complete academic pipeline rather than at the point of entry alone.

Important methodological note: Objective 3 is deliberately presented as a secondary-document/interpretive analysis, not as a statistical causal test. If you want this paper to be stronger for a Scopus-oriented journal, the next step should be to create a separate institutional-practices dataset for selected Uttarakhand universities—for example, recruitment/promotion rules, maternity/childcare provisions, ICCs, women's cells, mentoring and leadership provisions—and then analyse those systematically rather than merely discussing them.

Gender-wise higher-education enrolment in Uttarakhand

Male and female enrolment from 2017–18 to 2021–22.

Year	Male	Female
2017–18	224,608	212,543
2018–19	241,083	227,172
2019–20	248,893	244,386
2020–21	304,850	315,301
2021–22	286,149	281,555

Declining female representation across the academic pipeline

Female representation falls progressively from student participation to senior academic positions in Uttarakhand, 2021–22.

Stage	Female Share
Students	49.6
Teachers	39.96
Associate professors	35.32
stage	femaleShare

Based on the three objectives and the data analysis developed above, the Findings and Suggestions can be presented concisely and directly in line with the empirical results.

6. Findings of the Study

The study examined gendered inequalities in higher education in Uttarakhand by analysing gender-wise participation, academic career progression, and structural and institutional factors using secondary data. The major findings are as follows:

1. Near gender parity in higher-education participation: The analysis indicates that women have achieved substantial participation in higher education in Uttarakhand. In 2021–22, women constituted approximately 49.60% of total higher-education enrolment, indicating that the gender gap at the entry stage is relatively narrow.
2. Relatively favourable gender parity: Uttarakhand recorded a Gender Parity Index of approximately 1.09, higher than the national level of approximately 1.01. This indicates that women's participation relative to men is comparatively favourable in the state.
3. Gender disparity emerges at the employment stage: Despite near parity among students, women represented only about 39.96% of teachers in higher education. This indicates that the transition from higher-education participation to academic employment is associated with a substantial reduction in female representation.
4. Female representation declines with academic seniority: Women's representation decreased from approximately 39.96% among all teachers to 35.32% among associate professors/readers and 26.23% among professors/equivalent. This provides clear descriptive evidence of a gendered academic pipeline.
5. The largest disparity occurs at the professor level:

The difference between female student representation and female professor representation is approximately 23 percentage points. Thus, the principal gender inequality is not necessarily women's entry into higher education but their progression towards senior academic positions.

6. Access equality does not translate into career equality: The findings demonstrate that high female participation in higher education does not automatically result in equivalent representation in academic employment, promotion and senior positions.

7. Structural and institutional conditions remain important: The literature and institutional evidence indicate that family responsibilities, geographical mobility, mentoring, professional networks, research opportunities, promotion practices and access to leadership opportunities can influence women's academic career progression.

8. Gender inequality is therefore multidimensional: The study establishes that gender inequality in Uttarakhand's higher-education system should not be evaluated only through enrolment. Career progression, institutional participation and representation at senior levels are equally important dimensions of gender equality.

Overall, the study finds a clear transition from relative gender parity at the educational-entry stage to increasing gender disparity at successive stages of the academic career. The evidence supports the existence of a leaky academic pipeline in Uttarakhand and highlights the need to shift policy attention from women's access to their long-term academic progression and leadership.

7. Suggestions and Policy Recommendations

The findings indicate that Uttarakhand has made considerable progress in women's participation in higher education, but significant inequalities remain in academic employment and career progression. Based on these findings, the following suggestions are proposed.

1. Shift from Access to Career Equality

Higher-education policies should move beyond measuring women's enrolment and focus equally on retention, recruitment, promotion and leadership. Institutions should regularly monitor women's representation at each stage of the academic career pipeline.

2. Introduce Institutional Gender Audits

Universities and colleges should conduct periodic gender audits covering recruitment, promotion, workload allocation, research opportunities, administrative responsibilities, professional development and leadership positions. Such audits can identify specific points at which women's representation declines.

3. Strengthen Mentoring and Career Development

Structured mentoring programmes should connect early-career women academics with experienced faculty members. Mentoring can support research development, publication, grant applications, networking, academic leadership and career planning.

4. Improve Research and Professional Support

Institutions should ensure equitable access to research funding, conferences, training, research collaborations and professional development programmes. Special attention should be given to supporting women whose research careers have been interrupted because of family or caregiving responsibilities.

5. Strengthen Work–Life Support

Universities should provide effective childcare facilities, maternity-related support, flexible work arrangements where feasible, and mechanisms that allow academics to resume their research and teaching careers after career interruptions. Such measures can reduce the career penalties associated with caregiving responsibilities.

6. Ensure Transparency in Recruitment and Promotion

Recruitment and promotion procedures should be transparent, clearly documented and based on consistent and gender-neutral criteria. Institutions should periodically examine promotion outcomes by gender to identify unexplained disparities in career advancement.

7. Address Geographical and Mobility Barriers

Given Uttarakhand's distinctive geographical context, institutions should consider the difficulties associated with long-distance commuting, relocation and geographically dispersed campuses.

Where feasible, flexible scheduling, appropriate accommodation and institutional support can reduce mobility-related barriers.

8. Increase Women's Representation in Leadership

Universities should create structured opportunities for women faculty to participate in departmental committees, academic administration and institutional decision-making. Leadership-development programmes can help prepare women for positions such as heads of departments, deans, directors and other senior administrative roles.

9. Develop a Gender-Based Academic Progression Database

The state should develop a systematic database recording female and male representation at different academic ranks, including recruitment, promotion, attrition and leadership. Such longitudinal data would allow institutions to identify whether gender gaps are narrowing or widening over time.

10. Develop a Gender Equality in Higher Education Index for Uttarakhand

A state-level Gender Equality in Higher Education Index could be developed using indicators such as enrolment, faculty representation, promotion, senior academic positions, leadership, research participation and institutional support. Such an index would provide a more comprehensive assessment than enrolment statistics alone.

11. Strengthen Gender-Sensitive Institutional Culture

Gender equality should be incorporated into institutional planning and governance rather than treated only as a welfare issue. Sensitisation programmes for faculty and administrators, effective grievance mechanisms and regular monitoring of gender-related concerns can contribute to a more inclusive academic environment.

12. Focus on Evidence-Based Policy

Finally, future policy interventions should be based on systematic institutional evidence. Quantitative data should be complemented with faculty-level studies, institutional case studies and qualitative research to understand why women's representation declines across academic career stages.

The most important policy implication of the study is that **Uttarakhand should move from a "women's access to higher education" approach towards a "women's progression through higher education" approach.** Near parity in student enrolment represents an important achievement, but genuine gender equality will require women to have comparable opportunities for academic employment, promotion, research, leadership and institutional decision-making.

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