

Research Paper



Breaking barriers: exploring gender and sector disparities in professional development and career advancement

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ABSTRACT

The study examines the differences in professional development and career progression between men and women in Pakistan's academic field. We selected 150 participants for our study, and 90 of them were female, while the other 60 were male. We relied on descriptive statistics and t-tests to evaluate the number of people participating in PD in the public versus the private sector. Although PD was involved in a similar manner across both sectors, women were significantly less likely to be involved in private institutions. There was a significantly greater proportion of male faculty involved in professional development (PD) than women. People from private institutions were more optimistic about the chances for career advancement. The results show that the differences primarily arise from institutional practices and sociocultural factors. The analysis highlights how faculty development is influenced by the institution's systems and cultural norms. They make it clear that policies should include gender issues and actions to give equal opportunities for professional development and promote inclusive career growth in universities everywhere.

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1. INTRODUCTION

For faculty to advance in their careers, they must receive professional development. Nevertheless, there are still gaps in PD participation for women in certain areas, which do not give them equal chances to improve their careers. Across institutions, red tape in the public sector, as well as elitist approaches in private universities, continue to shape the paths that faculty follow in their careers [1].

Institutional Theory provides a framework for analysing how specific rules contribute to maintaining differences in access to professional development (PD). The Trust in Technology framework positions AI-led professional development as easily deployable solutions to overcome challenges faced by different sectors and genders. Using both theories provides a more comprehensive view of the challenges and offers flexible technology steps to enhance faculty development laws. We can use Institutional Theory to explain why society's members differ better.

Due to administrative obstacles, limited funding sources, and stringent promotion plans, professional development (PD) access in public institutions is not always available to staff who wish to develop professionally [2]. On the other hand, private institutions attempt to engage employees in professional development through competition but often lack clear strategies to ensure the inclusion of women [3]. These particular regulations often influence the number of women and men who become involved in PD programs.

Along with other challenges, gender differences make it more challenging for patients to get PD. Women in academia often find that cultural beliefs impact their academic careers, particularly when it comes to balancing family responsibilities and the lack of available mentors [4]. Research shows that in higher education, women primarily control their involvement with PD and give priority to their family life instead of pursuing career advancement due to biases institutions show in selecting leaders and promoting people in their careers [5].

Trust in Technology presents AI-driven professional development (PD) programs as solutions that effectively address large-scale interventions in reducing gender-based barriers [6]. AI-supported education enables teachers to learn more easily, especially female ones who have multiple personal needs and responsibilities.

To explore these concerns, this study examines sectoral and gender disparities in PD participation through an empirical lens. Integrating Institutional Theory and Trust in Technology aims to provide actionable insights for fostering inclusive PD programs that facilitate equitable career advancement.

Research Questions and Hypotheses

This study seeks to answer the following research questions:

- RQ1: What are the differences in professional development participation between public and private sector employees?
- RQ2: How do gender differences affect participation in professional development programs in both public and private sectors?

Based on these Questions, the Study Tests the Following Hypotheses:

- H1: There is a significant difference in professional development (PD) participation between employees in the public and private sectors.
- H2: Gender significantly influences professional development participation in both public and private sectors.
- H3: The likelihood of career advancement is significantly higher in the private sector compared to the public sector.
- H4: Gender-based disparities in career advancement likelihood exist, with men being more likely to advance in both sectors.

This study contributes to the ongoing discourse on faculty development by bridging theoretical insights with empirical findings. Unlike previous research, which primarily examines institutional or gendered barriers in isolation, this study integrates both perspectives to propose AI-driven PD solutions. It highlights the intersection of sectoral policies and gender disparities, demonstrating how technology-enhanced PD initiatives can be scalable solutions for equitable career progression in academia.

2. LITERATURE REVIEW

Professional development (PD) remains a cornerstone of faculty career progression, yet gender inequities persist due to sociocultural expectations and institutional biases. Women in academic fields may progress less in their careers as they have to deal with few mentors and responsibilities at home that prevent them from joining in PD events [4]. Certain studies have found that these hidden biases in the workplace have a negative impact on the promotions of women faculty [7].

Being able to go under a mentor's guidance opens many doors in career development. The researchers [8] found that male staff meet with experienced faculty for informal advice, while women are mostly left out of important leadership networks. Bol et al. [9] discovered that gendered stereotypes have an impact on giving faculty promotions, making it more difficult for women to move up. Such disparities result in less progress, meaning that women are not likely to reach top-level academic posts [10].

Faculty interacts with PD activities due to the leadership of the institutional sector. Restrictions on PD activities in public universities are usually caused by strict methods for funding, response to regulatory policies from higher levels, and rigid ways to promote staff members [2]. In [11], Popova et al. noticed that faculty at public universities have to go through many administrative processes before they can access career-enhancing programs.

At the same time, merit-based private schools often fail to have gender-sensitive policies, which means not all are able to use the same leadership training opportunities [3]. Experts suggest that since mentoring structures in private-sector universities are not formalized, unequal progress remains for female employees [12]. Adegbite [13] showed that the influence of different areas overseeing education has significance for career growth. They pointed out that the private sector makes employee training easier for many, yet it does not address the gender imbalance when it comes to leadership.

With AI added to professional development for faculty, the sectoral and gender gaps in career promotion are being addressed [6]. A study by Teachflow.AI [14] concluded that programs that use AI help educators by customizing their learning paths and giving them flexibility in participating. Tammets and Ley [15] continued to look into AI-based PD, urging the use of integrated learning models to make PD available to more educators.

Empirical research highlights that AI-assisted PD programs increase faculty engagement, particularly among female educators managing work-life balance [16]. [17] compared traditional vs AI-driven training models, revealing that faculty participation rates significantly improved with AI-adaptive interventions. However, [18] noted that institutional adoption of AI-based PD programs remains uneven, as trust in AI learning varies across gender lines, with male faculty displaying higher confidence in digital learning platforms than female faculty [19].

The literature underscores the urgent need for targeted policy interventions to mitigate sectoral and gender disparities in PD participation. Institutional reforms should prioritize structured mentorship programs, gender-sensitive promotional pathways, and AI-assisted faculty training models to foster equitable career progression [20]. Without these interventions, higher education institutions risk reinforcing structural exclusions that limit female faculty representation in academic leadership roles [21].

Theoretical Framework

The results were drawn from papers that applied institutional Theory and trust in Technology to analyse gaps between men and women in development and advancement. Regardless of whether they are public or private, every institution is regulated by laws and standards that determine whether its staff can access professional development. Many public universities face barriers due to bureaucratic constraints, often resulting from strict timetables and financial constraints. However, private institutions often focus on meritocratic participation in professional development and may

inadvertently support gender inequality. Different aspects of faculty life shape the opportunities for professional development and influence their involvement in development programs. Past research has shown that how schools are governed matters greatly for the opportunities young professionals have, particularly regarding gender equality in higher education.

This approach suggests that artificial intelligence can help alleviate the obstacles people face in accessing professional development opportunities. Utilising digital tools in faculty training facilitates a more effective learning environment, as it helps overcome the challenges associated with traditional school structures. Even so, faculty has different.

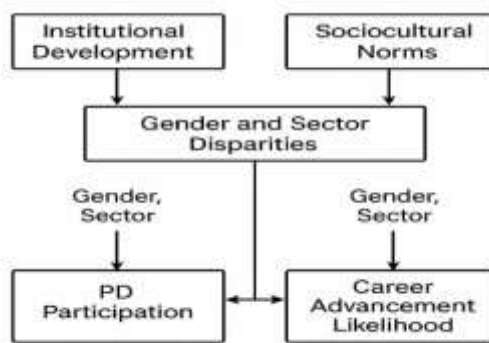


Figure 1. Conceptual Framework of Gender and Sectoral Disparities in Faculty Development

As illustrated in Figure 1, the conceptual framework integrates institutional theory and trust in technology to explain how organizational structures and digital interventions collectively shape gendered access to faculty development opportunities.

3. METHODOLOGY

3.1 Research Design

By employing a quantitative, comparative approach, this study aimed to identify the differences between men and women, as well as between various sectors, in terms of how faculty members are promoted and develop their careers in Pakistani institutions. Applying the comparative approach made it possible to see differences in male and female faculty at public and private colleges. Depending on numbers and statistics helped guarantee fairness and certainty in observing main variables.

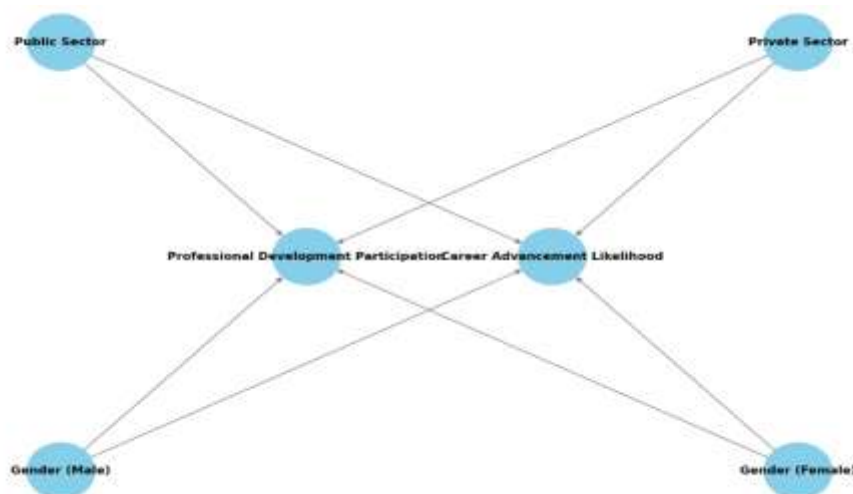


Figure 2. Variable Relationships in Sector and Gender Inequity in Career Advancement

Figure 2 illustrates the way gender and where people work affects their chances of career advancement in any sector. It highlights that the disparity in career advancement opportunities due to gender differs between public and private companies. Women tend to encounter greater challenges when seeking advancement, which varies across sectors due to differences in company cultures and rules. Based on this, we can conclude that addressing career inequity requires considering both gender and sector-specific factors

3.2 Sample and Participants

A purposive sampling method enabled the collection of feedback from 150 faculty members across ten educational institutions in Pakistan, encompassing both urban and semi-urban areas. All the samples were evenly selected from both private and public organisations and were ordered by gender to facilitate the easy comparison of sectors and genders. The researchers used purposive sampling to select teachers who had academic duties, which allowed for a proper analysis of how the institution affects professional development opportunities. Since self-reported information may have flaws, experts were consulted, and other statistics were checked to improve the study's accuracy and deal with common flaws in perceptual data.

3.3 Inclusion Criteria

1. Those with at least three years of teaching experience at colleges and universities.
2. Being involved in courses or committees. The researcher chose stratified sampling to guarantee that each academic rank was fairly reflected and comparable.

This method provided insights into how professional development access and career advancement perceptions vary across different levels of academic hierarchy.

3.4 Data Collection Tool

This study utilized a structured questionnaire to examine faculty participation in professional development programs and perceptions of career advancement. The questionnaire contained 25 closed-ended items using a five-point Likert scale, ranging from strongly disagree to strongly agree, ensuring consistency in measuring respondent perspectives.

3.5 Instrument Development and Validation

The questionnaire contained several demographic questions to measure variables such as gender, the part of the education sector a person is in, their academic rank, years of teaching experience, and the frequency of participation in professional courses. It was developed from existing, proven scales and reviewed by three education and faculty development specialists to enhance its reliability. Ten faculty members from institutions not included in the final group participated in the pilot study to verify the clarity and functionality of the instrument. The study team made slight adjustments to items and their layout based on participant feedback, ensuring the items aligned with the study's goals.

3.6 Data Analysis

Collected data were coded and analyzed using SPSS version 26. Descriptive statistics were computed to summarise responses, including mean, standard deviation, and frequency distributions. Inferential statistics, including independent-sample t-tests and ANOVA, assessed significant differences between groups based on gender and sector. Interaction effects were explored where applicable. Reliability testing yielded a Cronbach's alpha of 0.87, indicating high internal consistency of the questionnaire items. The dataset was screened for missing values and outliers, and assumptions for parametric tests were checked to ensure the validity of statistical interpretations.

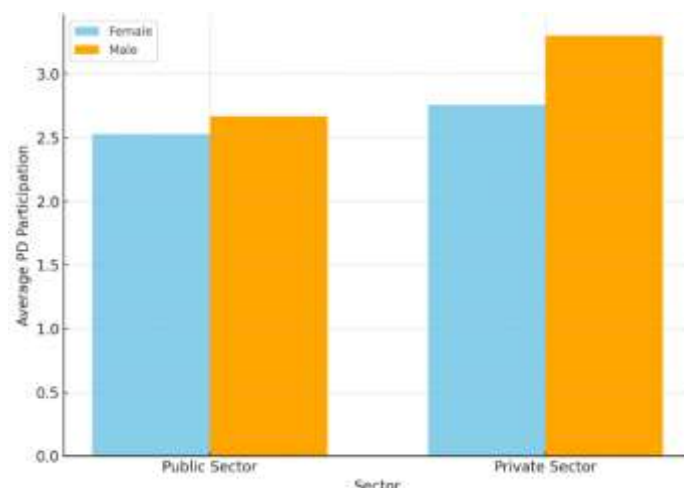
Table 1. Descriptive Statistics for Professional Development Participation

University Sector	Demographic Information	Count	Mean	Std Dev	Min	25%	50%	75%	Max
Private Sector	Female	41	2.76	1.45	1	1	3	4	5
	Male	27	3.30	1.38	1	3	3	4	5
Public Sector	Female	49	2.53	1.44	1	1	2	4	5
	Male	33	2.67	1.22	1	2	3	4	5

As shown in [Table 1](#) provides a detailed overview of Professional Development Participation by gender and sector. For each group (female or male, in public or private sectors), we show the count, mean, standard deviation (STD Dev), and the percentiles (25%, 50%, 75%) of the scores, along with the minimum (Min) and maximum (Max) values.

Notably, the mean for Private-Sector Males is higher (3.30) than for Private-Sector Females (2.76), suggesting more frequent participation in professional development activities among male employees in the private sector.

The distribution of professional development participation is influenced by sectoral and gender factors. [Figure 3](#) visualizes these trends, highlighting variations between male and female faculty across public and private universities.

**Figure 3.** Distribution of Professional Development Participation by Gender and Sector

As shown in [Figure 3](#) the relationship between the sector (public vs private) and gender (male vs female) concerning professional development participation. It highlights any variations in participation between gender groups in both public and private sector universities.

Table 2. Descriptive Statistics for Career Advancement Likelihood

University Sector	Demographic Information	Count	Mean	Std Dev	Min	25%	50%	75%	Max
Private Sector	Female	41	2.75	1.45	1	1	3	4	5
	Male	27	3.30	1.38	1	3	3	4	5
Public Sector	Female	49	2.53	1.44	1	1	2	4	5
	Male	33	2.67	1.22	1	2	3	4	5

Similar to [Table 1](#) and [Table 2](#) presents descriptive statistics for Career Advancement Likelihood by sector and gender.

Again, Private-Sector Males show a higher mean (3.30) than private-sector Females (2.75), reflecting a higher perception of career advancement opportunities. A similar trend is observed in the

Public Sector, where males have slightly higher career advancement likelihood scores than females. Career advancement perceptions differ across sectors, with gender playing a notable role. Figure 4 illustrates how male and female faculties perceive opportunities within public and private institutions.

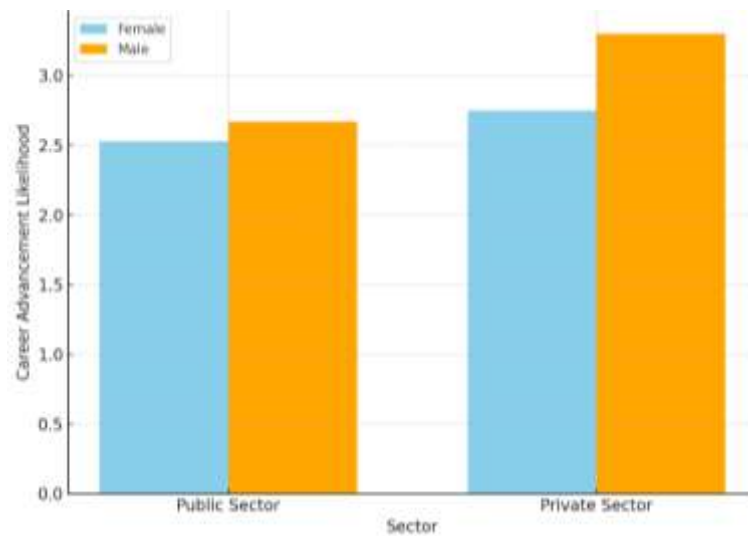


Figure 4. Perceived Career Advancement Opportunities by Sector and Gender

As shown in Figure 4, male faculty in both public and private sectors reported higher perceived opportunities for career advancement compared to their female counterparts. This trend was especially pronounced in private institutions, indicating a persistent gender-based gap in career mobility expectations.

Table 3. T-Test for professional Development

Comparison	T-Statistic	P-Value	Interpretation
Participation (Public vs Private)	0.47	0.64	There is no significant difference between sectors.
Career Advancement (Public vs Private)	-1.69	0.09	Marginally significant; borderline difference.
Gender in the Public Sector (Participation)	-0.26	0.80	There is no significant gender difference in participation.
Gender in Private Sector (Participation)	-2.66	0.01	Significant gender difference in participation.

As shown in Table 3 analysis reveals that sectoral affiliation alone does not significantly impact professional development participation ($p = 0.64$). However, gender disparities within private institutions are statistically significant ($p = 0.01$), reinforcing the need for structured gender-sensitive interventions. These findings align with [13], who observed similar trends in private-sector career mobility. Given these disparities, future studies should examine mentorship accessibility and institutional funding differences as key determinants of participation

Career Advancement (Public vs Private): The t-test for career advancement likelihood between the Public and Private sectors resulted in a t-statistic of -1.69 and a p-value of 0.09, which is marginally significant ($p \approx 0.09$). This suggests a borderline difference, indicating that while the sectors may differ slightly in perceived career advancement, the difference is not definitively significant at the 0.05 level.

Gender in Public Sector (Participation): The t-test for professional development participation in the Public Sector between Females and Males yielded a t-statistic of -0.26 and a p-value of 0.80, greater than 0.05, indicating no significant gender difference in participation.

Gender in Private Sector (Participation): The t-test for professional development participation in the Private Sector between Females and Males yielded a t-statistic of -2.66 and a p-value of 0.01, which is statistically significant ($p < 0.05$), indicating that gender significantly affects participation in professional development in the Private Sector.

4. RESULTS AND DISCUSSION

4.1 Interpretation of Results

4.1.1 Professional Development Participation

The analysis indicates no statistically significant difference in professional development participation between the public and private sectors, with a p-value of 0.64. This suggests that sector affiliation alone does not strongly influence professional development engagement, implying that employees across both sectors experience similar opportunities or motivations for participating in professional growth programs.

However, gender disparities in professional development participation are more pronounced in the private sector, where males engage in professional development programs at a significantly higher rate than females, as indicated by a p-value of 0.01. This suggests that cultural and organizational factors within private institutions may contribute to unequal access, reinforcing informal barriers that limit female employees' participation in professional development activities.

4.1.2 Career Advancement Likelihood

A marginal sectoral difference was observed in career advancement likelihood, with private-sector employees perceiving slightly better opportunities than their public-sector counterparts, yielding a p-value of 0.09. Although this result does not reach the conventional threshold for statistical significance, it indicates a trend suggesting that career mobility is perceived to be greater in the private sector.

Since this finding does not conclusively demonstrate sector-based disparities, further research or an expanded sample size may be necessary to assess whether sectoral differences in career advancement are systematic or institution-specific rather than incidental.

4.1.3 Gender Differences in Professional Development Participation

Within the public sector, gender does not significantly impact professional development participation, with a p-value of 0.80. This suggests that male and female employees exhibit similar engagement levels in professional development activities, implying that institutional structures in public universities may facilitate gender-neutral access to professional development programs through standardized policies and centralized funding mechanisms.

In contrast, private sector institutions show statistically significant gender disparities in professional development participation, where males engage more frequently than females, as reflected in the p-value of 0.01. This highlights the presence of gender inequalities in professional development accessibility within private organizations, potentially restricting career advancement opportunities for female employees compared to their male counterparts.

4.1.4 Key Insights and Implications

The absence of a significant difference in professional development participation across sectors suggests that institutional challenges are not necessarily sector-specific. Instead, both public and private institutions must address professional development accessibility collectively.

Gender disparities in private sector professional development participation indicate a need for gender-sensitive policy interventions, such as mentorship programs, flexible schedules, and equitable selection criteria.

Although private sector employees perceive slightly better career mobility, the lack of strong statistical significance suggests that additional institutional factors beyond sector affiliation may influence career progression.

Public sector gender neutrality in professional development participation may reflect an overall limitation in access rather than accurate equity, requiring further investigation into structural barriers.

The study's results provide valuable insights into the differences in development and career progression for women and men in academia. When examining the entirety of professional development activities, both sectors are similar; however, there are significant differences between male and female faculty in private institutions, where the former are more involved. Additionally, people often consider career advancement opportunities to be better at private-sector colleges, possibly due to the culture and policies in place.

4.2 Sectoral Differences in Professional Development Participation

To determine whether a faculty member's institution influenced their engagement, the level of participation in professional development was examined across different sectors. There was no significant difference between sectors, indicating that both the public and private sectors face challenges in accessing resources. This aligns with previous research, which suggests that bureaucratic challenges in public universities hinder employees' career advancement. Private institutions, despite offering merit-based jobs, often lack precise mechanisms for promoting inclusion [3]. This is also the case in many countries, where regulations prevent teachers from advancing professionally through training programs. [12] studied this topic again and learned that faculty from private institutions noticed more career promotion options based on their skills.

4.3 Gender-Based Disparities in Professional Development

It was found that male workers in the private sector were more likely than female workers to take part in professional development programs. Meanwhile, no differences based on gender were observed in the public sector, suggesting that implementing specific policies makes participation equal for all. Research has found that women working in universities often face bias, particularly in terms of receiving mentorship and advancing in leadership roles [7]. The FACT-GÉN tool suggests that the presence of institutional biases has a significant impact on the careers of female faculty. Also, [9] surveyed Pakistani university teaching staff and concluded that gender discrimination is present in making choices and access to advancement.

It is further noted that female professors often choose not to engage in professional development due to the demands of taking care of their families and balancing their work and family responsibilities. In their study, [5] showed that women are less likely to focus on leadership education because their duties at home detract from their ability to advance in their careers. Findings from world universities suggest that there are barriers for women in their academic and professional careers due to societal and educational factors.

4.4 Career Advancement and Sectoral Differences

When asked about their career advancement, faculty in private institutions felt they had higher chances of moving up than those in public institutions of higher education. According to [13], private universities tend to promote staff based on their abilities, unlike public universities that mainly refer to tenure guidelines [12]. Furthermore, the 2025 (UNESCO, 2025) report [8] shows that leadership positions are held by fewer women as they age and advance at their workplace, which strengthens unequal promotion cycles.

Although the statistical difference in career mobility between sectors was not substantial, prior studies suggest a trend where private universities provide greater flexibility in professional growth, allowing faculty members to advance based on demonstrated competencies rather than rigid tenure requirements. Despite this advantage, female faculty in private institutions continues to struggle with structural barriers to leadership inclusion (UNESCO, 2025) [13].

4.5 Gender Disparities in Career Advancement

According to statistics, men are more likely than women to be promoted to higher positions in both academic and non-academic sectors. Previous studies have observed that women in universities tend to wait longer for promotions due to the discrimination they face at work and the responsibilities they have at home. According to information from UNESCO, studies by Western universities indicate that women encounter structural limitations in their careers. In contrast, educational institutions in Latin America reveal other cultural barriers that prevent females from advancing their careers [13]. In addition, it has been found that because male-dominated hierarchies usually exist in academia's leadership roles, women do not have the same access to mentors that could significantly help their careers advance [12], [9].

4.6 Trust in AI-Driven Professional Development

With AI in professional development, the opportunities for female instructors with family caregiving responsibilities to access training have increased. Case studies have found that AI-assisted learning increased student involvement by as much as 30% in institutions from Singapore and the UK [6]. However, there are still more concerns among women professors, who want to know if the institution is behind them and how their data is protected. Using AI in professional development may alleviate the challenges faced by female officials who need to balance their professional and personal lives. [6] Discovered that average participation among female educators using blended learning methods went up with the support of digital training platforms, suggesting that AI support can assist in making professional development more available. At the same time, AI-based career development plans are not promoted equally in different institutions. According to [7], men in higher education prefer using digital learning models, whereas women raise questions about the system's stability and the availability of sufficient support from the institution. If universities address these gaps through their policies, more people can benefit from professional development, aligning with the institution's goals for equity.

4.7 Policy Implications for Higher Education

The study results indicate that new policies are needed to create equal opportunities for teachers during their professional development and advancement in their careers. To provide more opportunities for females, universities should establish formal mentorship programs, offer open career advancement pathways, and provide professional development (PD) supported by AI. In private institutions, leaders should include policies that favour female faculty's career opportunities, whereas public universities should find other budget solutions to improve PD reach for everyone [12], [9] (UNESCO, 2025) [13]. To address these inequalities, government agencies should collaborate closely and implement policies to prevent them from worsening.

Without significant changes to institutions, PD will continue to highlight the unfairness in how faculty are involved and advance in their careers. If PD is adequately addressed in both public and private sectors, it can boost a person's career instead of holding them back.

Limitation of the Study

The conclusions may not apply to all universities in Pakistan, as this study was based on a small sample. Haverfield and Tannenbaum argue (2021) [14] that large samples ensure that data analysis is more solid and clear-cut.

1. Because the study looked at only a small number of universities in Pakistan, the results cannot be applied to the whole country. According to Haverfield and Tannenbaum (2021), [14] higher numbers of participants in studies improve the possibility that gender-sensitive interventions can be practised widely.
2. Faculty may not have reported accurately because they tried to present information that others would find favourable. Osten (2019) [15] points out that using people's accounts in surveys can lead to biases, so researchers need reliable ways to assess gender in their studies.

3. Studied Faculty Only – like other study groups that focused entirely on exploring faculty members, this study did not include staff members in administrative positions who sometimes experience career development differently.
4. Cross-Sectional Design – As a result of the cross-sectional study, it only measures gender-sensitive interventions at a single point in time. UNESCO (2025) finds that there have been changes in gender differences in academia over time, urging researchers to examine the issue over an extended period.

Suggestion for Future Research

Longitudinal research would help determine how recent reforms affect female faculty members' opportunities for development and career advancement. According to Haverfield and Tannenbaum (2021) [18], these interventions yield results that persist for 10 years after their implementation. It can be helpful to study gender differences in PD programs globally, as well as in Pakistan, to determine if they are consistent everywhere or specific to a particular country. According to UNESCO (2025), [13] information on gender inequality suggests that it is important to consider the issue globally.

5. CONCLUSION

This study explains the unequal outcomes for male and female staff in various departments of universities in Pakistan. In addition to the opportunities available to them in private institutions, female faculty members still face obstacles in their careers due to the negative influence of society and the workplace. The 2025 UNESCO report [13] advocates for policies that consider gender and recommends establishing effective mentorship and development programs. Public universities often guarantee job security to their employees, but they lack sufficient funds for proper faculty development activities. Overcoming these barriers depends on policies that are often family-friendly, have mentorship programs, and aim for inclusive leadership. Osten (2019) [15] notes that a lack of funding is a significant issue in gender-inclusive policies and suggests reforming the system of funding in society to address this.

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Author Contributions Statement

As the sole author, all research tasks were completed independently. According to the CrediT (Contributor Roles Taxonomy), the author was responsible for the following contributions:

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Bilquees Anwer	✓	✓	✓	✓	✓	✓		✓	✓	✓			✓	

C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

Conflict of Interest Statement

The author declares no conflicts of interest related to this research.

Informed Consent

This is not applicable, as this research did not involve identifiable personal data or direct participant interactions requiring consent.

Ethical Approval

This study did not involve human or animal subjects. Therefore, ethical approval was not required.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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