

Gender Equality in Higher Education: A Comparative Study of Universities in Algeria, Poland, and North Macedonia

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Abstract

Gender equality in higher education is a key global goal, yet significant disparities persist in academic roles and institutions. While women now constitute the majority of university enrollees in many areas, their representation among faculty and leadership remains low, highlighting ongoing horizontal and vertical segregation. Most existing research focuses on national or single-institution trends, leaving cross-institutional comparisons largely unexamined. This study addresses this gap by analyzing gender representation among students, faculty, and administrative staff at three universities: Tlemcen University (Algeria), PANS Krosno University (Poland), and Macedonia University (North Macedonia). We examined institutional data from 2020 to 2025 and contextualized our findings with reports from OECD, EIGE, and UN Women. Our results show significant variations: at Tlemcen University, women comprise 64% of students but are underrepresented among senior faculty. PANS Krosno University has near parity among professors (50.5% female) and a substantial female majority in administration (67%). Macedonia University reports balanced administrative staffing (49% female) but only 44% female professors, especially in STEM. Despite Gender Equality Plans and gender-mainstreaming efforts, women encounter barriers such as biased merit systems and limited leadership opportunities. We recommend targeted strategies to dismantle these obstacles, including embedding gender perspectives in quality assurance processes, implementing equitable hiring practices, expanding mentorship programs, and establishing transparent monitoring of gender outcomes. These measures are crucial for advancing Sustainable Development Goals 4 (quality education) and 5 (gender equality).

Keywords: comparative study, higher education, gender equality, UN SDGs.

Introduction

Gender equality in higher education has gained increasing attention in recent decades (Alam et al., 2025; David, 2015), reflecting its importance in global development agendas and institutional reforms. Significant progress has been made in promoting women's access to higher education and increasing their participation in academic roles (UNESCO, 2024). Education is widely recognized not only as a pathway to individual empowerment but also as a driver of social and economic transformation (Roshan & Rahman, 2025).

However, persistent gender disparities remain within universities, shaping enrollment patterns, career opportunities, and institutional dynamics (OECD, 2023).

Despite numerous institutional and national initiatives, a gap often exists between policy intentions and practical outcomes. Many higher education institutions have adopted Gender Equality Plans (GEPs) and related strategies (Solem et al., 2025; Tagliacozzo & Ilaria, 2021); however, inequalities persist in affecting recruitment, promotion, and representation in academic roles. Barriers linked to cultural norms, institutional structures, and implicit biases remain influential, though their impact varies across social and policy contexts (Abubakar et al., 2021; European Institute for Gender Equality EIGE (2025)).

While existing studies have often examined gender representation at national or regional levels (Ash et al., 2025; Frech, 2025; Ruedin, 2010; Tuki, 2025), fewer have undertaken comparative analyses focusing on specific universities across distinct socio-cultural environments. Moreover, limited research has simultaneously assessed gender representation among students, professors, and administrative staff within a multi-institutional framework. This lack of comparative, institution-level evidence restricts understanding of how local contexts and institutional practices influence gender dynamics in higher education.

To address this gap, this study conducts a focused comparative analysis of three universities located in Algeria, Poland, and North Macedonia, representing diverse socio-cultural and policy settings. These countries have introduced various strategies to promote gender equality; however, the outcomes remain uneven. By analyzing quantitative data on the representation of males and females among students, professors, and administrative staff, the study examines both progress and persistent disparities.

The main objectives of this research are:

- To examine gender representation among students, professors, and administrative staff in the three selected universities.
- To analyze observed disparities within the context of institutional, cultural, and policy factors, drawing on existing literature for interpretation and understanding.
- To highlight similarities and differences in gender representation trends across the three universities.

The significance of this study lies in its comparative and multi-dimensional perspective. By linking representation patterns with policy frameworks and institutional contexts, it provides a deeper understanding of the dynamics of gender equality in higher education. The findings aim to inform universities, policymakers, and international organizations in developing targeted strategies to improve gender balance and promote women's participation in academia. Furthermore, the study aligns with the United Nations Sustainable Development Goals (SDGs), specifically SDG 4 (Quality Education) and SDG 5 (Gender Equality), highlighting the crucial role of higher education in promoting inclusive and sustainable development.

To achieve these objectives, the study is organized into several sections. The literature review provides an overview of previous research on gender equality in higher education,

establishing the theoretical foundation for the study. The methodology section explains the research design, data sources, and analytical approach. The results section presents the findings on gender representation among students, professors, and administrative staff across the three universities. Subsequently, the discussion interprets the findings in relation to existing studies. Lastly, the conclusion summarizes the study's key insights and contributions, while the final section identifies areas for future research.

Literature Review

As institutions of higher learning and knowledge production, universities are expected to promote equity and inclusion. Despite significant improvements in women's access to education, gender disparities continue to persist across different areas of academic life. This literature review examines existing research on gender equality in universities, focusing on three main themes: representation, policy implementation, and institutional practices that influence equality outcomes. The aim is to provide a comprehensive understanding of current challenges and opportunities for fostering a more inclusive academic environment.

Gender equality in universities: a persistent challenge

Gender equality in universities encompasses not only representation but also structural, cultural, and institutional dimensions. Recent studies reveal progress but also highlight enduring disparities. For instance, within the European Union, the proportion of women at the professorial level increased from 24% in 2016 to 26% in 2019; yet, significant barriers still limit women's access to senior academic positions (Rosa & Clavero, 2022). Despite progress in gender representation within academia, women in Australia continue to face barriers to advancement. Although they account for 44% of academic staff, only 31% occupy senior academic roles, highlighting ongoing inequality in leadership positions (Winchester, 2006). Moreover, research from South Africa demonstrates how the intersection of gender and race further complicates equality in higher education, underscoring the need for intersectional approaches (Hlatshwayo, 2020).

Policy implementation: from plans to practice

Many universities have adopted Gender Equality Plans (GEPs) to address structural inequalities. However, their impact varies. Studies indicate that institutional power structures and entrenched organizational cultures often limit the effectiveness of these policies (Clavero & Galligan, 2021). For instance, Germany's "inclusive excellence" framework integrates competitiveness and gender equity, providing a promising model (Zippel et al., 2016).

By contrast, research from Irish and UK universities reveals that policies sometimes focus on "fixing women" rather than addressing systemic barriers, leading to limited progress (Bhopal & Henderson, 2021; Hodgins & O'Connor, 2021)

Gender mainstreaming and pedagogical innovation

Gender mainstreaming initiatives aim to integrate equality into university policies, curricula, and leadership practices. In Albania, such efforts have improved awareness but have not fully overcome horizontal segregation and the underrepresentation of women in

leadership positions (Titili et al., 2024). Similarly, innovative teaching strategies based on feminist pedagogies have been implemented in some universities; however, their adoption remains inconsistent (Torrico et al., 2023).

Our literature shows that progress toward gender equality in universities has been uneven. Key barriers remain, including representation gaps, limited policy effectiveness, and institutional resistance. Addressing these challenges requires a comprehensive approach that combines effective policy implementation, cultural change, and inclusive pedagogical practices. These insights provide the foundation for the current study, which focuses on gender representation and institutional efforts in Algeria, Poland, and North Macedonia.

Methodology

Understanding gender equality in higher education requires a systematic approach to examining differences in representation. For this reason, the study employs a quantitative descriptive design, which enables an objective analysis of gender-related data collected from the selected universities.

Research design

This study employs a quantitative research design to investigate gender equality in higher education across three universities in Algeria, Poland, and North Macedonia. The objective is to analyze the representation of male and female students, professors, and administrative staff in order to identify patterns of disparity and cross-country differences. A quantitative approach was considered most suitable, as it allows comparison of numerical data across institutions and supports systematic evaluation of gender distribution.

Population and scope

The target population of this study includes students, professors, and administrative staff from three universities: (1) Tlemcen University (Algeria), (2) PANS Krosno University (Poland), and (3) Macedonia University (North Macedonia). The study focuses on higher education institutions because universities play a key role in promoting gender equality through policies, representation, and academic opportunities.

Sampling and data sources

This study uses secondary quantitative data to ensure the reliability and comparability of the findings. Data were collected from two primary sources:

The research team obtained university datasets directly from institutional records. These datasets include detailed numbers on students, professors, and administrative staff by gender.

Public reports from international organizations and policy bodies, including the OECD Social Institutions and Gender Index (SIGI, 2023), the European Institute for Gender Equality (EIGE, 2023), and UN Women's Country Gender Equality Profiles (2023).

The data span the period from 2020 to 2025, and reflect changes in gender representation and institutional practices across the three universities.

Data collection process

The datasets used in this study included gender-disaggregated information on: (1) the ratio of male to female students, (2) the ratio of male to female professors, and (3) the ratio of male to female administrative staff.

Additionally, selected reports were reviewed to provide background context on gender equality policies and institutional frameworks. These documents were not analyzed through qualitative coding but were used to support and interpret the quantitative findings.

Data analysis

The quantitative data were organized and analyzed in Microsoft Excel, which facilitated the calculation of ratios and percentages and cross-institutional comparisons. Tables and charts were generated to visualize gender representation across the selected universities. EndNote was used to manage references and maintain a systematic record of all institutional reports and supporting literature.

Ethical considerations

As the study used secondary data, no direct contact with participants was required. However, ethical standards were maintained by: (1) Ensuring that all datasets and institutional records were publicly available and accessed through authorized platforms. (2) Citing all reports and institutional sources accurately. (3) Maintaining academic integrity by using data exclusively for research purposes.

Results

This section presents the study's findings, which are based on gender-disaggregated data collected from three universities: Tlemcen University (Algeria), PANS Krosno University (Poland), and Macedonia University (North Macedonia). The results compare the numbers of male and female students, professors, and administrative staff in these institutions. Information from international reports was also used to provide basic context about national gender equality policies and institutional practices.

Gender equality trends in Algerian higher education

According to the OECD's (2023) Social Institutions and Gender Index (SIGI), Algeria has made progress in gender equality, particularly in education. Women now dominate higher education enrollment, with more female students than male students in many universities. Moreover, despite advancements, the SIGI (OECD, 2023) highlights that women face barriers in leadership roles and employment after graduation.

The SIGI (OECD, 2023) reveals that, although Algeria has made some legal progress, deeply ingrained social norms and specific legal provisions continue to present significant obstacles to achieving gender equality.

Institutional gender policies and academic support in Poland

Data from the European Institute for Gender Equality (EIGE) (2025) on their Poland page and the University of Warsaw’s University of Warsaw (2021) on their Gender Equality Plan states that the first Polish university to adopt a Gender Equality Plan (GEP), focusing on raising awareness, supporting women’s academic careers, and ensuring gender-balanced recruitment.

However, Programs like mini-grants for researchers balancing work and childcare aim to address gender disparities.

Domestic burdens and gender gaps in North Macedonian academia

According to the UN Women (2023) Data Hub, North Macedonia has implemented policies to promote gender equality in education and employment. However, the UN Women (n.d.) and the Economic Commission for Africa (ECA) published a Country Gender Equality Profile for North Macedonia, which states that Women spend significantly more time on unpaid domestic work than men, which can impact their academic and professional opportunities. Therefore, the Gender Equality Index for North Macedonia highlights both progress and areas that need improvement.

Trends in gender representation across universities

In this part, we present gender-disaggregated data from three universities: Tlemcen University (Algeria), PANS Krosno University (Poland), and Macedonia University (North Macedonia). The comparison focuses on students, professors, and administrative staff to highlight variations in gender representation across different academic roles. The following table summarizes the overall distribution and provides a basis for understanding existing disparities between the institutions.

Table 1

Gender distribution across universities: quantitative data analysis

Category	PANS Krosno	Tlemcen	Macedonia
Students	1837	37820	1034
Male	871 (47%)	13687 (36%)	536 (52%)
Female	966 (53%)	24133 (64%)	498 (48%)
Staff members	96	-	146
Male	32 (33%)	-	75 (51%)
Female	64 (67%)	-	71 (49%)
Professors	200	2000	64
Male	99 (49.5%)	925 (46%)	36 (56%)
Female	101 (50.5%)	1075 (54%)	28 (44%)

Note. Compiled by the authors from university-provided datasets.

Table 1 presents the gender distribution of students, professors, and administrative staff across the three universities. At PANS Krosno University (Poland), female students make up 53% of total enrollment, slightly exceeding male students (47%). The representation among professors is almost balanced, with 50.5% female and 49.5% male, while

administrative positions are primarily held by women (67%) compared to men (33%). At Tlemcen University (Algeria), the proportion of female students is higher—64% compared to 36% for males—and women also hold a slight advantage among professors (54% versus 46%). However, data for administrative staff were not available. In contrast, Macedonia University (North Macedonia) exhibits a different pattern: male students comprise 52% of the total enrollment, slightly surpassing females (48%), while male professors hold a majority of academic positions (56% compared to 44% held by females). The administrative staff, however, exhibits a near gender balance, with 51% male and 49% female representation. Overall, the data illustrate variations in gender representation across the three universities, highlighting areas of progress in student enrollment and persistent gaps in academic and administrative roles.

Student enrollment patterns across the three universities

After examining the overall gender distribution across students, professors, and administrative staff in Table 1, Table 2 focuses specifically on the gender distribution among students at the three universities. It highlights the proportion of male and female students, providing a clearer view of enrollment patterns and illustrating differences in participation between genders across institutions.

Table 2

Gender distribution among students in three universities

Students	male	female
PANS Krosno	47	53
Tlemcem	36	64
Macedonia	52%	48%

Note. Compiled by the authors from university-provided datasets.

The data show that at PANS Krosno University, female students represent 53%, while male students represent 47%. At Tlemcen University, the female student population is notably higher at 64%, compared to 36% male students. At Macedonia University, the distribution is relatively balanced, with 52% male and 48% female students.

Gender representation among professors

This table compares the proportion of male and female professors across the three universities, highlighting differences in academic representation.

Table 3

Gender Representation Among Professors Across Universities

professors	male	female
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PANS Krosno	49,5	50,5
Tlemcem	46	54
Macedonia	56	44

Note. Compiled by the authors from university-provided datasets.

The data show that the gender distribution among professors at PANS Krosno University is nearly equal, with 50.5% female and 49.5% male professors. At Tlemcen University, 54% of professors are female, while 46% are male. Macedonia University has the highest proportion of male professors at 56%, with 44% female.

Gender Representation Among Administrative Staff

The following data present gender-disaggregated information on administrative staff at PANS Krosno University and Macedonia University. Information on administrative staff at Tlemcen University was not available in the datasets used for this study.

Table 4

Gender balance among staff members in three universities

Staff members	male	female
PANS Krosno	33	67
Tlemcem	/	/
Macedonia	51	49

Note. Compiled by the authors from university-provided datasets.

The table shows that, among staff members, PANS Krosno University has a female majority of 67%, compared to 33% males. At Macedonia University, the gender balance among staff is nearly equal, with 51% male and 49% female.

Discussion of key findings and implications

This comparative study highlights progress and ongoing challenges in achieving gender equality in universities in Algeria, Poland, and North Macedonia. Therefore, the findings focus on the distribution of male and female students, professors, and administrative staff across the three institutions.

The results show that female students comprise a higher proportion of the student population in most universities. At Tlemcen University, women comprise 64% of the student body, indicating a significant gender gap in enrollment, and this is consistent with broader research on the region, which shows that in many countries in North Africa and the Middle East, women’s participation in secondary and higher education is surpassing that of men (Mojab, 2022). At PANS Krosno University, the distribution is more balanced,

with 53% female and 47% male students, whereas at Macedonia University it is nearly equal (48% female, 52% male). These differences suggest that, although women have greater access to higher education, their participation varies across institutions.

Regarding professors, the data reveal mixed trends. PANS Krosno University shows an almost equal distribution, with 50.5% of professors female and 49.5% male. At Tlemcen University, women slightly outnumber men (54% female, 46% male), whereas at Macedonia University, professors are more male-dominated, with 56% male professors compared to 44% female. This variation indicates that achieving gender balance in academic positions remains a challenge.

For administrative staff, PANS Krosno University has a clear female majority, with 67% of staff members being women. At Macedonia University, the distribution is nearly balanced (51% male, 49% female). Data on administrative staff at Tlemcen University were unavailable, which limits direct comparisons for this category.

These findings are broadly consistent with previous studies on gender representation in European and North African universities. The underrepresentation of women in academic leadership and decision-making roles, despite their high enrollment, is a widely documented phenomenon that suggests persistent structural inequalities (Clavero & Galligan, 2021; Hou, 2022; Klenk et al., 2022; Rosa & Clavero, 2022; Wieczorek-Szymańska, 2020). Furthermore, our results support studies highlighting how regional variations and institutional policies shape gender representation differently across countries (Hou, 2022; Klenk et al., 2022).

The gender distribution patterns observed in this study can be better understood within the broader context of national and institutional policies aimed at promoting gender equality. For instance, the finding that women form a clear majority among administrative staff at PANS Krosno University is consistent with cultural job segregation patterns in Poland, where women frequently occupy administrative and support roles (Wieczorek-Szymańska, 2020).

The results also indicate that progress toward gender equality remains uneven across countries. These findings align with earlier research highlighting variations in gender representation and policy effectiveness. While all three countries have introduced Gender Equality Plans (GEPs), their efficacy differs significantly. In Poland, the adoption of the “inclusive excellence” model seeks to combine competitiveness with gender equality, which may explain the relatively balanced gender representation at PANS Krosno University (Zippel et al., 2016). By contrast, in Algeria and North Macedonia, limited policy enforcement and institutional resistance have slowed meaningful progress. The notable gender gap among professors at Macedonia University, despite near parity in administrative staff, further suggests that without strong institutional commitment, gender policies risk remaining symbolic rather than transformative (Clavero & Galligan, 2021; Hou, 2022; Klenk et al., 2022; Rosa & Clavero, 2022; Wieczorek-Szymańska, 2020).

Differences are also evident in gender mainstreaming and pedagogical innovation. In Poland, some universities have integrated gender equality into teaching and research frameworks, aligning with feminist pedagogical principles (Torricco et al., 2023). North Macedonia has introduced gender-sensitive curricula; however, implementation remains

inconsistent across institutions. In Algeria, gender mainstreaming policies remain limited, often addressing surface-level concerns rather than driving more profound institutional change. These variations demonstrate the multifaceted nature of achieving gender equality in higher education.

Implications of the findings

The findings suggest that achieving genuine gender balance requires a comprehensive approach that involves effective policy enforcement, cultural transformation, and increased promotion of female leadership. The persistent disparities among professors and administrative staff highlight the need for stronger institutional strategies. Universities play a central role in advancing Sustainable Development Goals 5 (Gender Equality) and 10 (Reduced Inequalities), making continuous, targeted efforts toward gender parity essential for long-term progress.

Conclusion

This comparative study highlights the persistent challenges in achieving genuine equity in higher education across Algeria, Poland, and North Macedonia. The data show notable progress in female student enrollment, especially at Tlemcen University and PANS Krosno University. However, disparities persist in academic and administrative roles, with varying degrees of gender balance observed across all three institutions. The observed differences among the universities align with and can be better understood within the broader context of changing national policies, socio-cultural dynamics, and institutional commitments to gender mainstreaming.

The findings from this study reinforce broader research indicating that, although progress has been made, systemic barriers —such as underrepresentation in leadership roles, policy inefficiencies, and cultural biases —continue to hinder efforts to achieve gender equality.

To advance gender equality, universities must take proactive steps, including:

- Implementing targeted recruitment and retention initiatives to ensure equal opportunities for women.
- Enhancing support systems such as mentorship programs, work-life balance policies, and financial aid for female students and faculty.
- Reviewing and revising institutional policies to eliminate discriminatory practices and promote transparency in hiring and promotion.
- Fostering an inclusive and gender-sensitive campus culture by integrating gender awareness into curricula and encouraging diversity in decision-making bodies.

By addressing these issues, universities can create a more equitable academic environment and contribute to achieving Sustainable Development Goals (SDGs) 5 on gender equality and 4 on quality education. Ensuring gender parity in higher education is not just a moral imperative but a strategic necessity for fostering innovation, social progress, and long-term institutional success.

Future Research :

This study provides a foundational quantitative analysis of gender representation but also reveals areas for further investigation. Future research could benefit from a qualitative approach, such as conducting in-depth interviews with professors and administrative staff to gain a deeper understanding of the cultural and institutional factors influencing career progression. Additionally, expanding the scope to include more universities within each Country would provide a more comprehensive national perspective. A longitudinal study could also be valuable for tracking the effectiveness of Gender Equality Plans over time and determining whether they lead to lasting structural changes.

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