

The Role of Women Leaders in The Development of Education and Science in Uzbekistan

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Abstract: This article examines the role of women leaders in the development of education and science in Uzbekistan, with particular attention to the historical changes that have shaped women's access to education, scientific activity, and leadership positions since independence. The study analyses the social, economic, institutional, and cultural factors influencing women's educational opportunities and professional advancement. It explores changes in women's participation in higher education, their representation in scientific research and educational management, and the persistence of gender disparities across academic disciplines. Particular attention is paid to state initiatives aimed at improving women's status and expanding their participation in education and science. The findings highlight the gradual expansion of women's educational and professional opportunities alongside the continued influence of gender stereotypes, economic constraints, and the unequal distribution of women and men across academic and professional fields. The article emphasizes the importance of effective institutional support, equal educational opportunities, and sustained gender-sensitive policies in promoting women's leadership and strengthening their contribution to the development of education and science in Uzbekistan.

Keywords: Women leaders, gender equality, education, science, higher education, women's leadership, gender disparities, educational opportunities, scientific activity, Uzbekistan.

Introduction: Gender equality has become an increasingly important global priority, particularly with regard to strengthening women's participation and leadership in education, science, and other knowledge-intensive fields. Women with advanced education and professional expertise contribute not only to the development of various sectors of society but also to social stability, including through their role in the education and upbringing of future generations. History provides numerous examples of women who made substantial contributions to the advancement of knowledge despite restrictive social, political, and cultural circumstances. Among them are Sofia Kovalevskaya, Marie Skłodowska-Curie, Dorothy Crowfoot Hodgkin, Nodira Begim, and Uvaysiy. Through their intellectual achievements, determination, and commitment to scholarship, these women became influential figures whose work continues to inspire the global scientific community [1].

Over recent decades, scientific and technological progress, advances in medicine and reproductive health, improvements in economic conditions, rising living standards and life expectancy, expanded access to education, growing aspirations for professional development, and wider access to information through television and the Internet have contributed to transformations in traditional gender norms and social expectations [2]. These changes have facilitated women's increasing participation in areas that were historically dominated by men, including metallurgy, mechanical engineering, aviation, and other technical fields. At the same time, initiatives aimed at expanding women's access to education and knowledge have intensified. International and national organizations have increasingly implemented programmes designed to support women, expand equal opportunities, and promote their participation in scientific, professional, and social activities.

METHODS

Ensuring gender equality requires not only formal equality of rights but also substantive opportunities for women and girls to participate fully in education and scientific activity and to benefit equally from scientific and technological advances. International policy frameworks have therefore emphasized the need to increase the participation of women and girls in science and to create institutional conditions conducive to their professional and academic advancement [3]. In accordance with a United Nations resolution, 11 February has been observed annually since 2016 as the International Day of Women and Girls in Science [4]. The initiative seeks to promote meaningful progress in women's and girls' participation in scientific fields and to strengthen equal and equitable opportunities for them in science and research [5]. Within programmes associated with this agenda, more than 2,700 young women have reportedly received support worldwide, while 97 have received international recognition for their contributions in their respective fields, including recognition associated with Nobel Prizes [6].

The development of women leaders in education, science, public administration, and other areas is closely associated with the availability and quality of educational opportunities. Expanding women's access to education increases the potential for the emergence of women leaders capable of contributing to institutional and societal development. President of the Republic of Uzbekistan Shavkat Mirziyoyev has emphasized the broader social significance of women's education, stating: "If we educate one girl, we educate an entire family. When a woman in a family is educated and enlightened, the intellectual and cultural level of society also rises" [7].

The demographic structure of Uzbekistan further underlines the importance of this issue. Women account for 50.3% of the country's population. Of the female population, 29% are girls under the age of 14, 28% are women aged 15–30, 21% are aged 31–45, 15% are aged 46–60, and 7% are over 60 years of age [8]. Thus, approximately 60% of the female population is of working age [9]. Ensuring women's full access to education at the preschool, general secondary, specialized secondary, and higher education levels is consequently an important component of human capital development. Women and girls have increasingly contributed to the development of Uzbekistan's education, culture, and scientific sectors.

At the level of compulsory schooling, there has historically been relatively little difference between boys and girls in access to primary and secondary education. The compulsory nature of schooling has also

reduced the extent to which household economic circumstances determine access to basic education. Consequently, gender disparities become more pronounced at later stages of education, particularly in higher education, where economic constraints, social expectations, and gender norms may interact to influence educational trajectories. During the early post-independence period, women's access to higher education was considerably more constrained. For example, women accounted for approximately 25% of students at the Tashkent Institute of Finance in 1997. In 1993, the number of girls graduating from vocational colleges was 18% lower than the number of boys [10]. Among students and graduates of higher education institutions, the proportion of women was also reported to be approximately 22 percentage points lower than that of men [11]. The decline in women's participation in higher education during this period was associated, among other factors, with the socioeconomic difficulties accompanying Uzbekistan's transition toward a market economy. The introduction and expansion of tuition-based higher education created additional financial pressures for households. As a result, enrolment declined among both women and men. The total number of students in higher education institutions fell from 337,400 in 1991 [12] to 158,206 in 1998 [13]. Rising educational costs, including reported informal payments in some circumstances, together with weaker links between educational attainment and employment opportunities, reduced incentives for some families to invest in women's higher education. In households facing financial constraints, preference could also be given to the education of sons [14].

Economic barriers were accompanied by other factors that constrained young women's access to higher education. Earlier marriage and prevailing family expectations could limit women's opportunities to continue their education. In particular, social pressures surrounding marriage contributed in some cases to the interruption of women's educational trajectories at the transition from secondary to higher education. Another significant issue concerned the concentration of women in a relatively narrow range of educational and professional fields. Women were disproportionately represented in teaching and medicine. For example, women reportedly accounted for approximately 90% of students in medical education [15]. This concentration persisted despite relatively low remuneration and high labour supply in some traditionally feminized occupations.

Geographical disparities in access to higher education represented an additional barrier, particularly for women from rural areas. During the first years of

independence, for example, the only higher education institution in Kokand was a pedagogical institute. Consequently, girls who wished to remain close to their families and continue higher education locally had limited opportunities to pursue fields other than teaching. The limited number of higher education institutions, combined with a higher education enrolment rate of approximately 12% and persistent social perceptions concerning women's education, constrained the expansion of women's participation in higher education.

These conditions also affected the number of women pursuing scientific careers and subsequently limited the emergence of women leaders in science. In 1992–1993, among 10,120 candidates of sciences in Uzbekistan, only 780 were women; among 1,188 doctors of sciences, 160 were women [16]. The representation of women in educational leadership was similarly limited. Between 1991 and 1994, women accounted for approximately 25% of school principals, while no woman served as a rector of a higher education institution. Women constituted approximately 8% of vice-rectors [17]. Gender differences were also visible in the distribution of women and men across professional fields. Men were more strongly represented in sectors offering relatively higher wages, whereas women were concentrated in lower-paid sectors. In 1999, women accounted for only 35% of students specializing in economics, management, and planning. Even in the economics faculty of Tashkent State University, where these fields had previously been considered relatively suitable for women, female students accounted for only 40% in 1997 [18].

A significant policy shift occurred with the implementation of the 1999 “Year of Women” State Programme. Within this framework, the Cabinet of Ministers adopted measures aimed at strengthening women's role in family, state, and community affairs and improving mechanisms for protecting their legal, social, economic, and spiritual interests. Subsequently, women's participation in education and science gradually increased. By the 2005–2006 academic year, women for the first time accounted for more than half of school principals, reaching 50.7%, while women constituted 48.3% of deputy principals [19]. Their representation among school principals continued to grow, reaching 51.9% in 2014, 55.6% in 2015, and 62.1% in 2016, compared with 37.9% for men [20].

According to data from the Academy of Sciences of Uzbekistan, women represented 32% of scientific personnel in 1991, increasing to 38% by 2000. In absolute terms, women accounted for 120 researchers in 1991, 150 in 1995, and 180 in 2000 [21; 22]. This

increase indicates a gradual expansion of women's participation in scientific activity during the first decade of independence. Women's participation in higher education also increased over time. In 1992, women accounted for approximately 34% of students in higher education institutions [23]. By 2002, women constituted 42.7% of students in Uzbekistan's higher education institutions. Their representation was particularly high in health care, physical education, education, arts, and cinematography. Women accounted for 23% of students in economics and law, 20% in technical fields, and 11% in agriculture [24].

Data for the 2000–2004 period demonstrate a gradual increase in female enrolment. In the 2000–2001 academic year, the number of male students was reported at 114,200 compared with 69,400 female students; in 2001–2002, the respective figures were 127,100 and 80,100 [25]. In 2002–2003, male enrolment reached 141,900 and female enrolment 90,400, while in 2003–2004 the corresponding figures were 155,600 and 98,800 [26]. These data indicate that female participation in higher education increased during this period, although a substantial gender gap remained.

Addressing these disparities became an important interdisciplinary research and policy issue. Historians, sociologists, educators, psychologists, philosophers, and specialized research institutions were increasingly tasked with examining international experience in higher education development and human-resource training, as well as adapting relevant approaches to national conditions [27].

By 2004–2005, approximately 30,500 students were enrolled in academic lyceums, of whom 35.9% were girls. Vocational colleges enrolled approximately 757,600 students, with girls accounting for 47.3%. In higher education institutions, male enrolment reached 156,300 compared with 107,300 female students; in 2005–2006, the corresponding figures were 164,800 and 113,900 [28]. At the same time, women's educational choices remained highly concentrated. Approximately 60% of female students in higher education were enrolled in pedagogical programmes. In 2005, women constituted 44.5% of the economically active population, while women accounted for approximately 59% (247,566) of teaching personnel in general secondary schools [29]. By 2008, the female literacy rate was reported at 92.8% [30]. In the 2010–2011 academic year, Uzbekistan had 65 higher education institutions with approximately 274,500 students. Girls accounted for approximately one-third of the student population. The higher education enrolment rate among women of the relevant age group was approximately 5%, compared with nearly 8%

among men [31].

RESULTS

The decline in female participation in higher education that had become visible from the mid-2000s was more pronounced among girls than boys. The discontinuation of part-time higher education in 2004 also affected women's access, particularly for those who needed to combine education with family or employment responsibilities. Subsequent growth in enrolment occurred against the background of overall population growth. Gender differences were also evident across fields of study. Women remained underrepresented in technical disciplines, accounting for approximately 18% of bachelor's students and 19% of master's students in these fields. By contrast, women were more strongly represented in the humanities and teacher education, where their shares were approximately 51.2% and 56%, respectively. In pedagogical programmes, the proportion of female students reached approximately 62–65%.

An analysis of educational specialization demonstrates persistent gender segmentation in field selection. Approximately one in four female graduates completed a pedagogical programme, while graduates of education-related higher education institutions accounted for up to 80% of all female graduates in some periods. At the same time, the participation of girls and women in education-related fields continued to increase. Whereas graduates of education-related higher education institutions accounted for approximately 70% of female graduates in the early 2000s, the figure reached approximately 80% by 2010. The proportion of female students within these programmes also increased from 50.2% to 58.5%.

Girls continued to show a strong preference for education and health-related fields. Between 2000 and 2010, women maintained a comparatively high level of participation in medical education. By contrast, their participation remained substantially lower in construction, transport, and communications—fields traditionally perceived as “male occupations.” Women represented less than one-quarter of graduates in these fields. Their participation in economics and law also remained relatively low, at no more than 20% and 16%, respectively. This pattern points to persistent gender segmentation within the education system. Such segmentation may contribute to the concentration of men and women in particular sectors of the labour market and, consequently, to the reproduction of occupational gender stereotypes.

Women's access to higher education has also been shaped by family and social expectations in addition to economic constraints. In some cases, parents were

reluctant to send daughters to study far from home. This was particularly significant because a large proportion of higher education institutions—approximately two-thirds during the period under consideration—were concentrated in Tashkent, Samarkand, and Andijan. Such geographical concentration increased the costs associated with higher education and created additional barriers for students from other regions.

Family expectations could also influence women's educational trajectories after enrolment. During higher education and particularly at the transition to postgraduate study, some women faced a choice between continuing their education and entering marriage and family life. In contexts where family responsibilities were prioritized, women could discontinue their studies before completing advanced degrees. Consequently, the interaction between educational access, geographical mobility, economic resources, and family expectations remained an important factor shaping women's participation in higher education and, subsequently, their opportunities to develop scientific careers and assume leadership positions.

In addition, family responsibilities associated with childbirth and childrearing have also constrained women's opportunities to continue their higher education. In Uzbekistan, first childbirth has traditionally occurred predominantly among women around the age of 20. This circumstance has contributed to a decline in the number of women progressing to subsequent stages of higher education. The limited availability of part-time study has further restricted educational opportunities for women engaged in household responsibilities and childcare.

According to the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated 11 July 2012, “On the Procedure for Admission of Citizens Who Have Completed Compulsory Military Service in the Armed Forces of the Republic of Uzbekistan to Higher Education Institutions,” citizens who had completed compulsory military service and received recommendations from the command of their military units were granted an admission benefit equivalent to an additional 50% of the points they had obtained in entrance examinations when applying to bachelor's degree programmes at higher education institutions across the country. This policy created an additional structural advantage for male applicants in the higher education admission process. As a result, whereas the proportion of men and women enrolled in higher education was approximately 64% and 36%, respectively, in 2011, the corresponding figures changed to 67% for men and 23% for women in 2012.

During the 2010s, women accounted for no more than 45% of graduates of higher education institutions. However, subsequent years witnessed a positive shift in this trend, accompanied by a steady increase in the number of women obtaining higher education qualifications. In particular, after 2017, enrolment in higher education increased among both women and men. Several factors contributed to this development. First, new higher education institutions were established, opportunities were created for students to obtain educational loans with repayment periods of up to seven years, admission quotas were expanded, and additional grant mechanisms were introduced, particularly for female applicants from low-income families. The introduction of distance learning also enabled individuals with work experience but only secondary-level qualifications to pursue higher education. At the same time, students were given the opportunity to pay tuition fees in four instalments.

The expansion of the higher education sector, including the establishment of private institutions and new higher education institutions in the regions, contributed to an increase in the number of higher education institutions from 76 to 119, including 17 branches of foreign universities. Beginning in 2019, new educational formats were introduced, including four Presidential Schools and three specialized creative schools. In addition, 19 new higher education institutions were established, nine of which were branches of leading foreign universities. As a result, the training of specialists was organized through 141 joint educational programmes implemented in cooperation with leading international universities. In 2019, 146,500 students were admitted to higher education institutions in Uzbekistan, representing approximately twice the number admitted in 2016.

By 2020, 17.4% of students were studying on the basis of state-funded grants, while 82.6% were enrolled under tuition-based contracts. During the 2019–2020 academic year, the higher education student population consisted of 238,500 male students (54.08%) and 202,500 female students (45.92%). According to more recent data, approximately 598,000 women and girls were studying in higher education institutions in Uzbekistan, accounting for around 50% of the total student population. Their share had been 39% in 2014, indicating an increase of approximately 11 percentage points over the period.

Adult literacy rates have also remained high for both men and women. According to the cited data, the literacy rate among adult men was 99.72% (11,538,124 people), compared with 99.47% among adult women (11,863,952 people). Overall, women's access to education and healthcare services in Uzbekistan has

improved substantially. Higher education participation, in particular, has expanded rapidly. Between 2017 and 2022, the proportion of men with higher education reportedly increased threefold to 29%, while the corresponding proportion among women increased fourfold to 27.4% [32].

CONCLUSION

By 2025, women accounted for approximately 50% of students enrolled in higher education institutions. At the same time, tuition fees were covered for 15,000 female students enrolled in master's programmes. Until relatively recently, various objective and subjective factors limited female students' ability to continue their education at the master's level. Beginning in 2022, however, a state-funded mechanism was introduced to cover tuition fees for female master's students. Under this initiative, tuition costs for 23,000 female students were financed from the state budget, with approximately UZS 200 billion allocated for this purpose annually. During the 2022–2023 academic year, tuition fees amounting to UZS 152.9 billion were covered for 14,110 female students through state budget resources.

Additional measures have also been introduced to expand women's educational opportunities. These include sending 50 young women annually to prestigious foreign universities for bachelor's-level study and 10 women for master's-level programmes, as well as providing opportunities for female students with young children to pursue distance education. By 2025, the number of women enrolled in master's programmes had exceeded 15,000. The expansion of access to postgraduate education is particularly significant for the development of women's academic careers, as it provides greater opportunities for women to continue their education beyond the undergraduate level and to engage in scientific research.

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