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D4.1 Guidelines female and young researchers

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Executive summary

This deliverable provides an assessment of the current gender digital divide in the participating countries in DIGITAfrica, namely Cameroon, Kenya, Senegal, South Africa, Tunisia. It also presents the European context.

Within the implementation of WP4, a survey organised within the partners countries for professors and students and their education needs in the context of DIGITAfrica. The initial results of the survey related to the inclusion of female and young researchers are presented in the report. They contributed to the achievement of one of the key results of the project (KR4) by proposing early-stage policy and innovative education solutions to raise awareness towards female and young researchers, promoting opportunities and cooperative activities.

Finally, recommendations and guidelines to female and young researchers and the relevant policy makers are prepared and included.

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Abbreviations

Abbreviation	Definition
DTSA	Digital Transformation Strategy for Africa
AGCCI	African Girls Can Code Initiative
AUC	African Union Commission
ITU	International Telecommunication Unit
PEES	*Programme d'Encouragement à l'Excellence Scientifique* (Program for the Encouragement of Scientific Excellence)
PRF	*Projet de Recherche Fédérée* (Federated Research Project)
PEJC	*Programme d'Encouragement des Jeunes Chercheurs* (Program for the Encouragement of Young Researchers)
ATFN	Tunisian Association of Digital Women
STEM	Science, Technology, Engineering, and Mathematics
INS	National Institute of Statistics
ATFN	Tunisian Association of Digital Women
MESRS	Ministry of Higher Education and Scientific Research
MESRI	Ministry of Higher Education, Research and Innovation
PAPES	Promotion of Female Teachers and Researchers
SGCI2	Science Granting Councils Initiative
CRE	Research and Testing Centers
EACEA	European Education and Culture Executive Agency
UAM	Senegalese Amadou Mahtar Mbow University
HEIs	higher education institutions
FAWE	Forum for African Women Educationalists
SAWiSA	South African Women in Science Awards
nGAP	New Generation of Academics Programme
NESP	Nurturing Emerging Scholars Programme
SAYAS	South African Young Academy of Science
BWIS	Black Women in Science
STI	Science, Technology, and Innovation
CAYS	Cameroon Academy of Young Scientists

SGCI	Science Granting Councils Initiative
ARISE	African Research Initiative for Scientific Excellence
FFSC	*Forum des Femmes Scientifiques du Cameroun*
ICT	Information, Communications Technologies
WiD	Women in Digital
AI	Artificial Intelligence
OECD	Organisation for Economic Co-operation and Development
DESI	Digital Economy and Society Index
ITU	International Telecommunication Union
ECWT	European Centre for Women and Technology

1 Introduction

The rapid digital transformation underway across Africa presents a unique opportunity to accelerate economic growth, yet this potential is fundamentally constrained by a persistent **gender digital divide**. This inequality prevents female and young researchers from fully participating in and leading the continent's digital research future, ultimately compromising the quality and societal impact of digital science solutions. Gender inequality in research, though not new, risks being exacerbated by the widening digital gap.

This document, **D4.1 – Guidelines for Female and Young Researchers**, is a critical output of the DIGITAfrica project, designed to directly contribute to **the project objective #4: enhanced learning and participation of female and young researchers**. It serves as a necessary intervention to ensure diversity (in race, gender, age, and background) is actively understood, respected, and preserved as a winning factor that empowers digital research.

To create a fact-based, actionable framework, this deliverable first provides an essential assessment of the current gender digital divide within the five participating African countries (Tunisia, Senegal, Kenya, South Africa, and Cameroon), supplemented by the context of the European Union. Crucially, it integrates the **initial findings of the dedicated DIGITAfrica survey** of African professors and students, which directly informed the final policy and education solutions presented.

This deliverable concludes by presenting **early-stage policy and innovative education solutions** structured as tangible recommendations and guidelines. These measures are directly prepared for **female and young researchers** themselves, alongside the **relevant policy makers**, with the aim of promoting opportunities, cooperative activities, and awareness toward achieving an inclusive and sustainable digital future for Africa.

Efforts to overcome gender inequality are ongoing in Africa and beyond. Digital transformation presents an opportunity to not only close the gender inequality gap, but also to prevent the widening of the gender gap in the digital economy. In Africa, digital transformation is on the rise[1]. There are approximately 500 million+ internet users[2] and 330 million+ e-commerce consumers out of its almost 1.4 billion people[3].

This report provides an assessment of the current gender digital divide in the participating countries in DIGITAfrica, namely Camerron, Kenya, Senegal, South Africa and Tunisia. In addition, it presents the European context. Within the implementation of WP4, a survey organised within the participating countries for professors and students and their educations

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[1] European Investment Bank, "The rise of Africa's digital economy" (February 2021); Website: https://www.eib.org/en/publications/the-rise-of-africa-s-digital-economy; (Accessed: 16/12/2025)
[2] Statista, "Internet usage in Africa - statistics & facts" Website: https://www.statista.com/topics/9813/internet-usage-in-africa/#topicOver-view (Accessed: 16/12/2025)
[3] Accenture, "Tuning into Africa's digital transformation" (26 February 2022) Website: https://au.int/sites/default/files/documents/38507-doc-DTS_for_Africa_2020-2030_English.pdf (Accessed: 16/12/2025)

needs in the context of DIGITAfrica. The initial results of the survey related to the inclusion of female and young researchers are presented in the report. Finally, recommendations and guidelines to female and young researchers and the relevant policy makers are prepared and included.

2 Current state of the art of gender equality in the African countries

This chapter presents the current state of the art of gender equality in research in the participating African countries related to the experimental-based research in Digital Sciences.

2.1 Introduction – background

The African Union's visionary 2020-2039 Digital Transformation Strategy for Africa (DTSA)[4] includes plans to create a Digital Single Market, expand universal access to basic connectivity, improve the enabling environment, and digitize the agriculture, health, and education sectors. The DTSA acknowledges the existence of "a gender gap in mobile access and usage" as being one of the threats to digital transformation in[5] the AU and warns that, "Failure to address this [gender gap] could result in greater inequality for women across the continent. Since 2018, the World Bank Group's Digital Economy 4 Africa Initiative (DE4A)[6] has invested $10 billion over 100 projects across the continent.

According to the World Bank (DE4A), only 36% of Sub-Saharan Africans have access to broadband internet and, for those who do have access, basic data plans can cost up to three times more on the continent than in regions with more advanced digital infrastructure.

The continent also faces a persistent digital gender gap. Within Sub-Saharan Africa, mobile internet use, the primary access point for internet users, has a 37% gender gap, reflecting the over 190 million women not using mobile internet services. This digital gender gap extends to the growing digital economy in Africa, where women-owned or led businesses are often lag in adoption and use of these technologies.

Some of the core causes of the digital gender divide are barriers to accessing digital infrastructure, affordability, (lack of) education and relevant skills, and lack of technological literacy. Worse still are the inherent biases and socio-cultural norms that lead

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[4] Website: https://au.int/en/documents/20200518/digital-transformation-strategy-africa-2020-2030 (Accessed: 16/12/2025)
[5] African Union Commission, The African Union's Digital Transformation Strategy for Africa (2020-2030), *African Union* Executive Council Decisions related to ICT1, ECA Resolution (812 –XXXI) p. 3.
[6] Website https://www.worldbank.org/en/results/2023/06/26/from-connectivity-to-services-digital-transformation-in-africa (Accessed: 16/12/2025)

to gender-based digital exclusion[7]. However, the DTSA has set a goal of digital inclusion for every African by 2030.

Given Africa's digital gender divide, strategic initiatives have objectives to include females and address the root causes of gaps in access, literacy, and usage, notably by investing in STEM education and ICT skills training for females and girls. However, for African governments and international donors to achieve their ambitious digital transformation goals for the region, women need to be engaged not just as passive beneficiaries of programs and policies, but as a set of active and emerging champions catalysing digital growth.

There are many factors affecting women's participation in digital transformation and inclusion in the digital economy. The most prominent ones include lack of access to digital infrastructure, lack of (equal) access to funding/financial services, existing gender gaps in the physical world and exclusion from training. Several initiatives have been implemented to address some of these challenges, including the African Girls Can Code Initiative (AGCCI)[8], an initiative of UN Women, the African Union Commission (AUC)[9] and the International Telecommunication Unit (ITU)[10] to impart digital skills to girls. Training is the most 'popular' approach taken to address digital divide. Private sector organisations such as Vodafone with 'Code Like a Girl initiative'[11], and other initiatives by international partners such as the 'eSkills4Girls initiative', introduced during the Germany G20 Presidency, are some of the examples.

There is a need to go beyond training and digital capacity building to close the gender digital divide. A holistic approach that looks beyond access issues (skills, infrastructure and affordability). Strategic policy direction and implementation that empowers women beyond 'access' issues. There is a need to pierce the veil and look at power dynamics affecting the use of technology by women, and the issues with policy development and (resistance in) policy implementation.

At the continental level, the African Transformation Report (2025)[12] highlights that African nations have expressed strong commitments to achieving gender equality. Many have ratified key regional instruments such as the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women (Maputo Protocol, 2003)[13] and the African Union Solemn Declaration on Gender Equality (2004)[14]. Despite these commitments, significant gender disparities persist. Much of the challenge in advancing technological development

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[7] OECD, "Bridging the Digital Gender Divide" (2018) 22 Website;
https://www.oecd.org/digital/bridging-the-digital-gender-divide.pdf (Accessed:16/12/2025)
[8] Website: https://africa.unwomen.org/en/where-we-are/eastern-and-southern-africa/liaison-office-to-au-and-uneca/african-girls-can-code-initiative-agcci (Accessed: 16/12/2025)
[9] Website: https://au.int/en/commission (Accessed: 16/12/2025)
[10] Website: https://www.itu.int/en/Pages/default.aspx (Accessed: 16/12/2025)
[11] Website: https://www.codelikeagirl.com (Accessed: 16/12/2025)
[12] Website: https://acetforafrica.org/atr2025/(Accessed: 16/12/2025)
[13] Website: https://www.amnesty.org/en/wp-content/uploads/2021/09/ior630052004en.pdf (Accessed: 16/12/2025)
[14] Website: https://www.mrfcj.org/pdf/Solemn_Declaration_on_Gender_Equality_in_Africa.pdf (Accessed: 16/12/2025)

across African countries arises from women's limited access to resources and entrenched social and cultural norms that favour men. Gender norms—particularly those associated with negative perceptions of women's engagement in technology—restrict women's participation both within households and in technology-oriented industries.

The research landscape in Sub-Saharan Africa reflects similar inequalities. As of 2020, women accounted for only 31.4% of researchers in the region[15]. While some countries, such as South Africa and Cape Verde, have reached gender parity, others, including Guinea, remain far below the acceptable threshold of 45–55% representation.

Data further reveal that women in low-income countries are less likely than men to use the internet, own mobile phones, or access digital financial services. Across low- and middle-income nations, there are over 300 million more men than women using mobile internet, and smartphone ownership is 20% higher among men[16]. In Africa, only 24% of women use the internet compared to 35% of men, a gap driven by factors such as limited-service availability and affordability, cultural and social barriers, and inadequate digital skills[17]. These disparities are even more pronounced among rural, low-income, and less-educated women, who are disproportionately excluded from the digital sphere.

2.2 Equal opportunities for females and young researchers in Cameroon

As of 2024, Cameroon's population is projected at approximately 29.12 million, with a slight female majority of 50.16%. The population is predominantly young, with a median age of 17.7 years and about 46.2% under the age of 25, representing a significant potential reservoir for the research and innovation ecosystem[18]. However, this potential is tempered by challenges in education and inclusion. Female literacy (71.6%) lags male literacy (77.1%), and a gender gap persists in tertiary education enrolment (13% for women vs. 15% for men).

This disparity is particularly pronounced in Science, Technology, and Innovation (STI). While female enrolment is relatively strong in the natural sciences, it diminishes significantly in health sciences and agriculture and is most acute in engineering, where female students are

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[15] UNESCO. (2020). Other policy relevant R&D indicators: Female researchers as a percentage of total researchers (in headcounts - HC and full-time equivalents - FTE). Retrieved April 26, 2023, from Website: http://data.uis.unesco.org/index.aspx?queryid=64# (Accessed: 16/12/2025)

[16] GSMA. 2020. Connected Women: The Mobile Gender Gap Report 2020. GSM Association. Website: https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/05/GSMA-The-Mobile-Gender-Gap-Report-2020.pdf (Accessed: 16/12/2025)

[17] UN Women Africa Strategy 2022-2025, Website: https://africa.unwomen.org/sites/default/files/2024-12/un_women_africa_strategy_2022_-2025_0.pdf (Accessed: 15/12/2025)

[18] World Bank Data: Population, Cameroon (2024)

"severely" underrepresented[19]. This underrepresentation at the student level directly impacts the pipeline for female researchers in these critical fields.

At the national level, several key initiatives are in place to foster inclusion, including affirmative action from the Ministry of Higher Education which has implemented a quota system for hiring women scientists as university lecturers, alongside financial support mechanisms such as scholarships and a dedicated special fund for young women excelling in scientific and technical studies[20]. Furthermore, institutional support for the next generation is provided through the Cameroon Academy of Young Scientists (CAYS), an arm of the Cameroon Academy of Sciences, which offers a dedicated platform for young researchers to network, access capacity-building opportunities, and engage with the broader scientific community.

International collaborations and civil society initiatives are crucial in complementing national efforts to empower researchers in Cameroon. The country's membership in the Science Granting Councils Initiative (SGCI) has enabled capacity building for the Ministry of Scientific Research and Innovation (MINRESI) in integrating gender and inclusivity into research funding. Furthermore, programmes like the EU-funded African Research Initiative for Scientific Excellence (ARISE) provide substantial grants to early-career researchers, including Cameroonians, while the L'Oréal-UNESCO For Women in Science programme, with its local chapter in partnership with CAYS, offers awards, mentorship, and networking for female scientists. Complementing these, the HIGHER Women Consortium, established by women health researchers, provides crucial mentoring and skills development for early-career women scientists, directly addressing the lack of role models and research capacity in health sciences[21].

The year 2025 marked significant national gatherings that have shaped the current agenda for supporting researchers. The 2025 *Forum National des Jeunes Chercheurs* concluded with a decisive call for structural reforms to empower the next generation of scientists[22]. Similarly, the 2025 *Forum des Femmes Scientifiques du Cameroun* (FFSC) outlined a clear action plan to advance gender equality in research. Its central point's advocate for making gender equality and anti-harassment policies mandatory in all academic institutions, launching a national "Women in STEM" mentorship program to connect students with senior scientists, and insisting on transparent gender-disaggregated data in national grant processes to monitor and enforce equitable funding distribution[23].

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[19] Kinge, T. R., Wiysahnyuy, L. F., Awah, T. M., & Nkuo-Akenji, T. (2020). Current statistics in Science, Technology and Innovation in higher education in Cameroon and the establishment of gender participation. African Journal of Rural Development, 5(3), 105-142

[20] UN Women. (2005). *National Mechanisms for Gender Equality in Cameroon*

[21] Nolna, S.K., Mekongo, P.E., & Leke, R.G.F. (2017). Mentoring for early-career women in health research: the HIGHER Women Consortium approach. Global Health, Epidemiology and Genomics, 2, e3

[22] Website: https://www.ird.fr/yaounde-lird-au-forum-national-des-jeunes-chercheurs-2025 (Accessed: 16/12/2025)

[23] Website: https://www.lesgosciencent.com/forum-des-femmes-scientifiques-du-cameroun-ffsc-2025/ (Accessed: 16/12/2025)

2.3 Equal opportunities for females and young researchers in Kenya

Kenyan universities still report gender gaps in senior positions and research outputs. Analyses have noted how few women occupy top leadership positions, for example, in 2021 only four vice-chancellors out of sixty-two were female[24]. A 2024/2025 report by the Commission for University Education in Kenya[25] on university statistics shows 256,906 female students were enrolled at university compared to 320,439 male students. The report further indicates that 9,887 staff (approximately 64%) are male, while 5,447 (around 35%) are female. An earlier report on university statistics[26] stated that 25% of researchers were males in the 31-40 age group, while 21% of researchers were females in the same age group. 17% of researchers in the 41-50 age group were females, with 14% being males in that age group.

This means that most Kenyan researchers are relatively young. However, this cohort faces challenges of limited time and support to publish, apply for grants, and attend conferences, yet these are the gateways to visibility and promotion at work. Female researchers face the same challenges with many getting fewer chances to attend regional and international meetings, which leads to less exposure and fewer opportunities to collaborate in applying for research grants.

In addition, female academics are assigned heavy teaching leaving them with little protected time for research. As a result, young women academics feel this acutely because early-career years are when publication records are built, and they cannot manage to publish at that stage. Female researchers also encounter socio-cultural exclusion and discrimination that is grounded on ethnicity. This affects choice of project leads such as principal investigators, thus adding a further layer to the gender disadvantage. Together, these conditions translate into lower contribution by women in prestigious conference proceedings, book publishing, and principal-investigator roles. This cumulatively ends up affecting the overall outcomes that slow progression into senior, managerial positions.

24 Zvavahera, P. et al. (2021). Exploring the Relationship Between Gender and Competencies Development in Higher Education Institutions: Perspectives From a University in Zimbabwe. Website: https://www.qeios.com/read/DYXQH0.2 (Accessed: 16/12/2025)

[25] Commission for University Education (2025). University Statistics (2024/2025). Website: https://www.cue.or.ke/index.php?option=com_phocadownload&view=category&download=286:university-statistics-2024-2025&id=90:research-reports&Itemid=187 (Accessed: 16/12/2025)

[26] Commission for University Education (2018). University Statistics (2017/2018). Website: https://www.cue.or.ke/index.php?option=com_phocadownload&view=category&download=205:2017-2018-university-statistics-report-approved-doc&id=18:universities-data-0-3 (Accessed: 16/12/2025)

Kenya is considered as a continental leader when it comes to access to digital infrastructure[27]. Kenya's digital economy contributes to the Gross Domestic Product (GDP) at 7.7%, followed by Morocco at 6.82% and South Africa at 6.51%.[28]

The Global System for Mobile Communications (GSMA) Mobile Gender Gap Report of 2019 highlighted that women in Kenya are 39% less likely than men to have access to mobile internet and are also 23% less likely to own a smartphone.[29] This gender digital divide appears to be growing, with the gender gap in mobile internet use increasing from 34% in 2019 to 42% in 2020. A 2021 study titled 'Kenya's Digital Economy: A People's Perspective' also found that only 35% of women use advanced digital services compared to 54% of men.[30]

Kenya is currently adopting various high-level policies and strategies to better address digital transformation and the improvement of its ICT sector.[31] Kenya has enabled forward-leaning investment and innovation in core digital infrastructure by creating a technology start-up ecosystem for advanced digital applications and services supported by the guidance of Kenya's long-established mobile money sector, and a favourable regulatory environment. It has also made progress in defining policies and frameworks for enabling resources, such as the country's digital ID system, and investing in support ecosystems that can help people access and use digital services.[32]

Women face numerous barriers to digital inclusion, including lower levels of basic education—which limits digital literacy—restrictive sociocultural norms that prioritize men's access to technology, and economic constraints that reduce affordability of digital devices and services. This digital gender divide hinders women's participation in entrepreneurship and formal employment, constraining their overall contribution to economic growth and structural transformation.

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[27] Dalberg, "Kenya's Digital Economy: A People's Perspective" (November 2021) Website: https://dalberg.com/our-ideas/kenyas-digital-economy-a-peoples-perspective/ (Accessed: 19/12/2026)

[28] M. Namasaka, "Why Kenya needs an inclusive digital transformation" (March 2023) *UNDP Kenya Website:* https://undp-kenya.medium.com/why-kenya-needs-an-inclusive-digital-transformation-ce8b162e9c94 (Accessed: 19/12/2025)

[29] A. Muhura, "Accelerating digital inclusion for women in Kenya" (28 May 2019) *GSMA* GSMA | Accelerating digital inclusion for women in Kenya | Mobile for Development. Website: https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-for-development/blog/accelerating-digital-inclusion-for-women-in-kenya/ (Accessed: 19/12/2025)

[30] M. Namasaka, "Why Kenya needs an inclusive digital transformation" (March 2023) *UNDP Kenya Website:* https://undp-kenya.medium.com/why-kenya-needs-an-inclusive-digital-transformation-ce8b162e9c94 (accessed: 19/12/2025)

[31] International Telecommunication Union, "Collaborative regulation for digital transformation in Kenya: A country review" (2023) 1 Website: https://digitalregulation.org/wp-content/uploads/D-PREF-THEM.32_Kenya-2023-PDF-E.pdf (Accessed: 19/12/2025)

[32] Dalberg, "Kenya's Digital Economy: A People's Perspective" (November 2021) Website: https://dalberg.com/our-ideas/kenyas-digital-economy-a-peoples-perspective/(Accessed: (19/12/2025)

2.4 Equal opportunities for females and young researchers in Senegal

The Senegalese population, estimated at 18,126,390 in 2023[33], comprises 50.6% men and 49.4% women. It is a predominantly young population, with over half under the age of 19 and 75% under 35. The median age is estimated at 18 years, reflecting a significant potential for human capital development[34]. The estimated number of students in public and private Senegalese universities in 2024 is 279,916, with a female population comprising 52.17%[35].

Research in Senegal is conducted primarily within universities and research institutes, and to a lesser extent within companies through research and development (R&D) activities. As of 2024, the total number of researchers, including lecturers/researchers, doctoral students, and master's students, stands at 21,044. The distribution of researchers by category shows that 57.90% are master's students, 30.31% doctoral students, 11.64% lecturers/researchers, and 0.15% full-time researchers. The proportion of women varies by level of study, representing 40.61% at the master's level and 33.15% at the doctoral level. In 2023, the 14 doctoral schools across Senegalese universities supervised 6,378 PhD students (Years 1-3), including 4,224 men and 2,154 women, resulting in an overall female researcher proportion of 36%.

Women's participation in STEM fields (Science, Technology, Engineering, and Mathematics) has been improving, although it remains relatively low in research and development activities. The gender parity index increased from 0.67 in 2018 to 1.027 in 2023, reflecting gradual progress[36]. To promote gender equity, the Ministry of Higher Education, Research and Innovation (MESRI) has launched an affirmative action initiative through the Program for the Improvement and Promotion of Female Teachers and Researchers (PAPES). This program has funded more than 100 projects led by female teachers, researchers, and doctoral students. Moreover, gender considerations have been integrated into research funding mechanisms: in 2023, five (5) of the eleven (11) projects funded under the Science Granting Councils Initiative (SGCI2) were led by women researchers.

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[33] Recensement général de la Population et de l'Habitat (RGPH- 5) et Projections démographiques (General Population and Housing Census (RGPH-5) and Population Projections), Website: www.ansd.sn (Accessed : 16/12/2025)

[34] General report of the 5th GENERAL POPULATION AND HOUSING CENSUS, (RGPH-5, 2023), Website: https://www.ansd.sn/sites/default/files/recensements/rapport/rapport_national/RGPH-5_Rapport%20global-Prov-juillet2024_0.pdf (Accessed: 16/12/2025)

[35] Lettre de Politique Sectorielle de Développement 2025-2029 (Sector Development Policy Letter, 2025-2029), Ministry of Higher Education, Research and Innovation, January 2025. Website: https://mesrisenegal.sn/2025/03/11/lpsd-2025-2029-un-plan-strategique-pour-moderniser-lenseignement-superieur/ (Accessed: 16/12/2025)

[36] Lettre de Politique Sectorielle de Développement 2025-2029 (Sector Development Policy Letter, 2025-2029), Ministry of Higher Education, Research and Innovation, January 2025. Website: https://mesrisenegal.sn/2025/03/11/lpsd-2025-2029-un-plan-strategique-pour-moderniser-lenseignement-superieur/ (Accessed: 16/12/2025)

Senegal also hosts 24 Research and Testing Centres (CRE)[37] distributed throughout the country. In 2019, as reported by the distribution of users in CRE, women constitute 50.37% of the participant base. These centres serve as vital interfaces between researchers and the public, facilitating the dissemination and popularisation of scientific knowledge, the transfer of innovative technologies, and the promotion of a robust scientific culture. They also contribute to making research and innovation more inclusive, with a particular focus on women and youth empowerment.

Furthermore, with funding from the European Commission, through the European Education and Culture Executive Agency (EACEA), the Senegalese Amadou Mahtar Mbow University (UAM) co-implements the Elevate-HER project (Female Research Empowerment and Academic Career Reinforcement in Senegal Higher Education)[38]. This project offers personalised professional development plans and promotes systemic change within higher education institutions (HEIs) by establishing institutional career development programs and gender support units. In parallel, the Institutional Strengthening for Gender Equity and Equality in Senegal project, funded by Global Affairs Canada, supports public institutions in strengthening inclusive governance and advancing gender equality and women's and girls' empowerment across the country[39]. Further, the Forum for African Women Educationalists (FAWE)/Mastercard Foundation Phase II program[40] (2024-2030) empowers a new generation of girls and women, providing opportunities for disadvantaged 15- to 25-year-olds. This seven-year, ten-country initiative, which includes Senegal, offers comprehensive pathways to higher education, vocational skills development, and the workforce.

Additionally, in alignment with the National Strategic Plan for Research and Innovation (2023–2032), Senegal government is pursuing the establishment of a National Research and Innovation Fund designed to foster inclusivity and excellence in research[41]. Within this framework, Sub-Fund 4 will be specifically dedicated to enhancing the participation of women, youth, and other vulnerable groups, including persons with disabilities, in research and innovation teams. This sub-fund is projected to reach an estimated allocation of one hundred and twenty (120) billion CFA francs by December 31, 2027.

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[37] Website: https://mesrisenegal.sn/recherche-et-innovation/cre/ (Accessed: 16/12/2025)
[38] Website: https://www.elevate-her.eu/fr (Accessed: 16/12/2025)
[39] Website:https://w05.international.gc.ca/projectbrowser-banqueprojets/project-projet/details/P007464001?Lang=eng (Accessed: 16/12/2025)
[40] Website: https://mastercardfdn.org/en/partners/forum-for-african-women-educationalists-fawe/ (Accessed: 16/12/2025)
[41] Lettre de Politique Sectorielle de Développement 2025-2029 (Sector Development Policy Letter, 2025-2029), Ministry of Higher Education, Research and Innovation, January 2025. Website: https://mesrisenegal.sn/2025/03/11/lpsd-2025-2029-un-plan-strategique-pour-moderniser-lenseignement-superieur/ (Accessed: 16/12/2025)

2.5 Equal opportunities for females and young researchers in South Africa

South Africa's population of 60.4 million comprises 51.3% women[42]. With 36% of the population under 35 years and a median age of 28, the country has significant potential for developing its research workforce[43]. Women account for 45% of researchers in South Africa, achieving gender parity by UNESCO standards[44]. Female representation is strong at postgraduate level, with women comprising 58% of university enrolment and 42.3% of doctoral graduates[45]. However, disparities emerge at senior levels: women hold only 32.5% of professorships and represent 36% of NRF-rated researchers[46].

The National Research Foundation reports significant transformation progress, with women researchers increasing from 37% to 45% between 2018-2023, and Black women rising from 15% to 35%[47]. Women received 41% of research funding in 2021, up from 36% in 2016[48]. In STEM fields specifically, women constitute 42.75% of graduates overall but only 30% in engineering and technology, and just 23% of employed STEM professionals[49].

Young researchers under 35 face challenges including heavy teaching loads, limited funding access, and publication pressure. Early-career women researchers experience higher attrition rates during this critical phase[50].

South Africa has established comprehensive support programs for women and young researchers. The South African Women in Science Awards (SAWiSA) annually recognises

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[42] World Bank. (2024). South Africa: Total population by gender. Website: https://www.statista.com/statistics/967928/total-population-of-south-africa-by-gender/(Accessed: 16/12/2025)

[43] South African Government. (2020). Young South Africans are set up for failure. Website: https://africasacountry.com/2020/03/are-young-south-africans-set-up-for-failure (Accessed: 16/12/2025)

[44] UNESCO. (2020). One in three researchers is a woman. Website: https://www.unesco.org/en/articles/one-three-researchers-woman (Accessed: 16/12/2025)

[45] DevelopmentAid. (2024). The status of women and girls in South Africa. Website: https://www.developmentaid.org/news-stream/post/176811/the-status-of-women-and-girls-in-south-africa (Accessed: 16/12/2025)

[46] University of Pretoria. (2019). UP actively boosts women professors and researchers. Website: https://mg.co.za/article/2019-08-08-00-up-actively-boosts-women-professors-and-researchers/(Accessed: 16/12/2025)

[47] National Research Foundation (NRF). (2024). Annual Report 2023/24. Website: https://pmg.org.za/committee-meeting/39626/ (Accessed: 16/12/2025)

[48] National Research Foundation (NRF). (2022). NRF advancing women in science. Website: https://www.nrf.ac.za/nrf-advancing-women-in-science/ (Accessed: 16/12/2025)

[49] South African Institute of Race Relations. (2024). Women in STEM statistics. Website: https://technogirltrust.co.za/technogirl-trust-empowering-women-in-stem-for-societal-development-2/ (Accessed: 16/12/2025)

[50] The Conversation. (2024). South Africa's young education researchers need networks. Website: https://theconversation.com/south-africas-young-education-researchers-need-networks-to-share-experience-more-than-pressure-to-produce-outputs-225709 (Accessed: 16/12/2025)

excellence among women researchers, with the 2025 theme "Unpacking STEM Careers: Her Voice in Science"[51].

The National Research Foundation's Thuthuka Programme allocates 61% of grants to women, while the Black Academics Advancement Programme supports emerging Black and female academics. Women now hold 45% (107 of 238) of prestigious SA Research Chairs[52]. The New Generation of Academics Programme (nGAP) and Nurturing Emerging Scholars Programme (NESP) recruit and mentor academics from underrepresented groups.

The TechnoGirl Programme has reached over 9,000 girls from disadvantaged communities since 2009, providing STEM job shadowing and mentorship from Grade 9. Of 2,000 participants who progressed to tertiary education, 90% pursue STEM careers[53]. The program secured R1.2 million annual corporate funding for bursaries[54].

Additional initiatives include the African Girls Can Code Initiative (coding bootcamps for girls 15-23), STEM MentHER Programme[55] (connecting Grade 12 girls with women professionals), and South African Young Academy of Science (SAYAS) for researchers under 40.

Non-governmental organisations like GirlCode ZA, WomEng, Black Women in Science (BWIS), and SAWISE provide networking, mentorship, and capacity-building. The L'Oréal-UNESCO For Women in Science Programme offers competitive grants to exceptional women PhD candidates and postdoctoral fellows.

2.6 Equal opportunities for females and young researchers in Tunisia

Based on recent demographic data from the National Institute of Statistics (INS) presented in the Flash Démographie – September 2025[56], Tunisia's population was recorded at approximately 11.85 million inhabitants in 2023. By 2024, the population structure reflected a slight female majority, with women comprising 50.7% of the total. The age profile indicates an ongoing demographic transition: 30.4% of the population is under 20 years of

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[51] Department of Science, Technology and Innovation (DSTI). (2025). South African Women in Science Awards Call. Website: https://uct.ac.za/sites/default/files/media/documents/uct_ac_za/87/internal-call-for-nominations-sawisa-2025.pdf (Accessed: 16/12/2025)

[52] National Research Foundation (NRF). (2020). NRF for women in field. Website: https://www.womeninscience.africa/nrf-for-women-in-field/ (Accessed: 16/12/2025)

[53] TechnoGirl Trust. (2024). Programme Impact Reports. Website: https://technogirltrust.co.za/ (Accessed: 16/12/2025)

[54] Brand South Africa. (2017). TechnoGirl: Educating girls, creating opportunity. Website: https://brandsouthafrica.com/71788/technology-innovations/technogirl-educating-girls-creating-opportunity/ (Accessed: 16/12/2025)

[55] Website: https://www.stemmenther.co.za/ (Accessed: 16/12/2025)

[56] Website: https://www.ins.tn/publication/flash-demographie (Accessed: 16/12/2025)

age, while 17% is aged 60 or above. The working-age population (15–59 years) constitutes 60.3% of the total.

Within this demographic context, women play a significant role in the national research system. They represent 59% of all personnel affiliated with research structures. Among teaching researchers, women account for 49% of the total, with a notably higher presence in "Corps B" (Assistant Professors) (57%) compared to "Corps A" (Professors and Associate Porfessors) (35%).

Their participation is even more pronounced in doctoral training, where female doctoral candidates represent 64% of total enrolments. In the 2021–2022 academic year, women also accounted for 67% of all defended PhD theses.

Young researchers, particularly doctoral candidates and post-doctoral fellows, form an essential component of Tunisia's research workforce. In the 2022–2023 academic year, a total of 10,559 doctoral candidates were enrolled.

With respect to research leadership, women's representation varies across different types of projects. In 2023[57], female leadership in national research programs ranged from 21% in the Federated Research Projects ("Projets de Recherche Fédérée - PRF") and **Program for the Encouragement of Scientific Excellence** (*Programme d'Encouragement à l'Excellence Scientifique* – PEES") instruments to 52% in the PEJC, a competitive national funding instrument.

In internationally collaborative projects in 2022, women led 50% of mixed international laboratories and 49% of multilateral projects, though this proportion fell to 15% for bilateral projects.

In summary, women constitute a vital segment of the research community in Tunisia, particularly as doctoral candidates and post-doctoral researchers. However, their representation in senior research roles and certain leadership positions remains limited. A concurrent decline in doctoral enrolments may pose challenges to the renewal of the national research workforce in the medium term, against a backdrop of a gradually aging population.

Definitions:

- **PEES:** *Programme d'Encouragement à l'Excellence Scientifique* **(Program for the Encouragement of Scientific Excellence).** This is a competitive national funding instrument aimed at supporting high-quality, excellence-driven research projects.

- **PRF**: *Projet de Recherche Fédérée* (Federated Research Project). This instrument likely funds larger, collaborative research projects that bring together multiple research teams or structures around a common scientific theme.

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[57] Website: https://pmo.ucar.rnu.tn/blog/call-3/the-booklet-key-figures-of-scientific-research-in-tunisia-2023-279 (Accessed: 16/12/2025)

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- **PEJC**: *Programme d'Encouragement des Jeunes Chercheurs* (Program for the Encouragement of Young Researchers). This is a competitive national funding scheme specifically designed to support early-career researchers in establishing their research activities.

Empowering females in Research in Tunisia

Tunisia has implemented several programs to promote the participation and leadership of women in science and technology:

- **Annual Prize from the Ministry of Family, Women, Children and Elder People:** This prestigious award is specifically dedicated to honouring the best research work on themes related to women, gender equality, family, and childhood. It provides national recognition and a platform for research that has a direct impact on social policy and development.
- **Other Recognitions:** Organisations like the **Tunisian Association of Digital Women (ATFN)** and private partners offer awards that recognise and reward the excellence of Tunisian women scientists across all disciplines. These prizes provide visibility, networking opportunities, and financial incentives.
- **Mentorship and Networking Programs:** Initiatives such as the **L'Oréal-UNESCO For Women in Science** program, while international, have a strong Tunisian presence. They provide fellowships, mentorship, and a powerful network for young female PhD students and post-docs, helping them navigate their early careers.

Supporting Young Researchers in Tunisia

To retain young talent and integrate them into the national research ecosystem, Tunisia offers specific funding and career development pathways.

- **"Encouragement for Young Researchers":** This is a cornerstone MESRS program. It provides a 3-year grant for doctoral students. This scheme offers financial support.
- **Mobility Grants (Bourses de Mobilité):** The MESRS and international cooperation programs fund short-term research stays abroad for PhD students and post-doctoral researchers. This allows young Tunisians to gain international exposure, access specialised equipment, and build collaborative networks without permanently leaving the country.

Young Researcher Support Program (cited above): This MESRS funding line is specifically dedicated to early-career researchers who have recently obtained their PhDs. It allows them to launch their first independent research projects, form their own teams, and build a scientific reputation, which is crucial for career progression.

3 The European context: Women in Digital in European Union

Despite many efforts at National and European level, and despite the Women in Digital Declaration, women still only represent around 1 in 5 ICT graduates and ICT specialists in the EU, with this distribution remaining stagnant for many years. Hence, it is important to address both the unequal representation in the ICT field and further comprehend the underlying causes allowing this challenge to persist.

The Declaration for Women in Digital[58] was signed in 2019 by the Member States and the partner states including Norway. 26 of the 27 EU member states have signed the declaration. The United Kingdom and Norway have also signed it and all these countries have committed to create a national strategy to encourage women's participation in ICT based on the following pillars:

- Encourage broadcasters to promote a positive public image of women in digital;
- Establish a European Girls and Women in ICT day;
- Stimulate companies to combat gender discrimination at work;
- Advance a gender-balanced composition of boards, committees and bodies dealing with digital matters;
- Improve monitoring mechanisms and data collection to set **improved** targets.

The Women in Digital (WiD) Scoreboard 2021[59] supports the WiD Declaration. Figure 1 shows a visualisation in the WiD scoreboard for all countries and Figure 2 shows as an example, the score for Finland, the country which is rankest highest.
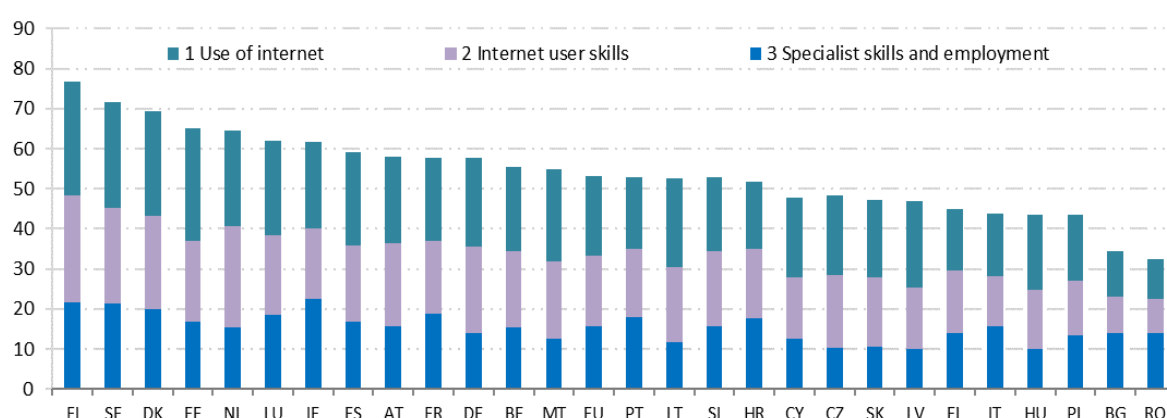

Figure 1: 2021 Women in Digital Scoreboard — ranking of Member States

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Gender gaps and challenges are prominent in the entire digital/ICT lifecycle. For instance, unequal female representation is a persistent, 'wicked' problem[60] along the entire pipeline, starting from the educational up to the occupational sector, often augmenting throughout the process as described by the well-known phenomenon of the 'leaky pipeline'. Gender gaps and challenges are even prominent in the scientific practices of ICT. For instance, with the rise of Artificial Intelligence (AI), research shows[61] that algorithms used by tech giants like Facebook and Amazon perpetuate sexism and racism in the labour market (on the basis of gender, race, religion, and other protected attributes), for instance ending up depicting women in feminised job roles in a stereotypical way. Similarly, Amazon's recruitment tool has been found to discriminate against women[62].

	Finland Women value	Finland rank	Finland Men value	EU Women value	EU Men
1 Use of internet					
1.1 Internet users % individuals, 2020	95%	3	95%	85%	87%
1.2 People who have never used the internet % individuals, 2020	1%	4	2%	10%	8%
1.3 Online banking % internet users, 2020	95%	2	95%	65%	67%
1.4 Doing an online course % internet users, 2020	31%	1	29%	15%	15%
1.5 Online consultations or voting % internet users, 2019	17%	3	14%	11%	12%
1.6 e-Government users % internet users submitting forms, 2020	91%	2	91%	64%	64%
1 Use of internet Score (0-100)	86	1		60	
2 Internet user skills					
2.1 At least basic digital skills % individuals, 2019	78%	1	75%	54%	58%
2.2 Above basic digital skills % individuals, 2019	50%	1	50%	29%	33%
2.3 At least basic software skills % individuals, 2019	78%	1	76%	56%	60%
2 Internet user skills Score (0-100)	80	1		53	
3 Specialist skills and employment					
3.1 STEM graduates Per 1000 individuals aged 20-29, 2019	14	11	35.1	14	28
3.2 ICT specialists % total employment, 2020	3.7%	1	11.2%	1.7%	6.5%
3.3 Unadjusted gender pay gap % difference in pay, 2019	13%	5		19%	
3 Specialist skills and employment Score (0-100)	65	2		47	
Women in Digital Index Score (0-100)	76.9	1		53.2	

Figure 2: Women in Digital Index for Finland.

As shown in the Figure 3 below, women are currently under-represented in this important sector, as in other areas of science, technology, engineering and maths (STEM).

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[60] Website: https://link.springer.com/article/10.1057/s42214-020-00054-w (Accessed: 16/12/2025)

[61] M. Ali, P. Sapiezynski, M. Bogen, A. Korolova, A. Mislove, and A. Rieke, "Discrimination through optimization: How facebook's ad delivery can lead to biased outcomes," Proceedings of the ACM on human-computer interaction, vol. 3, no. CSCW, pp. 1–30, 2019. Website: https://doi.org/10.1145/3359301(Accessed: 16/12/2025)

[62] J. Dastin, "Amazon scraps secret AI recruiting tool that showed bias against women," in Ethics of data and analytics, Auerbach Publications, 2022, pp. 296–299.
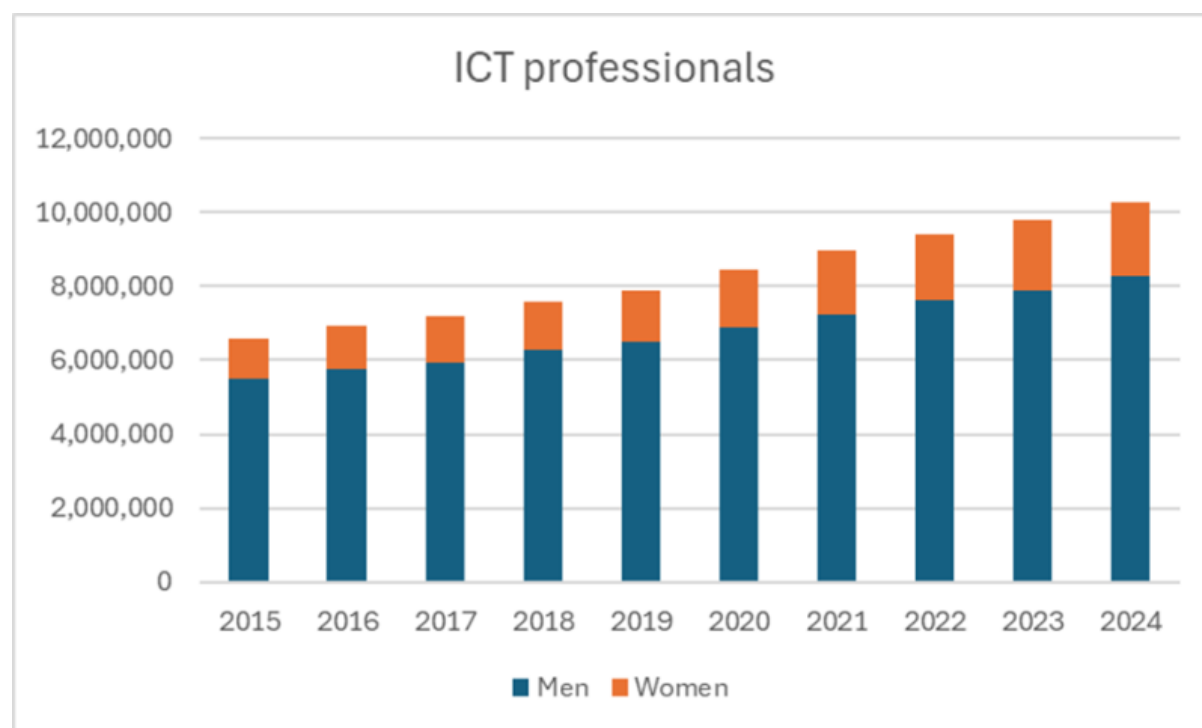
Figure 3: ICT professionals in Europe[63]

In the table below, we are briefly presenting the existing resources and platforms for promoting Women and Girls in Digital.

Table 1: A selection of existing resources and platforms for promoting Women and Girls in Digital

Resource	Description
Anita B.org Global initiative	The Grace Hopper Celebration of 2024 called ME + WE, is a testament to what's possible when women and non-binary technologists step boldly into their collective power. A power fuelled by the remarkable contributions, ambitions, and triumphs of every individual. "At GHC 24, you'll do more than join your community. You'll become part of an unstoppable force driving change in the tech industry and propelling us toward a future where the people who imagine and build technology mirror the people and societies for whom they build it". Website: https://ghc.anitab.org/ (Accessed: 16/12/2025).
Digital Decade Policy programme EU Initiative	The Digital Decade policy programme, with concrete targets and objectives for 2030, guides Europe's digital transformation and empowers businesses and people in a human-centred, sustainable and more prosperous digital future. The Digital Decade policy addresses

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	gender convergence in ICT skills and provides a structured, transparent and shared monitoring system based on the Digital Economy and Society Index (DESI). Website: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en (Accessed: 16/12/2025) Website: https://digital-decade-desi.digital-strategy.ec.europa.eu/ (Accessed: 16/12/2025)
Digital skills EU Initiative	The Digital Skills and Jobs Coalition tackles the digital skills gap by bringing together Member States, companies and organisations. Website: https://digital-strategy.ec.europa.eu/en/policies/digital-skills-coalition (Accessed: 16/12/2025)
ECWT European Centre for Women and Technology EU Initiative	The European Centre for Women and Technology (ECWT) is a European multi-stakeholder partnership of more than 130 organizations from all around Europe and not only. ECWT serves as a European single point of contact for information, collection and analysis of data, research, and the development of appropriate methodological tools to attract more girls to Science, Technology, Engineering and Mathematics (STEM), for nurturing and retaining women in the knowledge economy through industry and entrepreneurial careers, promoting the female talent to provide added value to ICT solutions, supporting more female ICT business start-ups and consolidating the largest network for closing the Digital Gender Gap in Europe. Website: https://ecwt.eu/ (Accessed: 16/12/2025)
OECD toolkit Global initiative	The OECD (Organisation for Economic Co-operation and Development) toolkit is collection of resources, guidelines, and methodologies developed by the OECD to assist governments, policymakers, and stakeholders in various areas of economic and social policy. It contains Resources for promoting gender equality and women's empowerment across different sectors and policy areas. Website: https://goingdigital.oecd.org/ (Accessed: 16/12/2025)
Women in Digital strategy EU Initiative	The Commission's Women in Digital strategy focuses on encouraging and empowering women to play a more active role in the digital age. Women's involvement and active participation is indispensable for a sustainable, fair and equitable economy and society. The strategy focuses on three areas: 1. Promoting digital skills and education; 2. Challenging digital gender stereotypes; 3. Advocating for more women entrepreneurs. Website: https://digital-strategy.ec.europa.eu/en/library/women-digital (Accessed: 16/12/2025)
EIGE EU Initiative	EIGE is an independent centre and the primary source for information on gender equality in the European Union. They contribute to making the European Union become a Union of Equality, where women and

	men, girls and boys in all their diversity are free to pursue their chosen path in life, have equal opportunities to thrive, and can equally participate in and lead our societies. In the context of Europe 2020 Strategy and in particular of the implementation of the Digital Agenda for Europe, the objective of the Women & Girls Go Digital Conference is to demonstrate the link between e-Skills, Gender Diversity and ICT as a key factor for economic growth based on the creation of digital jobs. The Conference addresses the digital skills gap and will raise awareness about the added value by including female talent in digital jobs, research and innovation. The Conference also addresses the digital skills gap and raises awareness about the added value of Including female talent in digital jobs, research and innovation. Website: https://eige.europa.eu/newsroom/events/women-girls-go-digital?language_content_entity=en (Accessed: 16/12/2025)
EU STEM Coalition EU Initiative	EU STEM Coalition is the EU's main network of national STEM platforms. Their aim is to shape STEM education policies and practices that foster economic growth, opportunity and well-being for all. Together with policy makers, education providers and industry, the EU STEM Coalition works on promoting new ways of delivering education and finding and sharing evidence-based solutions to skills mismatch in STEM. From reducing shortages of STEM skilled people to fostering new ways in which educational institutions, companies and governments can cooperate, they provide a unique forum and knowledge hub for data and analysis, best-practice sharing and direct support. Website: https://www.stemcoalition.eu (Accessed: 16/12/2025)
EITED (EU Initiative)	European Institute for Technologies, Education and Digitalisation (EITED) encourages the implementation and dissemination of modern educational programs and projects in accordance with the best practices, standards and technologies, designs and conducts training and do scientific research and innovation activity and participates and encourages the involvement of civil society in the creation of innovations and interdisciplinary projects related to technologies, education, digitalisation, and science. Website: https://eited.org/ (Accessed: 16/12/2025)
GENDER Portal EU Initiative	GenPORT is a community sourced Internet Portal on gender and science. The portal offers the chance to contribute with your own resources or resources by others that might be relevant for the community. GenPORT is funded by the European Union. Website: https://www.genderportal.eu/resources/women-digital-age-eu-report (Accessed: 16/12/2025)
Girls in Digital Global initiative	Harnessing the power of collective action, the UNGEI partnership is on a mission to close the gender gap in education and unlock its transformative power for every girl, everywhere. The Digital

	Empowerment of Girls publication provides recommendations for closing the digital gender gap that will enable girls to participate in and contribute to our increasingly digital future. Website: https://www.ungei.org/publication/digital-empowerment-girls (Accessed: 16/12/2025)
Gendex project EU Initiative	*Gendex - Gender and Diversity Index for a fair, competitive, resilient and sustainable Europe* is an EIC project providing consistent information to startups, scaleups, corporates, the EIC, other investors and funding bodies, market actors and policy makers across Europe to increase the visibility of female talent. It develops a Gender & Diversity including a wide range of indicators related to gender and diversity factors covering all Member States as well as the U.K. Any relevant date about females in the digital sector will be employed. Website: https://eurogendex.org/ (Accessed: 16/12/2025)
ITU Global initiative	ITU is the United Nations specialized agency for information and communication technologies (ICTs). The Organization is made up of a membership of 193 Member States and more than 1000 companies, universities and international and regional organizations. ITU acts in many areas including gender equality for supporting women and men in ICTs. It promotes different initiatives such as ITU's "Network of Women" (NoW) communities, International Girls in ICT, The ITU-D Women in Cyber programme. It is also responsible for the collection and report of data from ICT indicators related to individuals accessing and using ICTs (ITU GENDER DASHBOARD). Website: https://www.itu.int/en/action/gender-equality/Pages/default.aspx (Accessed: 16/12/2025) Website: https://www.itu.int/en/mediacentre/backgrounders/Pages/bridging-the-gender-divide.aspx (Accessed: 16/12/2025)
OECD Gender Initiative Global initiative	The OECD Gender Initiative examines existing barriers to gender equality in education, employment, and entrepreneurship. The website monitors the progress made by governments to promote gender equality in both OECD and non-OECD countries and provides good practices based on analytical tools and reliable data. OECD is responsible for the production of several reports on the equitable participation of women in the digital economy. Website: https://www.oecd.org/gender/data/women-in-the-digital-era-internet-use-and-skills-at-work.htm (Accessed: 16/12/2025) Website: https://www.oecd.org/digital/bridging-the-digital-gender-divide.pdf (Accessed: 16/12/2025)
UNICEF Global initiative	The UNICEF blog "The Digital World: What about girls?" discusses the gender digital divide in East Asia and the Pacific, highlighting that girls are less likely than boys to access and use digital technology. This is

	due to gender norms, lack of access to devices, and educational barriers. The blog stresses the need for policies and programs to support girls' digital literacy and empower them in the digital age. It also showcases initiatives where UNICEF collaborates with partners to provide digital learning tools and support for girls. Website: https://www.unicef.org/eap/blog/digital-world-what-about-girls (Accessed: 16/12/2025)
UNWomen Global initiative	The "Statement: Digital Skills for Life" by UN Women, delivered by Executive Director Sima Bahous, emphasizes the importance of digital literacy, online safety, and cybersecurity skills for girls. It highlights the need for equitable and inclusive education to bridge the gender digital divide, combating stereotypes and ensuring safe digital environments. The statement also addresses the economic impact of digital skill gaps and the necessity of protecting girls from online harassment. It calls for collaborative efforts to empower girls as active digital citizens. Website: https://www.unwomen.org/en/news-stories/statement/2023/04/statement-digital-skills-for-life (Accessed: 16/12/2025)
Women in Digital (WiD) Scoreboard EU Initiative	The Women in Digital (WiD) Scoreboard is part of the Digital Economy and Society Index (DESI) and has been implemented to monitor progress of EU members. The scorecard assesses Member States' performance in twelve areas, including internet use, digital skills, specialist skills, and employment. Website: https://digital-strategy.ec.europa.eu/en/news/women-digital-scoreboard-2021 (Accessed: 16/12/2025)
Women Who Code Global initiative	The vision of Women Who Code is creating a tech industry where diverse women and historically excluded people thrive at every level. They empower with skills needed for professional achievement, build a global community where networking and mentorship is valued, educate companies to better promote, retain and hire talented women, and develop role models and support this generation of engineers. Website: https://womenwhocode.com/about (Accessed: 16/12/2025)

The challenge for Europe is that we need more girls and women in ICT for different reasons.

- **Europe's competitiveness**: if Europe increases the share of women working in ICT to about 45% by 2027, this will boost GDP significantly – estimates vary from EUR 260 to 600 billion. This will lead to a more competitive and prosperous Europe for all.

- **Equal opportunities**: everyone in Europe should be able to thrive in the digital world, no matter their background.

- **Highly skilled workforce**: Europe needs more people in ICT jobs to overcome the strategic shortage of workers with advanced digital skills. The Digital Decade target

is to increase the number of ICT professionals in Europe from 10.3 million in 2024 to 20 million by 2030.

- **Diversity for innovation**: more diverse and gender-balanced teams are likely to produce better, fairer and more inclusive digital technology and solutions.

4 DIGITAfrica survey

The overarching goal of DIGITAfrica is to lay the foundations for a pan-African comprehensive Research Infrastructure (RI) in Digital Sciences. DIGITAfrica needs to effectively identify priority digital skill needs for developing micro-credits, particularly for young graduates and women, distinct questionnaires are essential for university staff (course developers) and students.

DIGITAfrica organised a survey to collect the digital skills needs from professors[64] and students[65] from the African participating countries (Cameroon, Kenya, Senegal, South Africa, Tunisia), arranged into five regions (Central Africa, East Africa, West Africa, South Africa, and North Africa). This survey was carried out from 15th September 2025 to 20th November 2025. The survey was conducted using Google forms; participants were contacted by emails sent to mailing lists of universities. More than 1500 students and more than 200 professors were contacted; they were invited to access a link to the Google form. At the point of invitation, there was no distinction between invitation sent to male or female potential participants. The survey for professors comprised two forms: one in English and the other in French. The same applied to the survey for students. The English form targeted participants in Kenya and South Africa, while the French form targeted participants from Cameroon, Senegal, and Tunisia. The student survey had a section that required responses from female students and researchers only. Both surveys had sections seeking information about female students and researchers.

Responses from students and young researchers from the English and French forms were merged and analysed. The same was done for responses from professors on the English and French Google forms.

The objective of the survey for the professors was to understand the current digital skills landscape within university curricula, identify perceived gaps in graduates' digital competencies, assess the digital skill needs of course developers themselves, and gather insights on integrating new digital skills into teaching materials.

The objective of the survey for the students was to assess students' current digital skill proficiency, identify their perceived digital skill needs for future employment, understand

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[64] Survey title: "DIGITAfrica Project: Digital Skills Needs Assessment for University Curricula - Professors/Lecturers"
[65] Survey title: "DIGITAfrica Project: Digital Skills Needs Assessment for University Curricula - Students and Graduates"

their interest in specific digital technologies, and gauge their preferred learning modalities for acquiring new skills. This questionnaire should specifically target young graduates and female students where possible through sampling or screening questions.

While DIGITAfrica organised the above survey, specific questions tried to address the participation of female and young researchers in digital sciences education and activities. The results of the survey are listed below:

Responders:

- Professors/Lecturers/Researchers – **24 responses**

- Students and graduates – **48 responses**

Gender of the professor responders

In the following diagram, the gender distribution of the professor respondents is depicted. It is clearly shown that there are fewer female professors and researchers, which indicates the **under-representation of female academics and researchers**.
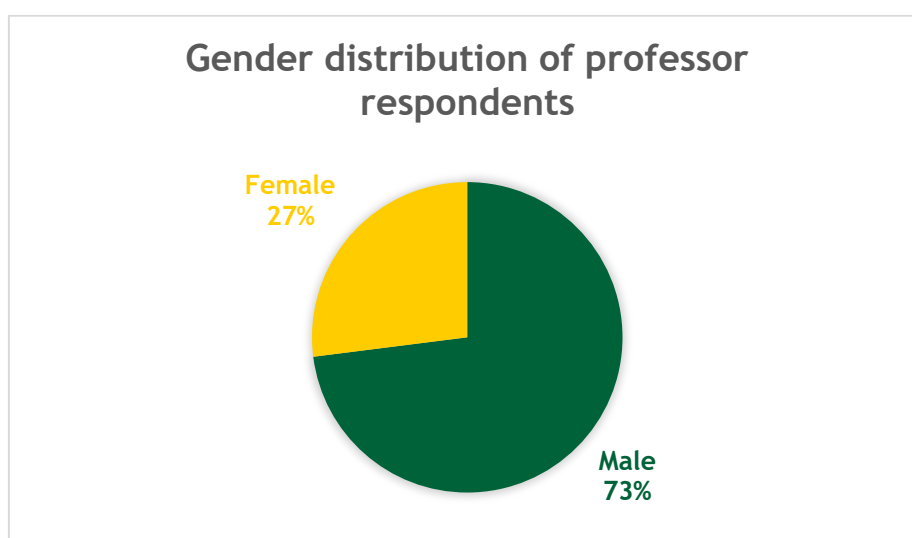

Figure 4: Gender distribution of the professor respondents

Gender of the student responders

In the following diagram, the gender distribution of student respondents is depicted. The female participation is less; however, the results are higher than the ones in the professor respondents.

D4.1 Guidelines female and young researchers

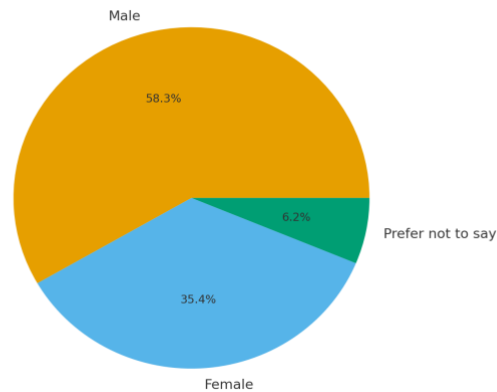Gender Distribution of Student Respondents

Figure 5: Gender distribution of student respondents

The challenges that **Female Face during Digital Science Skills Development** are listed below, as reported from the **professor** respondents:

- Lack of **mentors and role models;**

- **Unconscious Bias** in Academic and Hiring Processes;

- Limited **Confidence and Self-Efficacy** in Technical Domains;

- **Safety Concerns and Restricted Mobility;**

- **Sociocultural Expectations and Work–Life Balance** Pressures.

Female professor Respondents on critical digital skills:

- Emphasize **Cybersecurity**, **AI/ML**, **Cloud**, and **Data Science;**

- Strong interest in **digital entrepreneurship** and **critical thinking;**

- Concerned about women's limited access to advanced tech training.

Male professor Respondents:

- Highlight **AI/ML, Cloud, Data Science, Big Data;**

- More mentions of classic software development and telecom.

Key Insights for Female Students:

- Female representation is **significant** but still **below parity;**

- They possess strong foundational digital skills but **lower confidence in advanced technical domains;**

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- They experience unique barriers: **mentorship gaps, cost, confidence, and gender bias**;

- They show **high motivation** for digital upskilling and strong interest in **certified micro-credentials**;

- Female students prioritise **structured, guided learning**, especially in high-demand fields such as analytics, cybersecurity, cloud, and UI/UX;

- There is a clear need for **targeted support programs** to improve equity in advanced digital skills.

5 DIGITAfrica guidelines, recommendations and actions towards the empowerment of female and young researchers

In this section, we will discuss the different measures that DIGITAfrica could propose to improve the situation in the African countries, including the processes and the proposed actions.

DIGITAfrica identified the following sectors that intervention needed in order to support new opportunities for females and young researchers. Those recommendations are aligned with the eligibility criterions in Horizon Europe for the Gender Equality Plans[66]. The 4-eligibility criterion for the GEP are:

- PUBLICATION a formal document published on the institution's website and signed by the top management.

- DEDICATED RESOURCES a commitment of resources and expertise in gender equality to implement the plan.

- DATA COLLECTION & MONITORING sex/gender disaggregated data on personnel (and students, for the establishments concerned) and annual reporting based on indicators.

- TRAINING awareness-raising/ training on gender equality and unconscious gender biases for staff and decision-makers.

The GEP should cover 5 thematic areas:

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[66] Website: https://op.europa.eu/en/publication-detail/-/publication/872aa50c-a7ea-11f0-a7c5-01aa75ed71a1/language-en (Accessed: 19/12/2025)

D4.1 Guidelines female and young researchers

1. Work-life balance and organisational culture.

2. Gender balance in leadership and decision-making.

3. Gender equality in recruitment and career progression.

4. Integration of the gender dimension into research and teaching content.

5. Measures against gender-based violence, including sexual harassment.

5.1 Access and infrastructure

One of the sectors that intervention needed is the one of Access and Infrastructure. The recommendations under this sector are listed below:

- **Facilitate access and connectivity to digital technologies** by females and young researchers, focusing on affordability, safety and security, and availability of gender-responsive and age-appropriate content and services.

- **Encourage collaboration** between research and industry that can support the deployment of networks and expand access through joint initiatives.

- **Adapt national strategies** to promote access to technology in rural and underserved areas – African national governments should work on increasing internet connectivity in remote and underserved areas.

5.2 Education and skills development

For the sector of Education and skills development, the identified recommendations are listed below:

- Training activities that DIGITAfrica organises, including the Hackathons, the workshops, the summer schools. It is important to ensure the **participation of females and young researchers** in such activities.

- Workshops, events and hackathons that DIGITAfrica organises in different African and EU countries, to help females and young researchers **improve their digital skills** and be more confident in using them to take opportunities, innovate and create value for society

- Offer Scholarships and Grants for females and young researchers: **financial support** in the form of scholarships and grants for females and young researchers pursuing degrees in STEM fields can be a significant enabler. By lowering the financial barriers to education in technology-related disciplines, their participation in digital sciences can be boosted. Additionally, offering postgraduate scholarships can encourage females and young researchers to pursue research opportunities and advanced degrees.

D4.1 Guidelines female and young researchers

- Continue rolling out capacity and digital skills **building projects for females and young researchers**. Training and educational programmes should address stereotypes and target existing gender biases. **Develop curricula** that encourages greater female involvement in STEM studies and, more generally, bridges the gender skills divide in the digital transformation era.

5.3 Policies and governance

For the sector of Policies and Governance, the identified recommendations are listed below:

- Awareness of the DIGITAfrica results in different **education stakeholders** in the whole of Africa region presenting the good practice generated though the project.

- **Work with communities** to support enhancement of the digital skills for females and young researchers, raising awareness about the potential of technology to benefit their careers and lives.

- Design engendered **digital strategies and policies**: policy makers at both regional level and country level should take cognisance of the unique needs of females, value their perspectives and experiences, and intentionally consider them when designing, implementing and measuring digital transformation programmes, strategies and policies.

- Advocate for **policy changes at the Governmental Level**: governmental policy plays a pivotal role in shaping the tech industry's gender diversity. Advocating for policies that support women and young researchers in science and technology, such as funding for women-led tech startups, tax incentives for companies with diverse R&D teams, and mandatory gender diversity reporting, can help accelerate change.

5.4 Support and empowerment

For the sector of Support and Empowerment, the identified recommendations are listed below:

- **Create safe digital learning environments** through comprehensive multi-sectoral approaches, from addressing gaps in policies and laws around privacy, safety, and security to developing mechanisms to prevent and respond to gender-based violence in digital learning environments.

- **Establish Mentorship and Networking Programs**: Mentorship programs that pair emerging tech talents with experienced professionals can foster skill development and career growth. Networking events and communities specifically for women and young researchers in tech R&D can also provide valuable support systems, enabling women to connect, share experiences, and foster professional relationships.

D4.1 Guidelines female and young researchers

- **Implement Bias-Free Performance Evaluations**: To ensure women and young researchers have equal opportunities for advancement in tech R&D, organisations must adopt bias-free performance evaluation practices. This includes training evaluators to recognize and mitigate their biases, using objective criteria for assessing performance, and ensuring transparency in the evaluation process.

- **Encourage Open Dialogue and Awareness**: Fostering an environment where women and young researchers can openly discuss gender diversity and inclusion issues is vital. Workshops, seminars, and awareness campaigns can help educate all employees about the challenges females face in tech and the importance of diversity in fostering innovation. This openness can contribute to a more supportive and inclusive tech ecosystem, encouraging more females to join and stay in the tech R&D sector.

6 Conclusions

The deliverable confirms the existence and persistence of the gender digital divide in Africa as a continent and within individual African states. Although the gender digital divide is not only in Africa, there is still a need to address it. As discussed, there is a need for intervention (policy, legislative, institutional and structural) to address core causes of gender inequalities.

The deliverable prepared recommendations in terms of practical challenges within the following levels:

- Access and infrastructure
- Education and skills development
- Policies and government
- Continuous support and empowerment

DIGITAfrica will undertake specific measures as mentioned, to empower females and young researchers towards their participation in digital sciences and eventually towards the Digital transformation of Africa.