

ERF Policy Brief

Information and Communication Technology in the Workplace in Egypt: An Opportunity for Strengthening the Labor Market

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In a nutshell

- Around two-fifths of the workforce in Egypt used computers at work or the internet for work purposes via mobile and inter-connected devices in 2023.
- There has been a shift toward mobile and internet-reliant technologies across the workforce, reflecting broader changes in the digital landscape from 2012 to 2023.
- The use of computers and the internet is much more common in formal jobs, namely the public sector and formal private sector wage employment. However, it has also spread among own-account workers who experienced a marked increase in their computer and internet usage by 2023.
- Women's use of computers at work and the internet for work purposes is more than men, primarily due to their higher representation in formal jobs. Additionally, within formal jobs, women used computers and the internet more than their male peers.
- Women in the labor force are more likely than men to have strong or very strong computer skills, with unemployed women leading in computer proficiency, reflecting that unemployment primarily affects the educated, especially educated women in Egypt.
- Promoting formal opportunities of employment hinges on untapping the potential of computer skills in the Egyptian labor force through investments in digital-intensive sectors and supporting digital entrepreneurship.

This policy brief discusses technology adoption in Egypt's labor market by analyzing trends by employment type and gender using nationally representative data from the Egypt Labor Market Panel Surveys (ELMPS) between 2012 and 2023 (OAMDI, 2019, 2020, 2024). This brief is based on the results of Yasser, Selwaness, and Poggi (2024).

We acknowledge the financial support of the International Labour Organization through the Government of the Netherlands and the Swedish International Development Cooperation Agency, the World Bank Poverty and Equity Global Practice supported by the UK-funded Strategic Partnership for Egypt's Inclusive Growth trust fund (SPEIG TF), and World Bank MENA Chief Economist office, Agence Française de Développement (AFD), Ministry of Planning, Economic Development and International Cooperation, Egypt, and UNICEF for the Egypt Labor Market Panel Survey 2023, on which this policy brief is based.

Technology usage trends

Technology usage in the workplace is captured through three modalities: (1) using a computer without internet, (2) using a computer with internet, and (3) using the internet for work via mobile or interconnected devices (e.g., smartphone, laptop, or tablet). From 2012 to 2023, computer and internet usage among employed individuals remained relatively stable, fluctuating between 20 percent and 21 percent, with a dip in 2018 to 17 percent. The sectoral analysis of technology usage shows that the highest rates of technology adoption were found in the information and communication technology (ICT), real estate activities, and financial services sectors, where around three-quarters (73-76 percent) of workers in these sectors used computers or the internet by 2023 (see Yasser, Selwaness, and Poggi (2024)). Sectors such as agriculture, construction, and transport had the lowest information technology adoption. This sectoral divide helps explain the dip in overall technology use between 2012 and 2018, as sectors with lower information technology adoption grew during that time (Assaad et al., 2022).

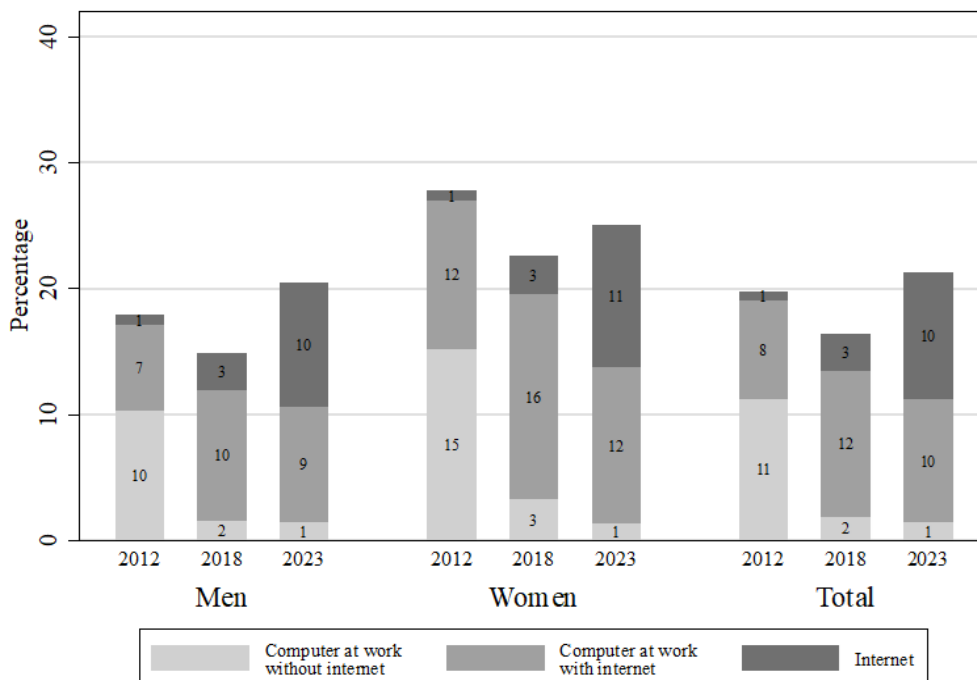
Over the years, there was a shift away from using non-internet-connected computers to more mobile and internet-connected devices (such as smartphones, tablets, or laptops). By 2023, internet access through mobile devices had surged, signaling a substantial shift toward multi-device internet usage.

Women consistently use computers or the internet for work more than men, largely due to their higher representation in public sector and formal private sector jobs (Assaad and Mahmoud, 2024), which tend to use digital technology more than other jobs.

Technology usage in public sector and formal private sector jobs was consistently the highest over time (Figure 2). For instance, 39 percent of public sector workers used computers at work or the internet for work purposes in 2023 (up from 33 percent in 2012) compared to 43 percent of formal private sector wage workers (up from 36 percent in 2012). In contrast, informal wage workers and non-wage workers (employers, own-account workers, and unpaid family workers) had much lower rates of technology usage. The lowest rate of computer and internet usage was among unpaid family workers (three percent in 2023), followed by informal wage workers outside of fixed establishments (six percent in 2023).

Within employment types, there have been some dynamic patterns in computer and internet usage over time. For example, although employers and self-employed workers had much lower rates of technology usage compared to public sector and formal private sector wage workers, they experienced a marked increase in their technology adoption over time, with usage nearly doubling from 12 percent in 2012 to 21 percent 2023 for employers and from nine percent to

Figure 1. Proportion of workers using technology for work by sex in 2012, 2018, and 2023, ages 15-64



Source: Authors' calculations based on the ELMPS 2012, 2018, and 2023.



12 percent among self-employed workers over the same period (Figure 2). This rise in technology usage among employers is primarily driven by using the internet for work purposes via mobile devices, rather than the use of desktop computers at work. This result highlights that technology usage is spread to other types of employment where it was not previously used or required.

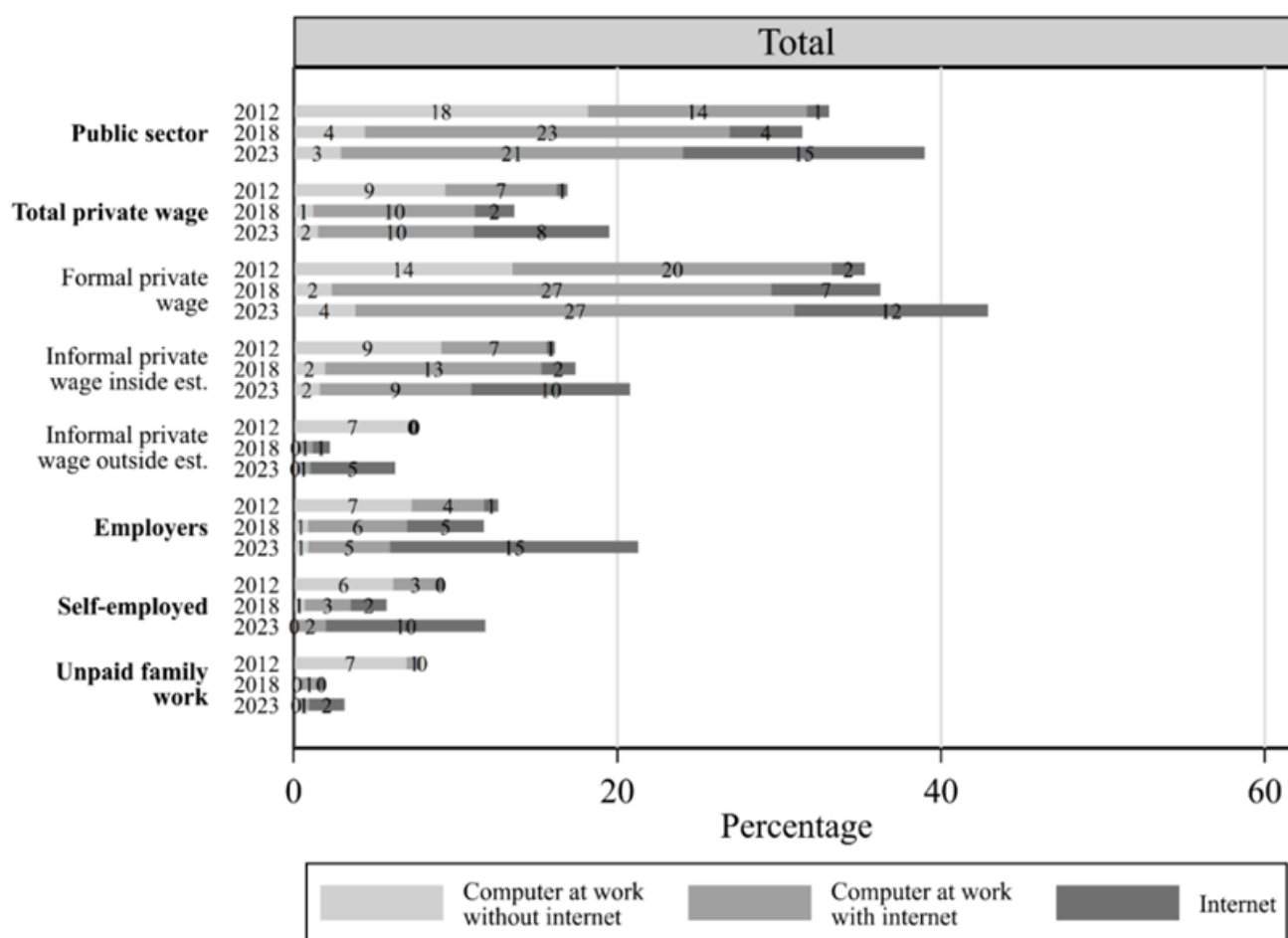
Within the same types of employment, there is a consistent trend favoring women in technology usage. Women are more likely than men to use computers and the internet, particularly in the public sector and formal private sector wage work. In 2023, more than half (54 percent) of formal female wage workers used technology compared to 42 percent of men. The gap, however, was much larger in previous years, particularly in 2012 and 2018, which means that men relatively caught up with women in using computers

and the internet by 2023 (see Yasser, Selwaness, and Poggi (2024) for further details).

Digital-intensive occupations

Top occupations (at the three-digit level) leading in internet usage included electrotechnology engineers, business service and administration managers, engineering professionals, finance professionals, and client information services (Figure 3). For women, the top occupations leading in technology adoption were ‘other health professionals’ (namely pharmacists), client information service, and finance professionals. It is important to note that most of these top occupations are classified as ICT specialists or ICT task-intensive jobs according to the Organisation for Economic Co-operation and Development (OECD) measure of defining digital tasks (ILO, 2023a).

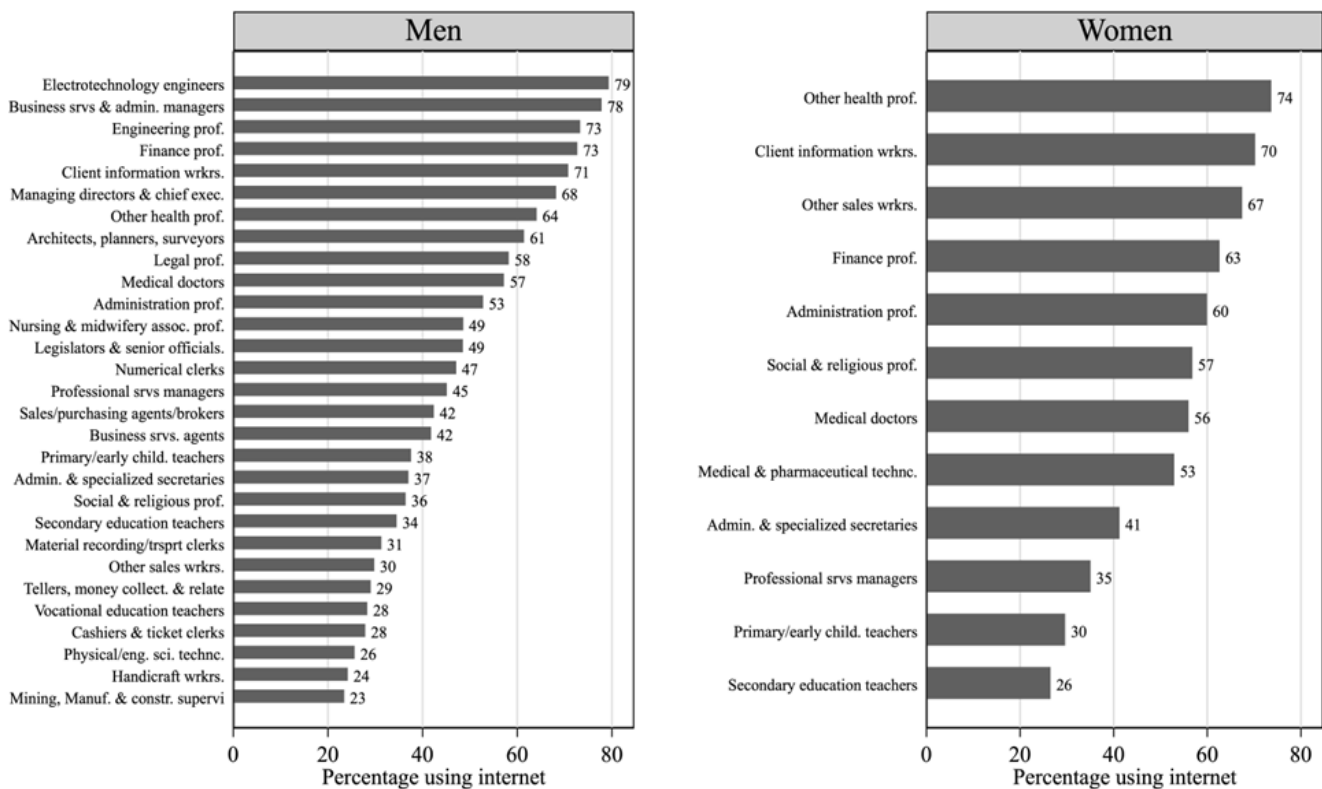
Figure 2. Proportion of workers using technology for work by type of employment and by sex in 2012, 2018, and 2023, ages 15-64



Source: Constructed by authors using the ELMPS 2012, 2018, and 2023.



Figure 3. Occupations at the three-digit level with the highest proportion of workers using internet-connected devices in 2023 by sex, ages 15-64



Source: Authors' calculations based on the ELMPS 2023. Notes: The figure shows occupations at the three-digit level with a sample size of 30 observations or more, and with higher-than-average internet usage for men and women, respectively.

Digital-intensive sectors

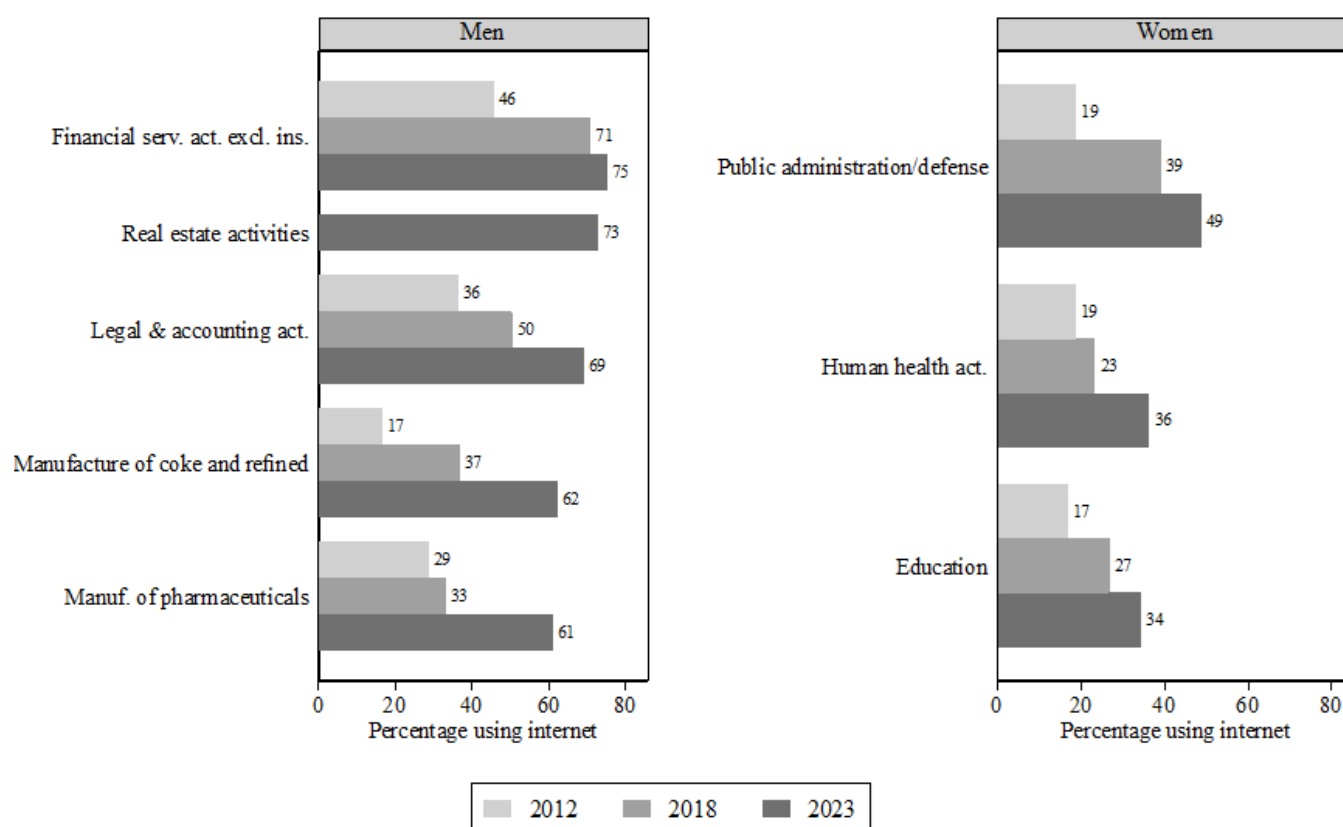
The top five economic sectors in the use of internet-connected devices were: (1) financial services (excluding insurance activities), echoing with finance professionals being one of the top occupations in internet usage in 2023 (Figure 4); (2) real estate activities; (3) legal and accounting activities; (4) manufacture of coke and refined petroleum; and (5) manufacture of pharmaceuticals. The manufacture of pharmaceuticals as a leading industry in internet usage is also in line with 'other health professionals' (namely pharmacists) being one of the top occupations with the highest internet usage.

The top economic sectors for women were quite different from men, reflecting gendered employment patterns, and women's sectoral concentration. For instance, 'public administration and defense,' 'human health and social work activities,' and 'education' were among the leading sectors in internet usage for women.

'Repair of computer, personal, and household goods,' 'other personal service activities,' and 'education' were among the top economic sectors among own-account workers. The rise in internet usage among male employers and self-employed workers was mainly driven by growth in the 'repair of computer, personal, and household goods' sector, where usage rose from 13 percent in 2012 to 42 percent in 2023. Another rapidly growing sector was 'other personal service activities,' with internet use increasing from four percent to 22 percent over the same period. For female employers and self-employed workers, the top sector was education, with 26 percent using the internet in 2023. This is a trend that is closely linked to the rise of online schooling or private tutoring roles among women from 2018 to 2023. This shift toward digital technology in education reflects a larger pattern observed during the COVID-19 pandemic, where women—especially teachers—were at the forefront of remote work: Although only a small portion of the workforce shifted to remote work, female educators led this change (see Yasser, Selwaness, and Poggi (2024) for more details).



Figure 4. Sectors of economic activity (at the two-digit level) with the highest proportion of workers using the internet for work in 2023 by sex, ages 15-64



Source: Authors' calculations based on the ELMPS 2012, 2018, and 2023. Notes: The figure shows industries at the two-digit level with a sample size of 30 observations or more, and with higher-than-average internet usage for men and women, respectively.

Computer skills in the labor market

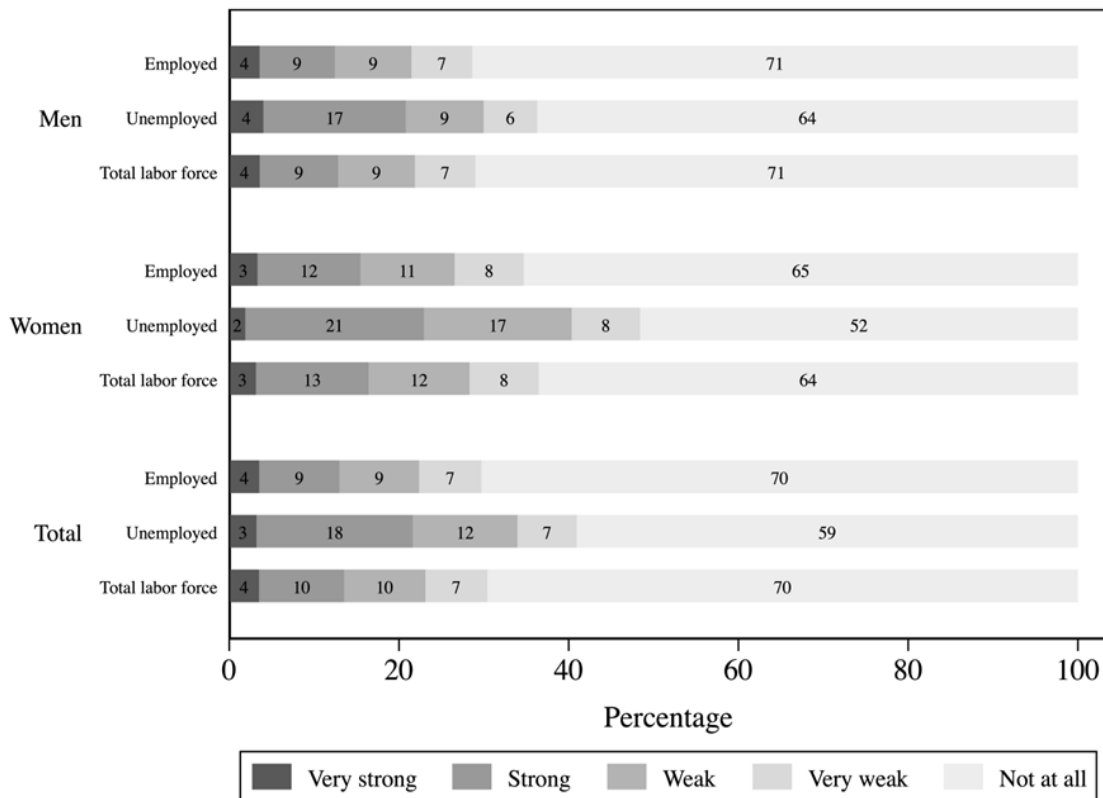
Employed women not only used computers and the internet more than men, but they were also more likely to report having strong or very strong computer skills. The ELMPS 2023 included two sets of questions on computer skills. The first is about individuals' subjective perception of their level of computer skills (using a five-point Likert scale). This question was administered to all respondents, which made possible the comparison of the distribution of computer skills between employed and unemployed individuals who are actively searching for a job. The second is whether individuals' jobs require computer skills. This made possible the comparison between self-assessment of one's own computer skill and the requirement for computer skills in their jobs.

Using questions on self-reporting of computer skills, 15 percent of employed women had strong or very strong computer skills, versus 13 percent of employed men (Figure 5). Importantly, the highest rate of strong or very strong skills was observed among unemployed women, at 23 percent, which is 1.5 times that among

employed women (15 percent). Likewise, unemployed men were more likely to have strong or very strong skills (21 percent) relative to their employed peers (15 percent). This highlights a well-known phenomenon in the Egyptian labor market, where unemployment primarily affects educated workers in Egypt, particularly educated women (Assaad et al., 2020; Krafft et al., 2024). The higher prevalence of computer skills among unemployed women also contributes to further understanding why women's unemployment is high. The retrenchment of formal jobs—whether in the public or private sectors, which are intensive in technology usage—limits the job opportunities matching those higher computer skills among unemployed women.

However, job requirements for computer skills are declining. Around 12 percent of the currently employed worked in jobs requiring computer skills in 2023 (Figure 6). This matches the share of workers (13 percent) who self-reported proficiency in computer skills (in Figure 5). There was, however, a surprising downward trend in the percentage of workers in jobs requiring computer skills, dropping to 12 percent in 2023 after increasing from 15 percent in 2012 to 18 percent in 2018. This is a counter-

Figure 5. Distribution (in percentage) of levels of computer skills by sex, among the labor force (standard definition), ages 15-64



Source: Authors' calculations based on the ELMPS 2023.

intuitive result of the rise in computers and internet usage between 2018 and 2023. This finding is probably due to the contraction of public sector employment and the stagnation of formal employment, both of which are digital-intensive. It also highlights that computer skills as a collective are diverse and dynamic. It is likely that the declining requirement of computer skills reflects the decline in the use of desktop computers at work, but that new forms of technology have spread, such as using the internet through mobile devices, or the use of more evolving skills such as Artificial Intelligence (AI). In addition, other types of employment that do not essentially require computer skills have also expanded, such as own-account work, with the number of employers growing at 3.1 percent yearly and that of self-employed workers growing at 11.8 percent yearly (Assaad and Mahmoud, 2024). These two types of employment also saw their use of the internet for work purposes surging.

This evolving pattern of requirements for computer skills prompts further understanding of which types of computer skills are most required. Figure 7 shows that the use of spreadsheet skills, the use of electronic services, and the use of application interfaces were the most required computer skills, at 58 percent, 49

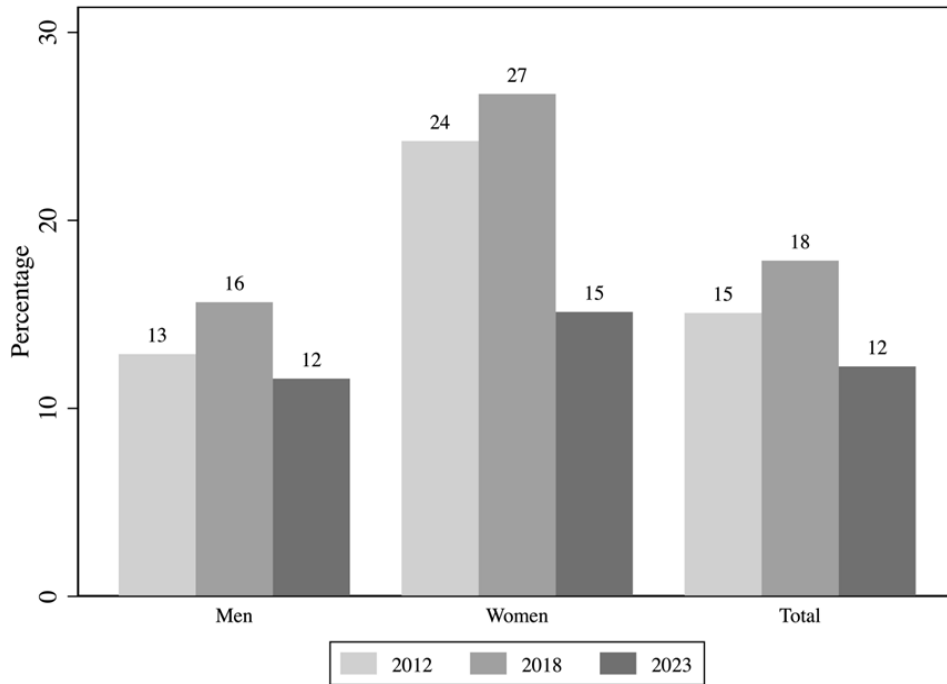
percent, and 47 percent of workers, respectively. It was not possible to examine the evolution of different types of computer skill requirements over time, because the questions on the type of computer skills required were new additions to the ELMPS 2023 questionnaire and were not available in the 2012 and 2018 versions. Therefore, it is not possible to determine the specific skills that jobs require less of over time and those that jobs require more of. This is an area of further research.

Work through digital platforms

The ELMPS 2023 wave included questions to detect the use of digital platforms for work among all employed individuals above the age of six, covering both primary and secondary jobs. The main question was: "Do you find work, opportunities, or gigs within this position through a digital platform or app, such as Upwork, Uber, Careem, Fixawy, Taskty, or similar?" Results show that only 0.4 percent of employed individuals use digital platforms for their primary job, predominantly through location-based services like Uber and Careem. For those with a secondary job, only 0.2 percent used a digital platform for their work.

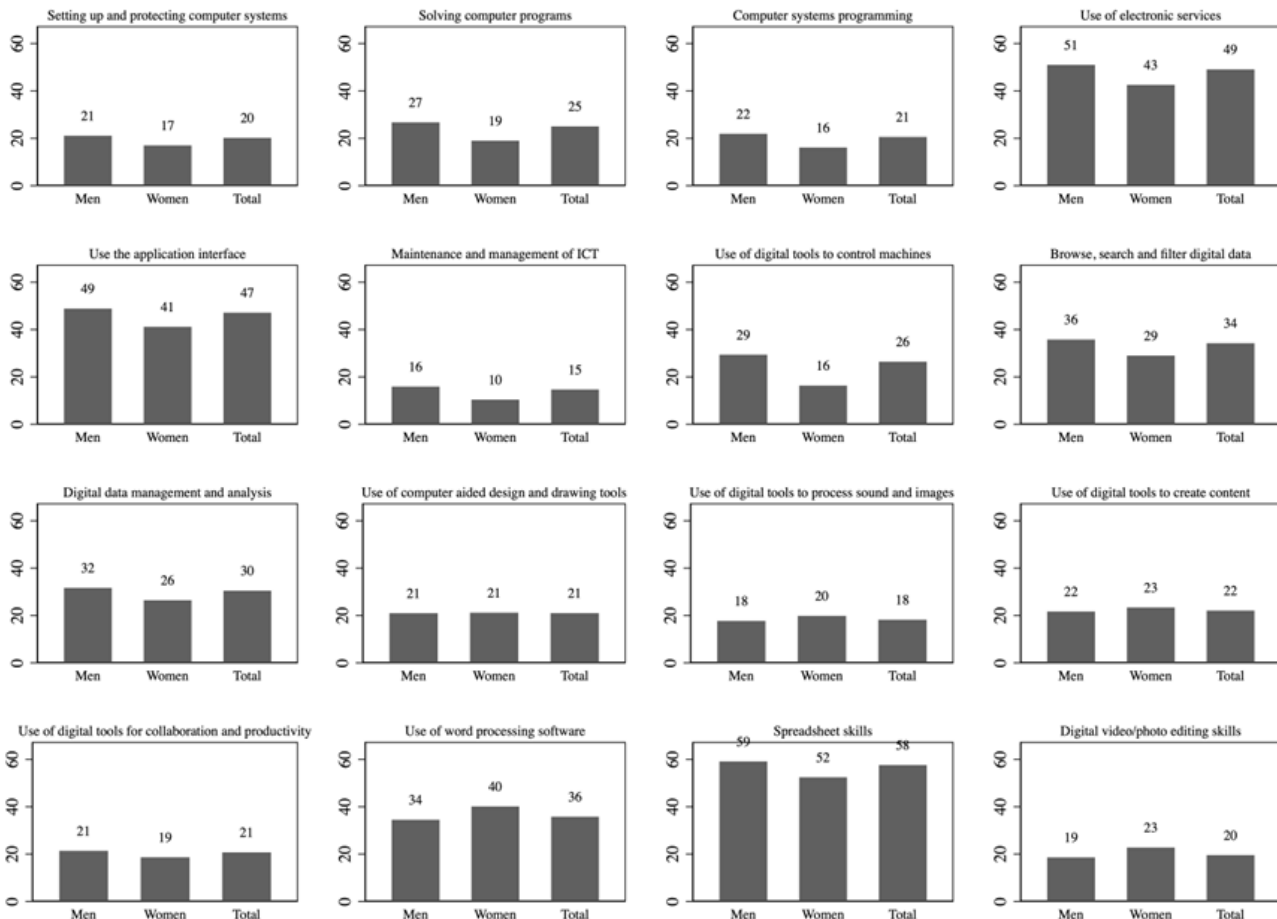


Figure 6. Percentage of workers in jobs requiring computer skills in 2012, 2018, and 2023 by sex, ages 15-64



Source: Authors' calculations based on the ELMPS 2012, 2018, and 2023.

Figure 7. Types of computer skills required by jobs (percentage of workers) by sex, among workers whose jobs require computer skills, 2023



Source: Authors' calculations based on the ELMPS 2023.



While digital platform work engagement remains low, about 11-14 percent of unemployed individuals showed interest and willingness to engage in gig-based work. However, this was less popular compared to preferences for public sector jobs (77 percent) or administrative assistant roles (63 percent), data entry (51 percent), and customer service (47).

Discussion and policy recommendations

Overall, these findings highlight a dynamic digital landscape in Egypt, characterized by a gradual increase in technology use across various employment types, a digital gender divide in favor of women, and potentially shifting digital skill demands. Policy and programs should focus on several areas, including but not limited to:

Unlocking the potential of computer skills in the labor force

Our findings highlight that the sectors most likely to rely on technology are also the most likely to provide formal jobs (i.e., those covered by social insurance schemes)—see Assaad and Mahmoud (2024) for an analysis of the sectoral characteristics of jobs. Our findings also highlight that almost a quarter of unemployed individuals have strong computer skills. Therefore, investments in digital-intensive sectors would tackle two birds with the same stone. First, it would provide potential employment opportunities for individuals with strong computer skills who are seeking and queuing for jobs that match their skills. Second, it would expand sectors likely providing formal jobs that can represent an employment source for women. These sectors are ICT; financial activities; professional, scientific, and technical activities (namely legal and accounting); and the manufacture of pharmaceuticals. It is worth noting that investing in ICT and business services, along with the manufacture of pharmaceuticals, would also provide a potential opportunity for boosting Egypt's exports.

Expanding technology adoption to other digital-emerging sectors, namely education and health.

Education and health are two sectors that are relatively less intensive in technology adoption but would greatly benefit from the use of technology in raising the quality of their services. Particularly, investing in the education sector is mandatory to cope with the rapidly emerging new forms of technology, including AI. Mainstreaming digital skills at all levels of education is a necessary

step, in parallel with raising the quality of education in basic literacy, mathematics, and statistics to enable Egypt to reap the benefits of the global digitalization trend (Selwaness et al., 2023).

Promoting and supporting digital entrepreneurship

The surge in internet usage among own-account work reflects the expansion in digital entrepreneurship and growing online activity. It is necessary to adopt policies to support and sustain such an expansion in terms of improving the business environment and access to finance for own-account workers (Assaad et al., 2019). Measures to improve the business environment should focus on making tax payments easier and more predictable (Selwaness et al., 2023). There are some recent reforms in this regard (Rizk, 2023); for example, an e-commerce unit was created within the Tax Authority to incorporate digital businesses into the tax system in 2020. In 2021, Executive Regulation No. 89/202 required small-scale social commerce businesses, like those selling on social media, to register with the Tax Authority, open a tax file, and pay income taxes. Taxation is governed by the Income Tax Law, Value-Added Tax (VAT) Law, and Unified Tax Procedures Law. Earnings under EGP 15,000 annually are tax-exempt but still require registration, while earnings over EGP 500,000 annually are subject to VAT. Taxes are determined based on income reviews by the Tax Authority (Rizk, 2023). These reforms prompt the need for examining and assessing the ease of registering businesses with the Tax Authority and the predictability of these tax payments, as well as the impact of such multiple taxation laws (income tax and VAT) on the performance of these businesses.

Investing in measurements of work through digital platforms

As digital platform employment is an emerging and non-standard form of work, there are difficulties and divergences in measuring its extent (ILO, 2023; OECD et al., 2023). The 2023 wave of the ELMPS represents an initial effort to estimate the number of digital platform workers. It is necessary for Egypt to continue investing efforts in the measurement of digital platform work to further understand its characteristics and explore areas of opportunities and challenges related to this work to inform policymaking. One important area of opportunity related to gig-based work is how to adapt social insurance schemes to include workers through digital platforms, but also digital own-account workers (Rizk, 2023).



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